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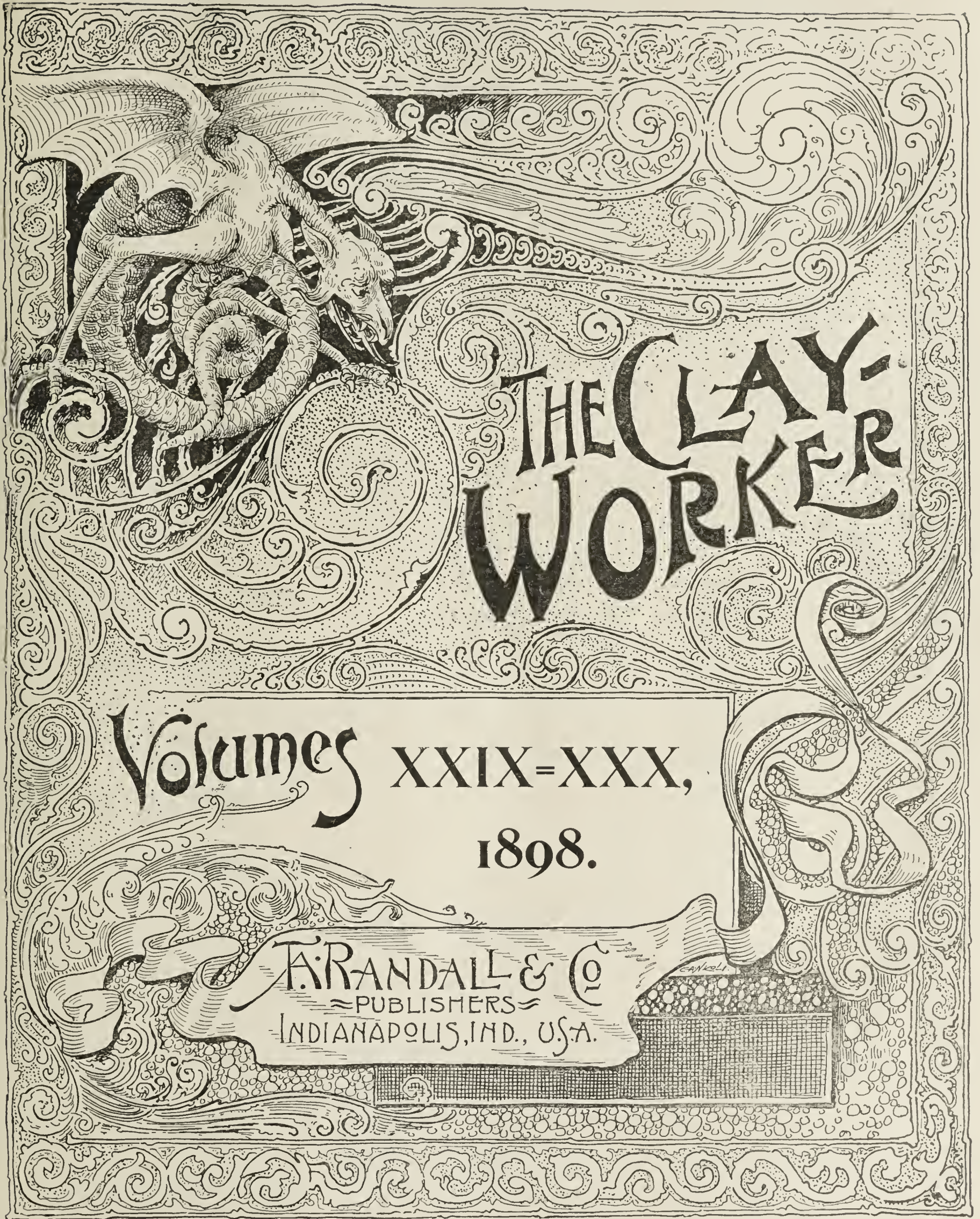
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REMOTE STORAGE



INDEX TO THE CLAY-WORKER.

VOLUME XXIX.

FROM JANUARY, 1898, TO JUNE, 1898.

A.

Advantage of Tile Drainage.....	36
Advantage of Large Tile Drains, The....	38
After the Next Convention.....41, 126, 154a	
An Example Others Might Follow with Profit	48
Annual Meeting National Association of Stove Lining Fire Brickmakers.....	49
Among St. Louis Brickmakers....54f, 164, 262	
Annual Powwow, The	154b
Address of Mr. Robinson.....	154b
An Artesian Well Spouts Clay.....	166
All Together at Pittsburg.....	158
Anglo-American Pottery.....222, 420, 512	
American Imports and Exports of Brick and Clay....	331, 538
Artistic Education of the Potter, The....	411
Art School at Trenton, The.....	419
"Any Color so It's Red".....	434
Artistic Education—Its Effects on Architecture	434
After a Big Government Contract.....	532

B.

Button Hole Talks.....19, 168, 229, 327, 521	
Burned Clay for Roads.....	28
Better Times in the South.....	47
Burned Clay as a Fire Proofing Material	107
Brickmakers' Accounts	132
Brickmaking in the Far Northwest.....	138
Brick Factory in a Wooden Town, A....	
.....227, 330, 515	
Brickyard Sketches	228, 321
Brickmaker's Education, A.....	231
Brickwork Fireplace, A.....	234
Brickyard Experience	235
By the Light of the Kiln Fire.....509, 239	
Benefits of Convention Work, The.....	250
Brick in Boston	256
Brickmaker, Know Thyself and Thy Neighbor Too	342
Burned Clay—Protection from Fire.....	356
Brick Setting and Burning in Down-draft or Up-draft Kilns.....	358
Brick vs. Wooden Buildings.....	343
Brick Fence, A	403
Buckeye Brick and Tile Plant, A.....	415
Brick and Business in the District of Columbia	431
Brickmaker Builds a Frame House, A....	427
Building Outlook, The	433
Brickyard Property Brings a Big Price.....	517
Brick History	531

C.

Chicago to Pittsburg.....	45
Calendars for 1898.....	50
Continuous Kilns Their Salvation.....	49
Current Comment	51, 253, 345, 433, 530
Committee on Revision of By-Laws.....	141
Ceramic Association of the Ohio State University, The	155, 168, 406, 504
Chambers Bros. Co.'s Exhibit at the Pittsburg Convention	159
Convention Echoes	154g, 156
Charming Picture, A.....	227
Congratulations from a New Member.....	249
Contractor's Troubles	255
Convention Aftermath	260
Convention Culls	333
Canadian Tariff on Clay Products.....	358
Confidence and Prosperity Again Doing Business in Iowa.....	328
Convention Profitable Even at Long Range	333
Congratulations from a Fellow-sufferer.....	426
Continuous Kilns and the Convention.....	428
Clay Fire-proofing	433
Clayworking in Denmark.....	498
Challenge Conveyor, The.....	516
Canton Pavers	524
Croaker, The	533

D.

Does Not Saltpetering Injure Salmon Brick as Much as Frost?.....	117
Does the Use of Oil as a Fuel Increase the Fire Hazard?.....	122
Drying Brick in Kiln by Use of Heat from Cooling Kiln.....	122
Distribution Sheet of the Blank Press Brick Co....	135
Does it Pay to Cover the Top of an Up-draft Kiln with Earth?.....	141
Does Age, When in Use, or When Under Cover and not Exposed Directly to the	

Weather, Improve Brick in Resistance to Abrasion?	150
Disintegration of Clay by Frost, The....	229
Development of Hollow Block Manufacture, The	316, 408, 501
Down in Jersey	354
Desires the Co-operation of All Interested	350
Drain Tile Business Prospering, The....	425
Diverting History of John Gilpin, The....	505

E.

Editorial Notes and Clippings.....	
.....54d, 162, 264, 352, 452, 536	
Election of Officers.....	98
Economy of Brick Structures as Compared with Those of Wood.....	119
Experimental Work, Wise or Otherwise.....	127
Enameled and Glazed Brick.....	319
Editorial Briefs	347
Endless Open Pan Conveyor.....	518
Early Religious Architecture of America	532

F.

Four-year-old Sends Greetings.....	45
Fire at Collum's Brickyard, Philadelphia	54f
Friday's Excursion	154h
French Peasant Women Working American Brick Machines	168
"Father" Pike's Impressions.....	248
From Brickyard to Legislative Halls.....	343
Flag Goes By, The.....	432
Few Snap Shots of a Virginia Brick and Tile Works, A.....	506
From the Ashes	517
Failed to Convert Clay into Gold.....	516

G.

Good Combination, A	47
Gaseous Fuel in Kilns, etc.....49, 343	
Great Newspaper Building, A.....	217
German Notes	225, 520
Glad He Joined the N. B. M. A.....	248
Glazed Brick	250, 344
German Association Topics, The.....	256
Good Tidings from Canada.....	323
Good and Bad Brick Work.....	410
Good News Confirmed, The.....	426
Good News from Alabama.....	522
Galesburg Pavers, The.....	523
Genuine and Imitation Fire-proofing.....	531
Good and Bad Brick Pavements.....	532

H.

Heart of Pittsburg, The.....	11
How Can We Best Dull the Raw Edge of Competition?	35
Hollow Blocks—Their Advantage.....	37
Holiday Remembrances	50
Home Markets Again, The.....	48
How to Sandbag a Competitor.....	51
Have Continuous Kilns Proven Successful in Burning Face Brick?.....	115
How Much Water Can a Brick Absorb and Yet Be Safe from Frost Disintegration?	116
Have not Brickmakers Made a Mistake and Sacrificed the Artistic Effect by Too Close Shading for Color in Trying to Produce a Monotone Front?.....	118
How to Increase the Use of Brick.....	130
How Are Ornamental Brick Generally Burned in an Ordinary Dry-press Yard	142
How Can the Element of Noise in Brick Pavements be Obviated or Minimized?.....	152
Hollow Ware Sewers—A New Application of Hollow Block	230
Heroic Treatment	229
Handsome Book, A.....	254
Hints on Brickmaking.....322, 407, 514	
Hollow Block, Brick and Pipe Sewers.....	343
How to Make a Fortune.....	418
Had Nothing to Say.....	435

I.

Illinois Clayworkers' Convention.....	24
It Is All Sufficient.....	46
Influence of Organization, The.....	52
Iowa Convention, The.....	52
Is Drying Up-draft in a Down-draft Kiln an Economy?	140
Is Air Pressure as Good as Steam in the Use of Oil for Burning Brick?.....	142
Is the Standard Size of Common and	

Face Brick Adopted by the N. B. M. A. Generally Adhered to? If Not, What Further Can Our Association Do to Maintain the Standard?.....	143
Is Burning Brick with Producer Gas a Success in Europe? If so, Why Is It Not Introduced in the Country?.....	145
Is it Practicable to Make Gas from Bituminous Slack for Burning Brick?.....	146
Is it Best to Set Dry-press Brick in Kiln Direct from Machine, or Pass Them Through the Dryer, Economy in Drying and Quality of Brick Considered?.....	148
In Memoriam	154e
Impressions of the Convention by a New Member	154g
Impressions of the Convention.....	155
In and About Cleveland.....	164
I Was Never So Surprised in All My Life.....	158
In Philadelphia Brickyards.....225, 329, 405	
Inspection Waives Defects—Of Interest to Brick Contractors.....	226
Inventor's Diligence, The.....	236
Improvement at Toledo.....	266
Illustrating Uncle Sam's Wealth.....	234
Insurance, Fire and Adjustment.....	314
Insurance on Fire-proof Buildings.....	346
It's Keeping Everlastingly at It.....	356
In Troubled Waters.....	426
Information Through Private Correspondence	427

J.

Jeffery Steel Cable Conveyor for Slabs and Refuse	330
---	-----

K.

Kind Words for the "Steam Maker".....	249
Kept at Home by a Disastrous Fire.....	254

L.

Latch String Hangs Out, The.....	47
Look Ahead	52
Letters from Absent Members.....	97
Looking Forward	100
List of Members of the N. B. M. A.....	154d
Last the Best of All, The.....	154g
Local Organization	255
Labor Problem, The	345
Limitation of the Height of Buildings in Chicago	432
Let Your Light Shine	521
Light Ahead, Business Outlook as Viewed by a Chicagoan.....	522
Local Experience in Combination, A.....	532
Local Agents for Paving Brick.....	532
Look Ahead, A.....	540

M.

Modern American Front Brick.....	
.....21, 218, 312, 414, 507	
Mayor Taylor's Welcome.....	27
Mayor Ford's Welcome.....	95
Mayor of Allegheny Sends Greetings, The.....	120
Message from Over the Sea, A.....	132
Manufacture and Use of Press Brick in the South	144
Miscellaneous Business	154
Machinery Annex, The	154h
Move in the Right Direction, A.....	157
Milwaukee Brickmakers See Light Ahead.....	226
Manual for the Manufacture of Brick, A.....	235
Minnesota's Pioneer Sewer Pipe Factory.....	326
May Want a Dry Press.....	344
Making Marbles	516
May Make Pavers	519

N.

New and Old Brickmaking.....	32
New York Market....54b, 170, 253, 360, 429, 518	
New Departure, A	51
Noted Pittsburg Firm, A.....	154f
Nebraska Brickmakers' Convention, The	154f
New Dry Press with a Government Indorsement, A	166
New Ceramic Association, A.....	156
N. B. M. A. Badge, The.....	157
New Field for Convention Work, A.....	157
New Furnace for the Drying of Clays.....	221
New Inventions	236
New Combined Brick and Tile Machine.....	238
New Brick Exchange, A.....	327
Notes from Tidewater, Va.....	358, 450
New Explosive Especially Adapted to Clay Blasting, A.....	405

New Brick Cutting Table, A.....	425
Now for the Next One.....	429
Not Afraid of Spanish Shells.....	521

O.

Old China of France and England Bear- ing American Design.....	22
Official Announcement	44
Obituary—	
Death of James E. Dingee.....	46
Death of Wm. H. Bennett.....	254
Death of E. H. Lonsdale.....	254
Death of F. D. Cumber.....	519
Death of A. M. Booker.....	353
Opening Prayer, The	95
Observations of an Old Time Member.....	248
Ohio Valley Clay Works Afloat.....	331
Old John	413

P.

President's Annual Address.....	27
Pacific Coast News.....	541, 172, 266, 454, 538
Paste it in Your Hat.....	51
President Brush's Address.....	96
Proposed Revision of By-Laws.....	139
Purinton, D. V., as a Lecturer.....	154c
President's Address, The.....	156
Pleasant Memories and Bright Anticipa- tions	342
Philadelphia's Oldest Clayworking Es- tablishment	406
Profiting by Experience.....	428
Prospects for Good Business.....	498
Painting Brick Work	510
Philadelphia Pavers	524
Purpose Essential to Success	525
Prompt Deliveries	531

Q.

Question of the Hour, The.....	256
Questions About Paving Brick and How to Lay Them	511

R.

Report of Committee on Resolutions.....	42, 154
Refractory Qualities of Clay, The.....	110
Reducing Conditions in Burning, A.....	114
Report of Committee on Technical In- vestigation	147
Report of the Executive Committee.....	154

Report of Committee on Resolutions.....	154
Return Traps for Steam Dryers.....	263
Rocking Grates for Steam Boilers and Kilns	251
"Right Wrong" in Burning Brick.....	252
Red Press Brick	404
Remedy for Cracking Brick.....	428
Raw Clay Roads	525
Read the Advertisements.....	506

S.

Spirit of Decatur, The.....	52
Social Amenities	140
Soft Mud Brick	144
Social Feature, The	157
Simple Method of Making Decorative Brick, A	235
Staining Brick	268
Suggestions for Future Work.....	248
Since Dad Started in Making Brick.....	257
Success	315
Solution of the Labor Problem.....	323
Sight-seeing Under Difficulties.....	350
Spring Meeting of the National Stove Lining Manufacturers' Association.....	418
Seashore Brick Plant, A	429
Sunshine and Shadow.....	426
Story of the Old Brick Fort, The.....	499
Second Annual Contest for the N. B. M. A. Scholarship	520
Situation in Chicago, The	523

T.

Tile Drainage as an Investment.....	30
Tilemaker's Dream, The	34
Tribulations of a Brickmaker.....	39
Trip to the Brickyard, The.....	43
Turning Over a New Leaf.....	51
Take a Fresh Start.....	52
Trade Literature	53, 346, 434
Twelfth Annual Convention of the N. B. M. A.	95
Treasurer's Report	97
They All Had Windows.....	156
Trade Notes and Comment.....	260
Testing Sewer Pipe in Melbourne, Vic- toria	311
Try Water	344
Traveler's Notes, A	344
Terra Cotta in Architecture.....	416, 495

Terra Cotta Man's Hopes and Fears.....	426
Trade Notes	435
Too Generous by Far.....	519
"The Simplest and Best Brick Ma- chines"	538
To Gates	533

U.

Use of Electric Tramways in Hauling Clay, The	106
University Scholarship, The.....	157
"Union" Brick Machines.....	328
Use and Abuse of Clayworking Machin- ery, The	332, 450, 519

V.

Valuable Point, A	20
Value and Advantages of the Conven- tion, The	38
Very Profitable Meeting, A	228
Value of Government Statistics.....	237
Very Bad Habit, A.....	224
Voice from Texas, A.....	510

W.

Wear and Tear of Clayworking Machin- ery, The	40
Well-known Machine Man Caned.....	541
Will Any Salmon Brick Withstand Ex- posure to Freezing?.....	115
Why do Some Brickmakers Live in Wood Houses?	129
What Is the Best Metal for Making Dies for Ornamental Brick.....	144
Which Is the Best Way to Set and Burn Fire-flashed or Impervious Face Brick?.....	146
Will an Iron Stack Do as Good Work on a Continuous Kiln as a Brick Stack.....	149
We Stand Corrected.....	250
We Bow to Him	257
What Does Your Brick Cost You?.....	342
With the Philadelphia Brickmakers.....	356
What's a Fair Royalty?.....	358, 430, 426, 523
What Is Electricity?	320
Want T Rails and Dump Cars.....	328
Well-deserved Success	424
Wants His Buttonhole.....	426
Wants It Oftener	429
With the Brickmakers of Baltimore.....	522
Wanted—Paving Brick Missionaries.....	531

VOLUME XXX.

FROM JULY, 1898, TO DECEMBER, 1898.

A.

Artificial Pottery Bodies	10
Anglo-American Pottery	15, 106, 192, 276, 353, 448
An Illinois Brick and Tile Plant.....	111
Affairs at the Columbus School of Clay- workers	119
Around the World	118
Among the Brickmakers of Philadelphia and Vicinity	196
Another View	202
Actions Speak Louder Than Words.....	275
An Improved Sewer Pipe Press.....	282
Asphalt Engineering	297
Art Preservation, The	283
At Christmas Time	447
Advantage of Brick Compared with Frame Buildings	453
An Invitation to the National Conven- tion	460

B.

Button-hole Talks	12, 111, 187, 262, 346, 441
Brick Factory in a Wooden Town, A.....	16, 29, 197, 272, 355, 450
Brick and Asphalt Pavements.....	18
Brick vs. Asphalt in Small Cities.....	20
Burning Questions, The	26
Brickyard Sketches—	
Sheridan Brick Works.....	29
Marion Brick Co.'s Works.....	270
Works of the Ohio Mining and Manu- facturing Co.	439
Brick at National Capital.....	44
Brickmaking in North Dakota.....	45
Business Straws	47
Brick Pavements Growing in Favor.....	48, 131
Brick Pavements in Chicago.....	48
Binding Effect of Retaining Statement of Account	17
Brickmaking on the Hudson.....	110
Brick Pavements for Small Cities.....	112, 188
Brick and Asphalt Paving at Minneapo- lis	114
Brick vs. Frame Buildings.....	120, 130
Brick Pavements	130
Brick Paving in Des Moines.....	190
Battenfield-Morgan Co., The.....	203
Brick Plants at Texas, The.....	202
Business	212
Buff Clay Wanted	197
Brick Masonry	269
Business Proposition, A	278
Baltimore Brickyards	280

Busy Times for Brickmakers in Clevel- and	284
British Fire Prevention Committee and Its Work	296
Brick Paving and Fillers.....	348
Believe in Yourself First	356
Be Neighborly in Business.....	362
Brickmaking in Cumberland, Eng.....	432
Brickyard Construction	451
Brickmaking Under Difficulties.....	460
Brick Business Improving in Oregon.....	460
Brick Pavements	462
Busy Concern, A	464

C.

Clayworking in Turkey	9
Clays and Clay Industries of Northwest- ern Indiana, The	13, 108, 178
Clay Products at the Great Omaha Expo- sition	45
Cheap Labor Often Means Dear Labor..	47
Current Comment	47, 130, 212, 295, 380, 462
Clays of Indiana, The	48
Clays and Clayworking Industries of North Carolina	49
Cost of Ammunition, The	107
Clay in Architecture	177
Clayworkers at the Illinois State Fair.....	199
Cost of Terra Cotta and Stone.....	212
City's Liability for Bad Brick in a Side- walk, A	224
Ceramic Department of the Ohio State University, The	279
Ceramic Association's New Officers, The.....	297
Clay Cast Like Iron	285
Century Run, A	297
Capital Brick and Mortar.....	346
Cement-Macadam	350
Clay Boards	350
Clayworking in Greece.....	357
Convention Time	380
Clay, Art and Architecture.....	382
Children of Earth, The	384
Clayworkers' Conventions	386
Ceramic Association, Ohio State Univer- sity	451
Clay Industries of the Eastern Countries of Europe, The	452
Christmas Greetings from Philadelphia.....	457
Christmas Thoughts for Brickmakers.....	462

D.

Development of Hollow Block Manufac- ture	33, 100, 182
Down in Jersey	30

Do Paving Brick Receive Fair Treatment from the Engineers?	115
Don't Know it All.....	102
Dry or Semi-dry	202
Difficult Question, A	296
Does the Size of Particles Have Any In- fluence in Determining the Resistance of Fire Clays to Heat and to Fluxes?	445, 461

E.

Editorial Notes and Clippings.....	52, 132, 222, 298, 388, 470
English China Clays	96
Efflorescence of Brick	105
Editorial Briefs	119
Exit the Potter's Wheel.....	383
Ex-President McAvoy Sends Greetings from the Summit of the Rockies.....	379

F.

Fire-resisting Materials and Their Use in Construction, etc.	27
Fire Limits	48
From the Ashes	46
Fitting Use for Terra Cotta, A.....	93
From Over the Border.....	121
Fillers for Brick Pavements.....	191
From Brickyard to Bar.....	279
From Employee to Proprietor.....	297
Fire-proofing	297, 365
Food for Thought	382
Fourteen Years of Success.....	463

G.

Great Fuel Saver, A	198
Good Roads	269
German vs. American Methods.....	282
Golden Rules for Merchants and Manu- facturers	264
Good News from Denver	378
Good Place to Grow Up, A.....	382

H.

Hints on Brickmaking	94, 178
Hand Re-press, A	199
Home-coming Soldiers, The	213
How Lo Makes Bricks	265
How Can We Promote Brick Structures?.....	378
Ho for Columbus	461

I.

Its of the Roofing Tile Business, The....	46
Italian Claydiggers Kick at Winslow, N. J.	103

Importance of Good Foundations.....	189
Invitation to the Peace Jubilee, An.....	297
In Philadelphia Brickyards	364
Importance of Good Foundations, The.....	381
Illinois Convention City, The.....	458

J.

Jarden Brick Co., The	364
Jonah Coughed Up Again.....	446

K.

Know that the Ad in the Clay-Worker Does Too Much Good to Leave it Out Once	121
---	-----

L.

Legal Standard for Paving Brick.....	194
Labor Problem, The	296
Lessons of a Great Fire	454

M.

McAvoy Vitrified Brick Co., The.....	23
Modern American Front Brick.....	24, 97, 185, 263
Making Brick Way Down in Maine.....	118
Manufacturing Slag Brick in Russia.....	184
Making Brick in Mexico	195
Mineralogists Make a Discovery.....	197
Milwaukee Brick Market, The	216
Mammoth Monmouth Jar, A.....	216
Making Brick in Far-away India.....	285
Modification of Bischof's Method of De- termining the Fusibility of Clays, A.....	366
Morrison, R. B., Seriously Ill.....	380

N.

New Hand Press, A	44
No Bonus for New Brickyard	45
New York Market, ...	50, 138, 200, 304, 392, 456
Notes by the Way	54
Noise of Pavements	48
New Clay Screen, A.....	118
Now for Peace and Plenty	131
No Cause for Alarm.....	94
New England Klondike, The	218
New Enemy, A.....	213
National Quarantine	279
New Haven News	284
No Sweating, No Swearing	294
Name or Man, The	386
New Architecture, A	381
New York Fire, The.....	463

O.

Old Glory	49
Obituary— Death of Albert H. Winslow.....	95

Death of William Waplington.....	119
Death of Theodore Fredericks.....	281
Death of Ira L. Otis.....	281
Death of Hector McLean.....	281
Death of Joseph Joiner.....	365
Ohio School for Clayworkers, The.....	187
Official Announcement	368, 456
"Old Post," The	369
Ohio Valley News	455
Our Holiday Greetings	462

P.

Prosperous Yankee Community, A.....	31
Pacific Coast News.....	56, 224, 306, 379, 472
Perkiomen Brick Plant	117
Paving Brick Plant Sold at Auction for \$300,000	119
Paving Brick Business Good in Western Pennsylvania, The	121
Portable Chain Elevator	201
Peoria Gets the Next Convention.....	224
Paving Brick in New York City.....	266, 350, 434
Paving Brick in St. Louis.....	268
Promise Something Good.....	294
Pavement Guarantees	284
Paving Brick in Large Cities.....	295
Paving Brick for Building Purposes.....	345
Philadelphia Brick Machinery in China.....	348
Plastic Brickmaking in England.....	360
Programme Illinois Clayworkers' Asso- ciation	363
Paving Brick Trust, The	380
Paving Brick and How to Lay Them.....	381
Passing of Joseph Joiner.....	381
Paving Brick Notes at Kansas City.....	438

Q.

Quick Motion and Hot Coffee.....	384
----------------------------------	-----

R.

Results of Overwork.....	14
Romance of Aluminium, The	140
Relative Value of Coal and Wood as Fuel	181
Results, The	213

S.

St. Louis Notes.....	50, 138, 203, 304, 392, 449
Slow-burning Construction	48
Selecting Drain Tile	58
Spanish-American War and the German Clayworking Industries, The	95
Some Results of the War.....	131
Social Brickmakers	181
Situation in Chicago, The.....	218, 285, 379

Safety of Railroad Travel, The.....	186
Season in Maine, The	283
Statistics of Clayworking	295
Story of an Invention, The.....	367
Slate and Shale	368
Street Paving in Dayton, O.....	436
Some Good Things	459

T.

Tile Trade Improving, The	46
Thunder Bird, The	103
Two Good Plants Under One Name.....	116
Texas Wants a Paving Brick Plant.....	120
To Button Hole or Not to Button Hole.....	121
Taking a New Stand.....	131
Tour of Scotland, A.....	180
Trade Journal, The	185
Terra Cotta Fronts	261
Trade Notes from Zanesville, O.....	300
Trade Literature	297
Turning Large Pots by Machinery.....	363
Thanksgiving Day	380
Tile Floors	463

U.

Use and Abuse of Clayworking Machin- ery, The	294
Utility and Art in Clay.....	431
Up On the James River.....	445

V.

Virginia Brick and Tileyard, A.....	104
Veneer Houses	212

W.

Wages and Prices	22
Words of Cheer and Sympathy.....	45
Working Nights	46
Which Is the Best Dryer?.....	120, 202
Whitewash and Finger Marks.....	120
War Over, The	151
Washington News	140
Why Mr. Hensley Looks Pleasant.....	203
Why Not Terra Cotta Monuments.....	202
When Reuben Quit	214
What Kiln Shall I Build?	273, 358, 442
Wants a Small Brick and Tile Plant.....	378
Wire-cut vs. Molded Brick, An Inquiry.....	378
What We Learn from Other Trades.....	382
With Milwaukee Brickmakers	463

Y.

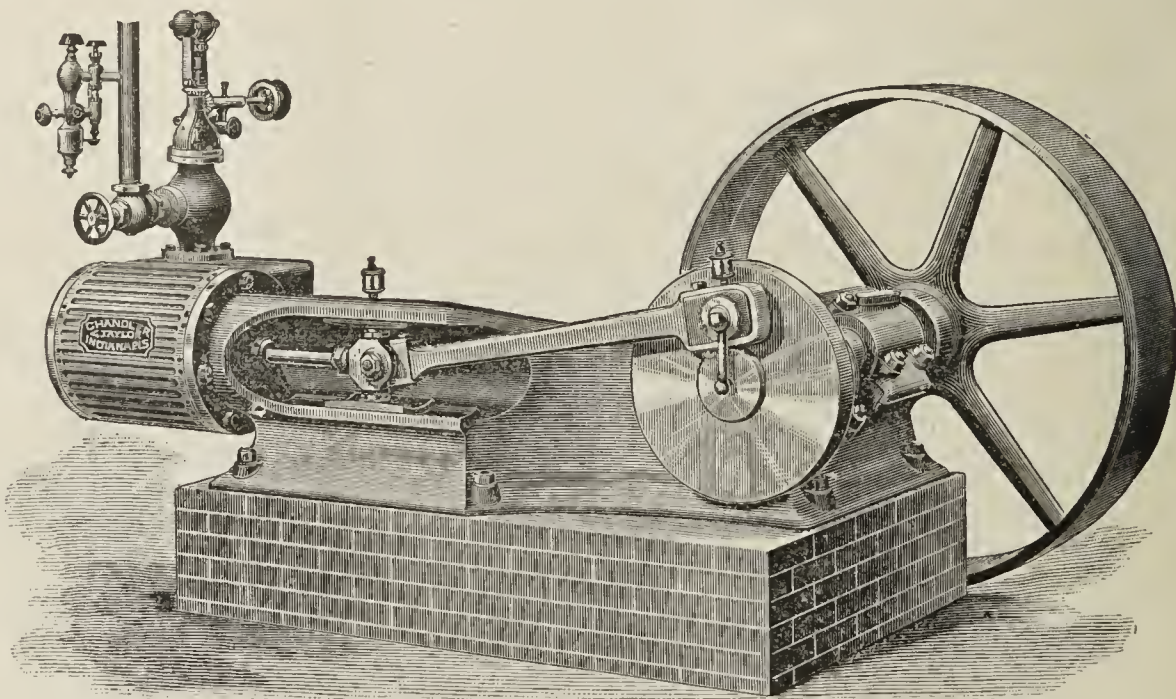
Yellow Journal, The.....	213
Yellow Journalism	213

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Vol. XXIX, No. 1.

INDIANAPOLIS, IND., JANUARY, 1898.

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MESSRS. CHAMBERS BROS. CO.,
Philadelphia, Pa.

Gentlemen:—The Side Cut Brick Machine that you sold us last Spring is giving entire satisfaction, both as to quality and quantity of brick we are making on it.

We are now making first-class brick out of clay that the machine yours replaced would not work.

Wishing you success, we are,
Very truly yours,
THE MILL HALL BRICK WORKS,
Geo. O. Salmon, Supt.

THE JACKSONVILLE BRICK CO.

JACKSONVILLE, FLA., Nov. 5, 1897.

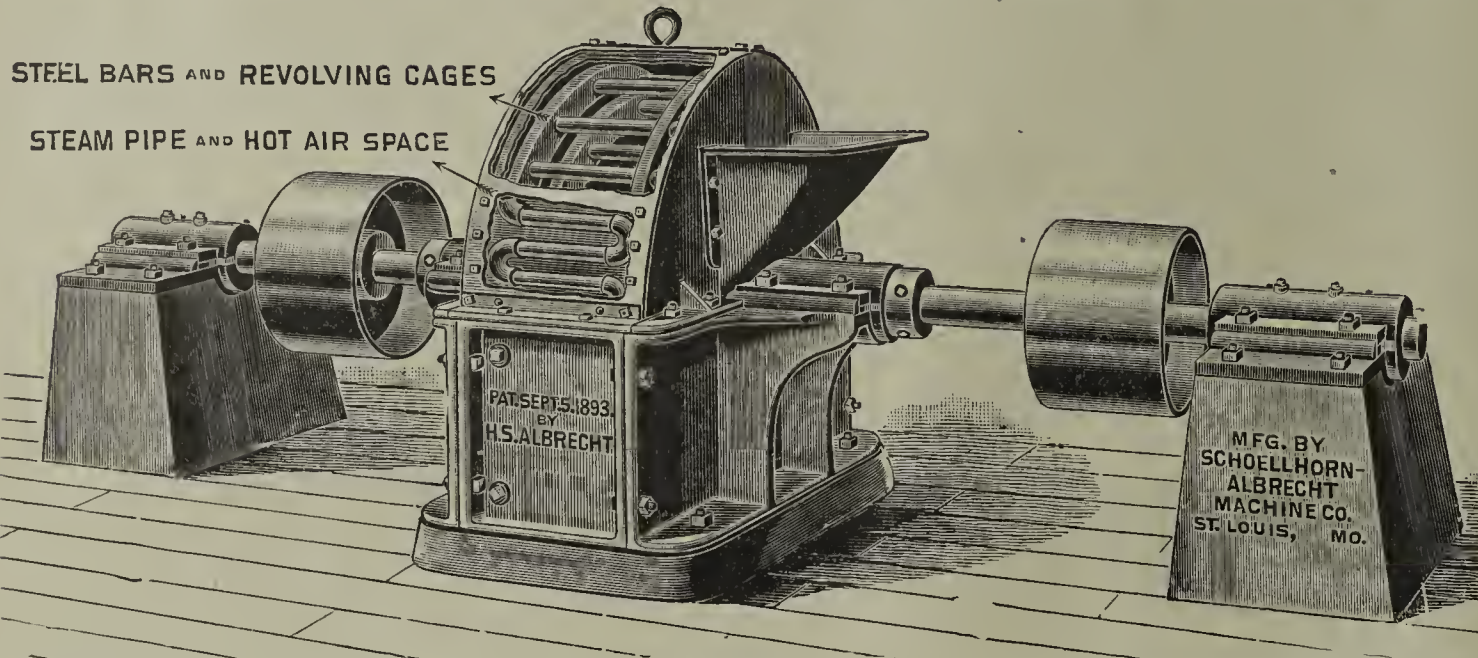
CHAMBERS BROS. CO., Philadelphia, Pa.

Gentlemen:—We are pleased to state that we are using your No. C-CD machine in our plant, and it is giving us perfect satisfaction; we make 40,000 brick per day with ease. The repairs during the three years have been very small in comparison with those required by other machines with which we have had experience.

Taking everything into consideration, we think the "Chambers" a success.

Very truly yours,
THE JACKSONVILLE BRICK CO.,
By W. Moore Angus.

Patent Disintegrator.....



FOR PUL-
VERIZING
COMMON
CLAY,
FIRE CLAY,
SLATE,
PAINT,
BONES,
FLINT AND
ORE OF
EVERY DE-
SCRIPTION.

THE SIZES AND PRICES OF DISINTEGRA-
TORS ARE AS FOLLOWS:

12-inch diameter,	-	-	each	\$200
13 "	"	"	"	300
24 "	"	"	"	400
30 "	"	"	"	500
36 "	"	"	"	650
40 "	"	"	"	800
48 "	"	"	"	1,000
60 "	"	"	"	1,600

— WRITE FOR DISCOUNTS.

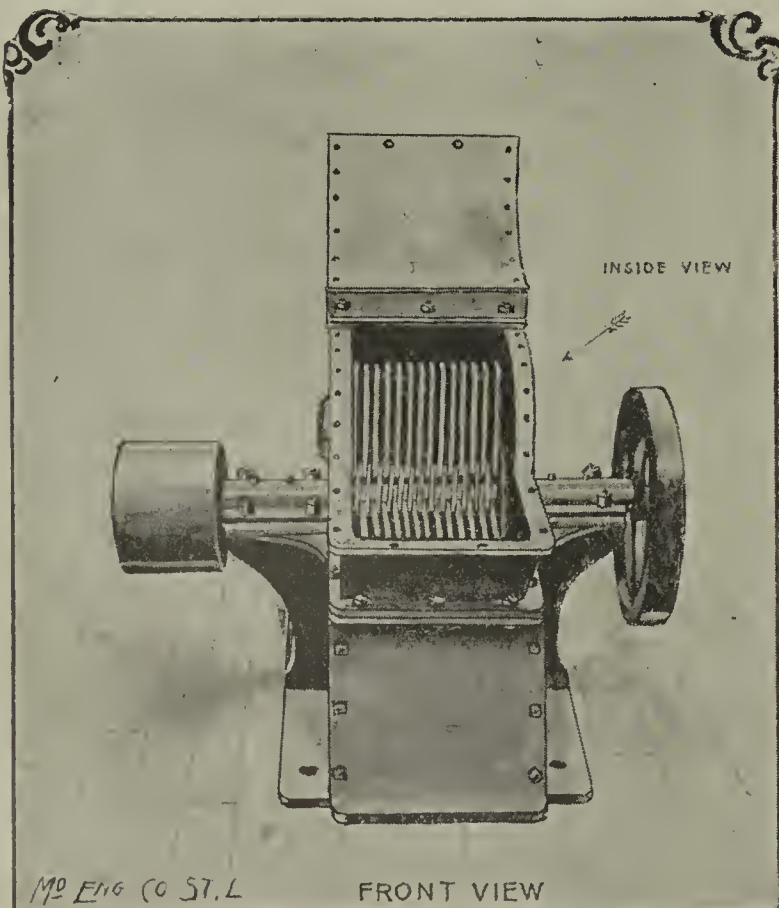
PARTIES DESIRING TO PURCHASE THESE MACHINES will please state for what purpose mill is desired, and same will be built according to the work required of it, as different materials require different construction of the steel bars on the inside.

We have a number of these Disintegrators in use on different materials, and all are giving entire satisfaction.

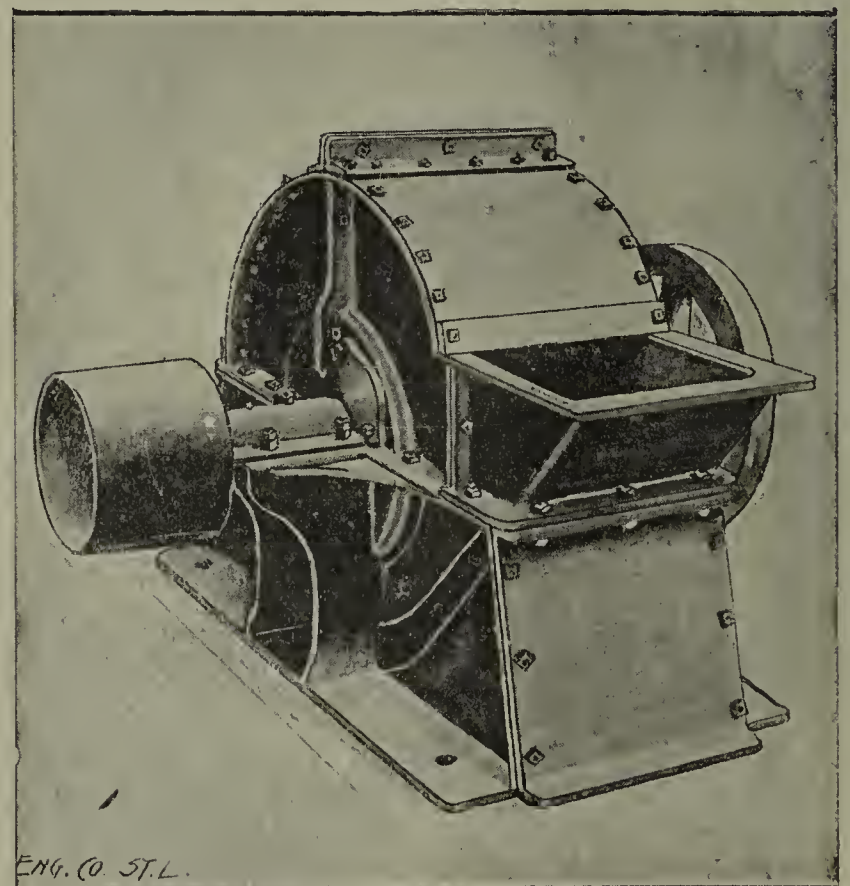
Schoellhorn-Albrecht Machine Co.,

609 and 610 North Levee and
616 and 618 North Commercial St., ST. LOUIS, MO.

NEW IMPROVED PATENT BREAKER AND PULVERIZER.



EXCEL IN CAPACITY AND DURABILITY.



THE SIZES AND PRICES OF DISINTE-
GRATORS ARE AS FOLLOWS:

24-inch diameter, each	-	-	\$	500
30 "	"	"	"	650
36 "	"	"	"	850
40 "	"	"	"	1,000

Write for Discounts.

THESE MACHINES break and pulverize clays and materials of all kinds to an absolutely fine powder. They are far superior to anything of the kind in the market, being provided with our patent self-oiling dust-proof boxes, they can be run at a much higher speed than any others. For full particulars, testimonials, etc., write the

ST. LOUIS PULVERIZER CO.,

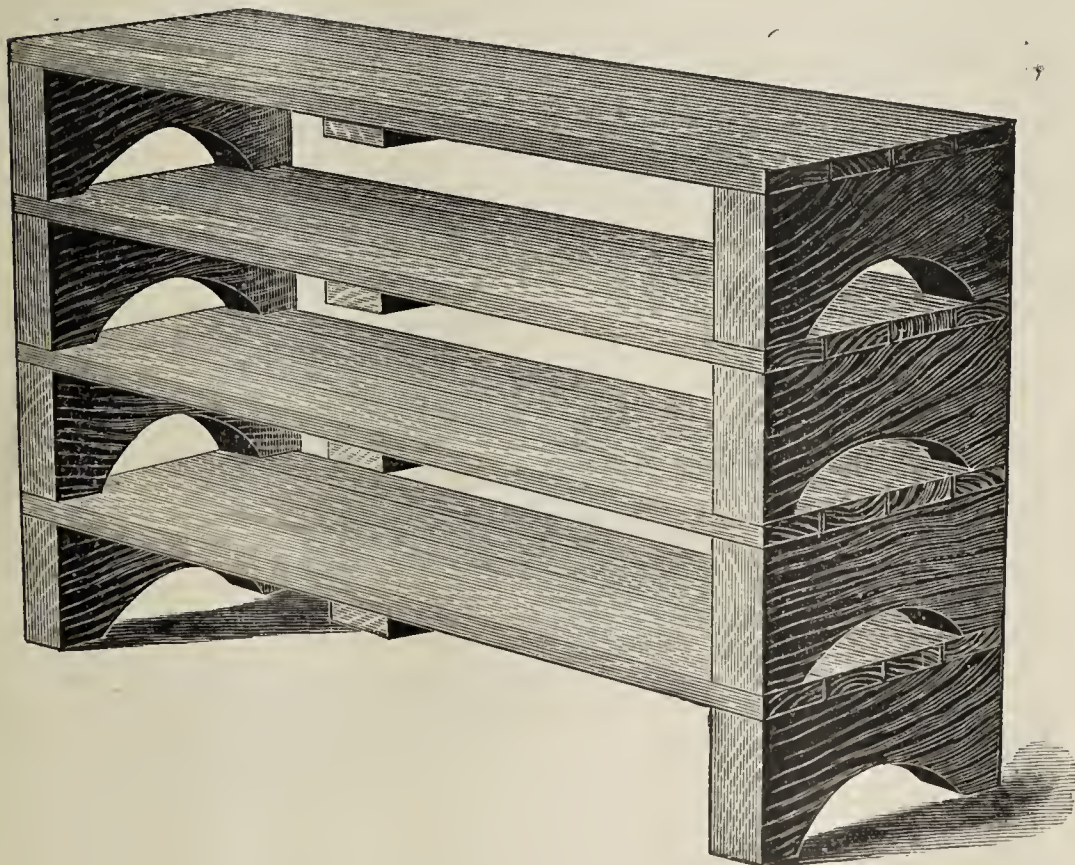
Patentees and
Manufacturers

616 N. Commercial St., ST. LOUIS, MO.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also *Decks for Dry Cars.*

We can ship them anywhere.

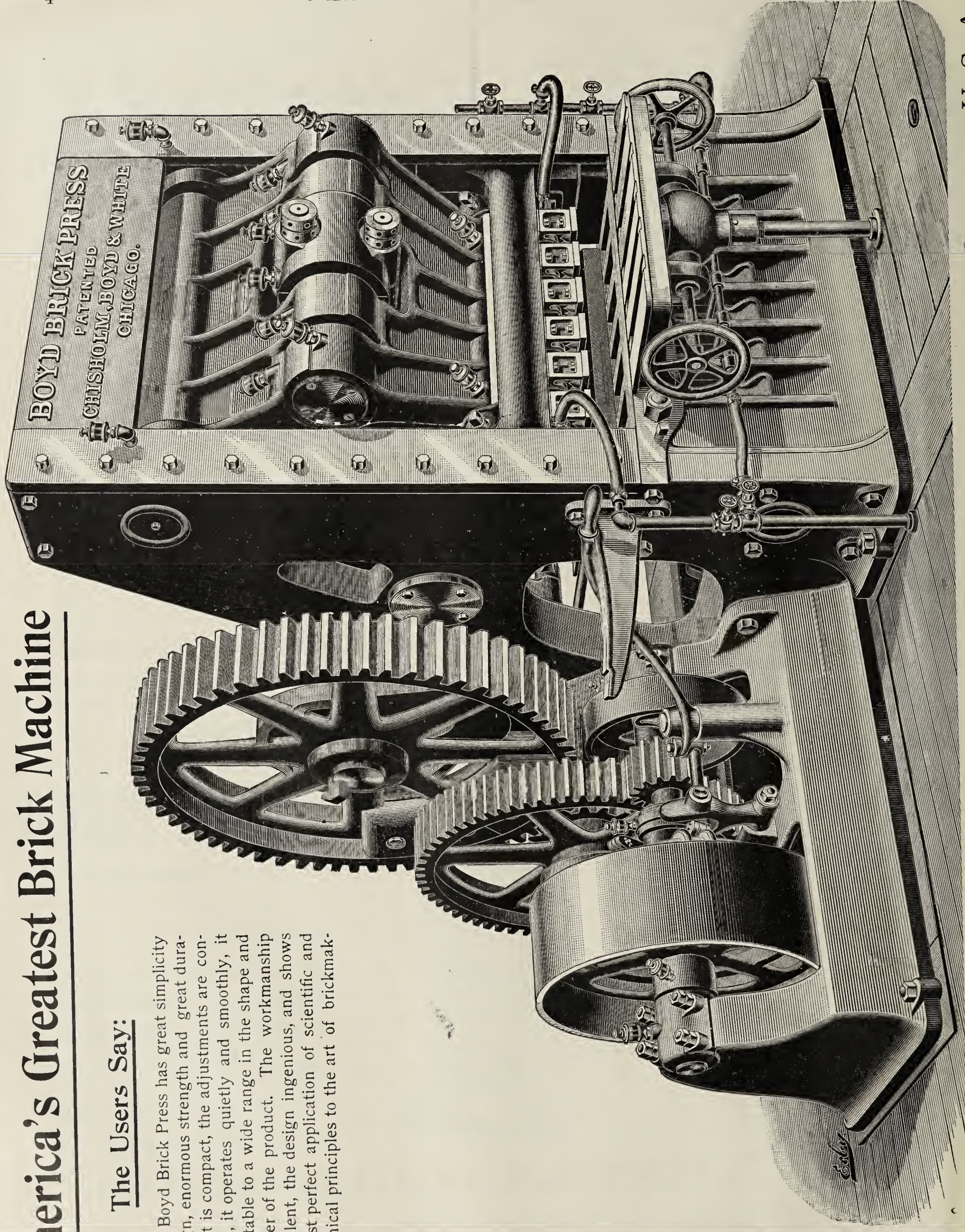
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

Success for the Brickmaker.

A BRICK PLANT

Equipped with our machines and system is universal in its work, and will produce at lowest cost per thousand, common building brick and fire brick, as well as high-grade front or face brick.

NOT THEORISTS.

We are not theorists. We are practical business men—engineers in our profession. We have made a success of our business by making success for our customers. The Brick Plants designed, equipped and started by us are living monuments of our success. The Boyd Presses sent on trial have always enhanced our good name and remained to charm our customer.

WHERE ARE YOU?

If the Brick Machine Maker won't guarantee you satisfactory burned brick from your material, don't you think you better find some other machine man who will do so, or else abandon the enterprise? Surely there's danger some where, and the machine man knows it. If he gets cash or notes for his machine he's safe, but where are you?

A STRAIGHT OFFER.

The Boyd Brick Press will be placed upon the yard of any responsible firm on trial, and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the brick shall be satisfactory after being burned.

Pressed Brick, Fire Brick, Paving Brick, Common Brick.

A....
SURE
THING

FOR
BRICKMAKERS.



We will construct and equip a Brick Plant of any capacity desired, for any responsible party, furnishing Brick Machines, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of Brick, and turn the Plant over to him in proper working order, under guarantee of satisfactory results as to quality of product and cost per thousand; the loss to be ours in case of failure.

CHISHOLM, BOYD & WHITE CO.,

OFFICE AND WORKS:
57th and Wallace Streets.

CHICAGO.

CLAY WORKING MACHINERY

The Simpson Brick Press, The World's Standard.

Used by the most successful brickyards throughout the United States and Canada.

We manufacture a complete line of Clay-working machinery.

Do not experiment. Invest your money in a **SURE THING**.

Complete plants constructed and guaranteed. Write for catalogue.

The Simpson Brick Press Co.,

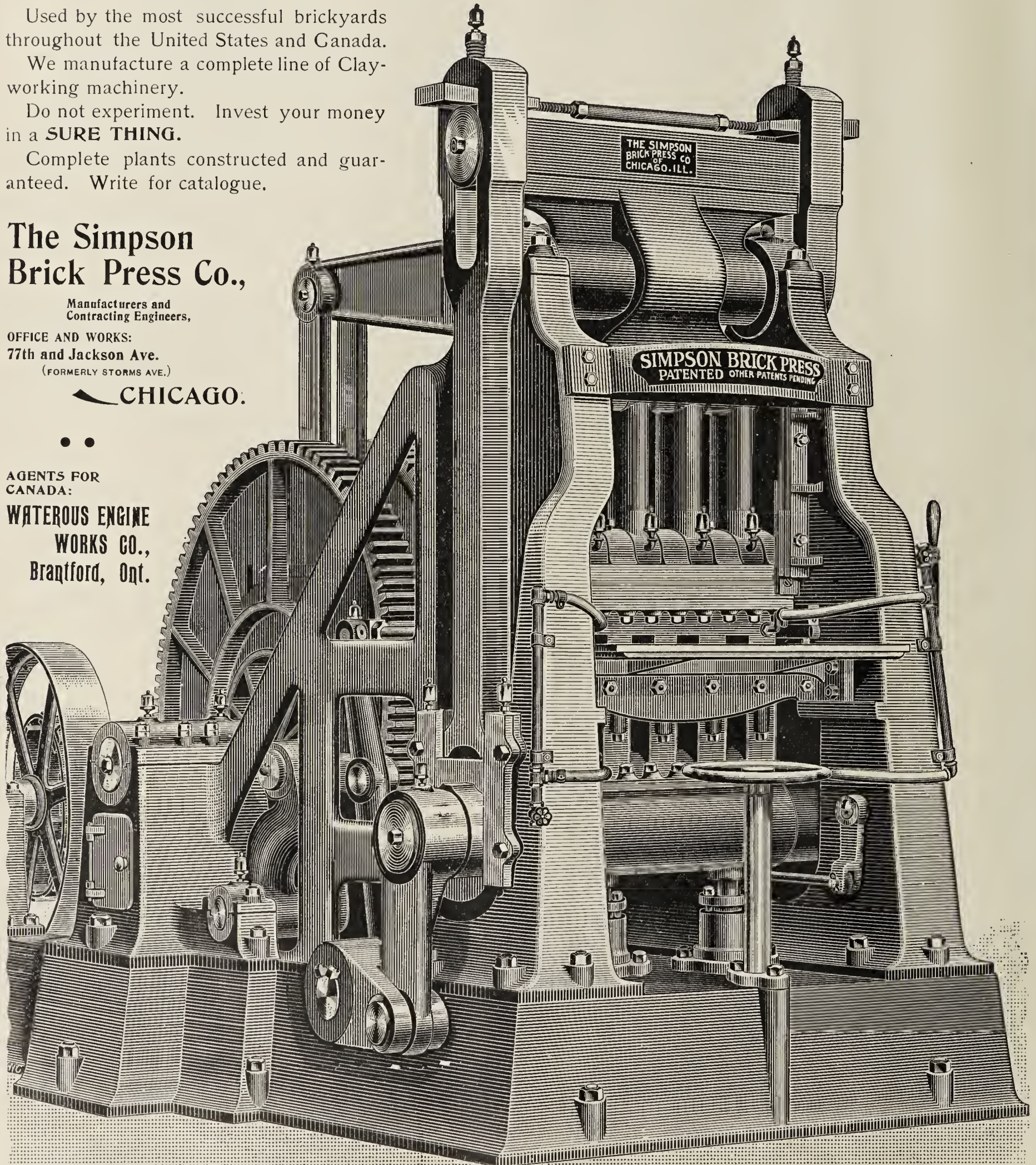
Manufacturers and
Contracting Engineers,

OFFICE AND WORKS:
77th and Jackson Ave.
(FORMERLY STORMS AVE.)

CHICAGO.

AGENTS FOR
CANADA:

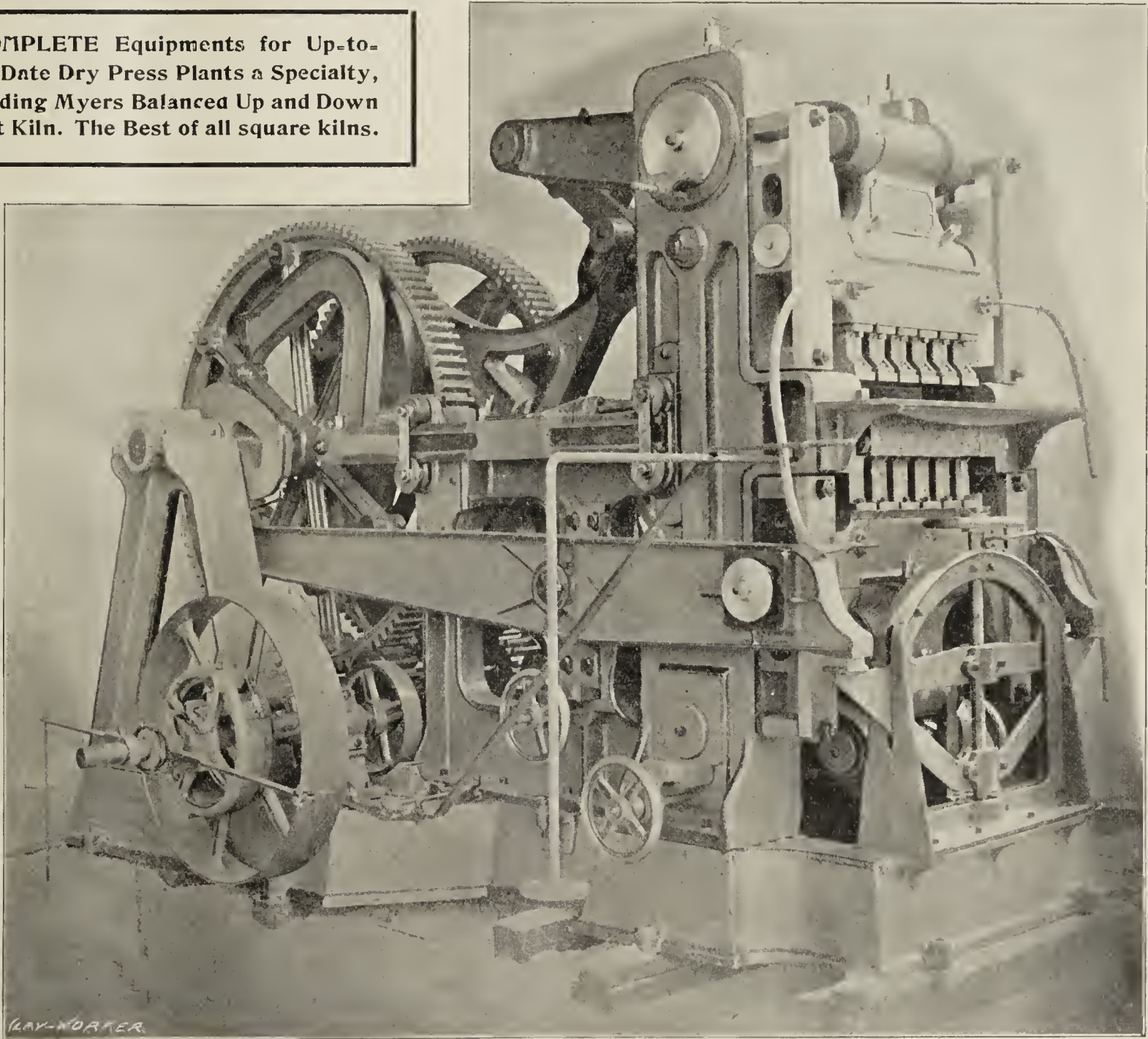
WATEROUS ENGINE
WORKS CO.,
Brantford, Ont.



The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments for Up-to-Date Dry Press Plants a Specialty, including Myers Balanced Up and Down Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

ST. LOUIS, MO.

"A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

...

THE accompanying letter from the largest brick-making concern in the World is worthy of serious consideration. The Hydraulic Press Brick Company never recommend a machine till they have tested it thoroughly and know it to be a COMPLETE SUCCESS.

...

Office of HYDRAULIC PRESS BRICK CO.,

St. Louis, Mo., October 30th, 1897.

Milton F. Williams, Esq., City.

Dear Sir:--Enclosed please find our order No. 125 for one No. 2 Pulverizer. In a few days, or as soon as our drawings are completed, I expect to give you an order for two more. We have three of your Pulverizers now running, giving perfect satisfaction. We are able to grind Clay to any degree of fineness by making very slight changes in the machine. They have been running several months without repairs worth considering.

Yours truly,

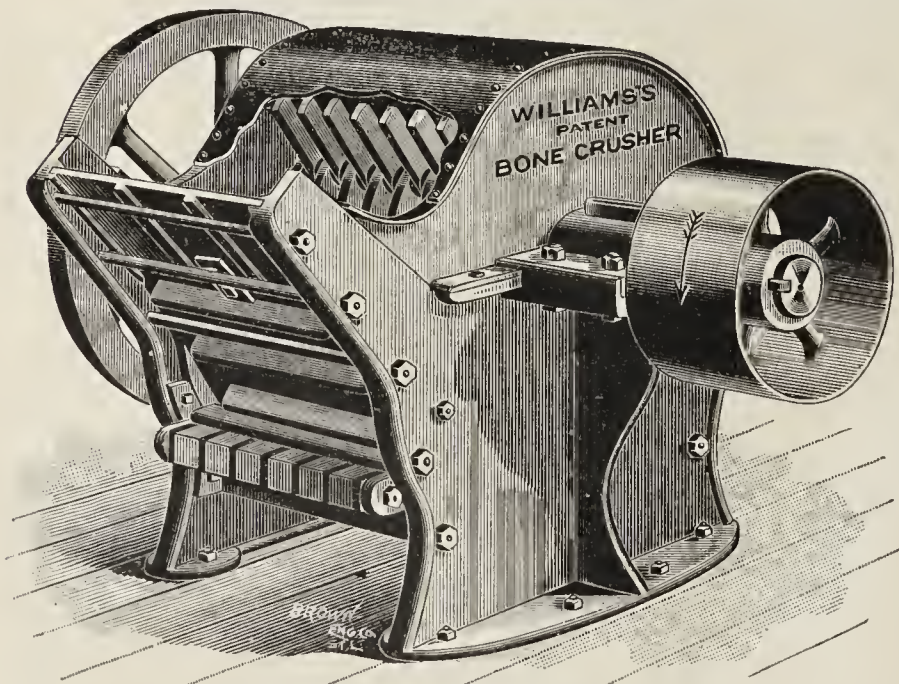
HYDRAULIC PRESS BRICK CO.

W. N. Graves, Gen'l Supt.

We can send you many Similar Letters.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

Our Pulverizer is fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



Williams's Shale Breaker.

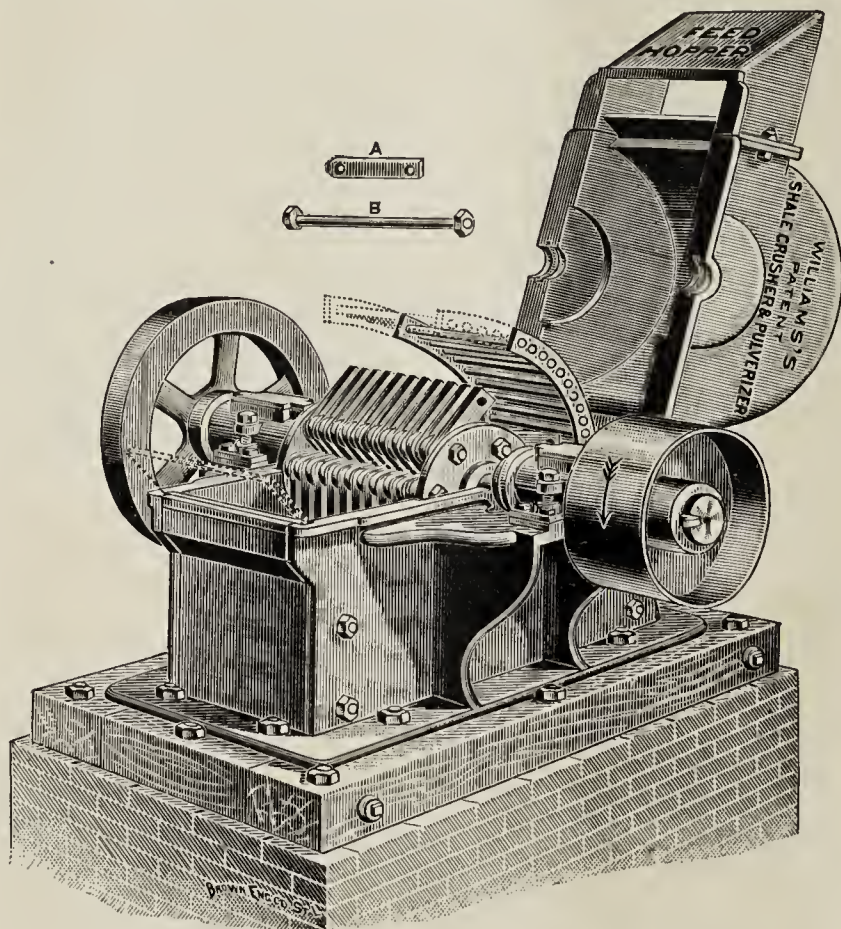
THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

2705 North Broadway, - - St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.



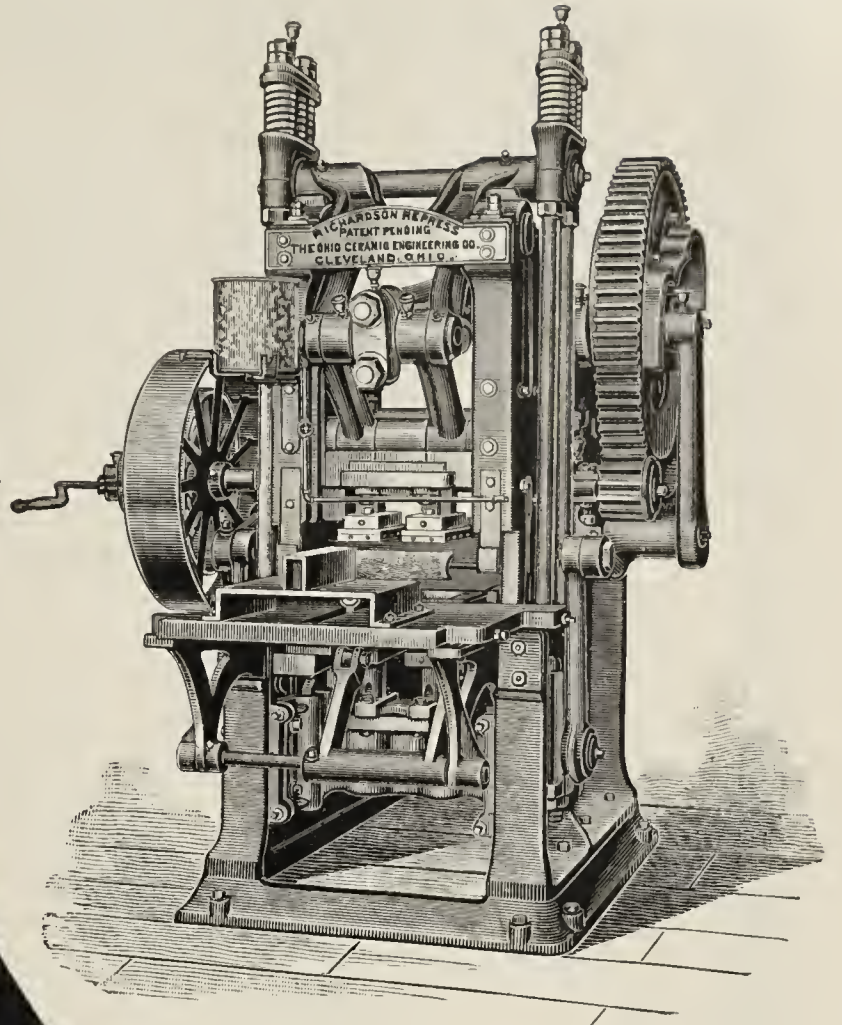
Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.

The
"Richardson"
Repress
is not a
complicated
machine

The
Ohio
Ceramic
Engineering
Company.

CLEVELAND,
OHIO.



Do
You
Want

We
put
this
down
in
black
and
white

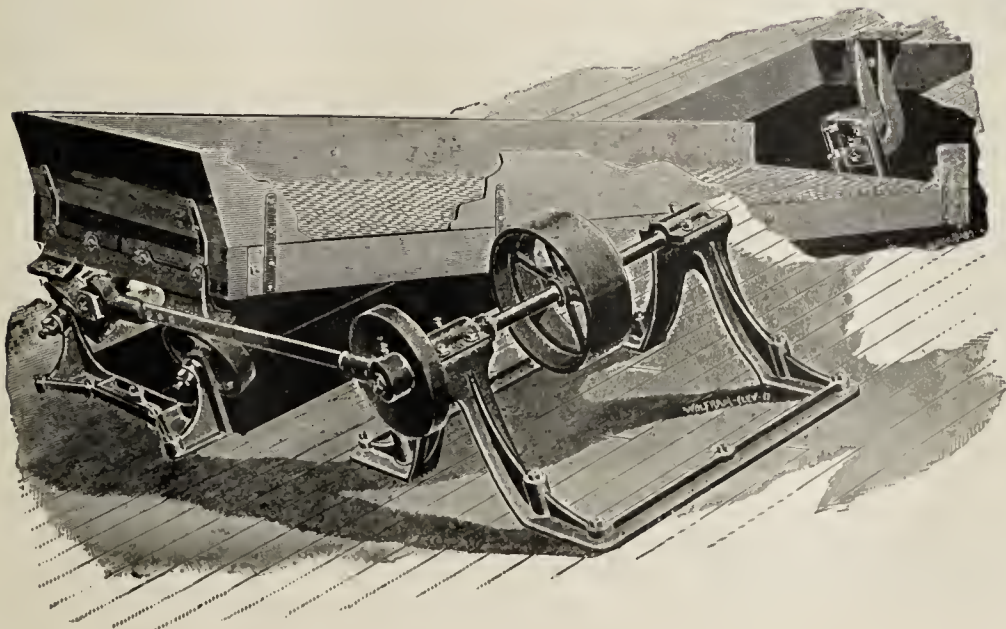
Did You Say

A Screen that is simple in construction—easily cleaned while in operation—takes up small space—adjustable to any angle—costs less than any other power screen on the market and one that you will not have to replace because you can't get sufficient clay to operate your plant. Then order one of our **Side Shaking Screens**. You can return them at our expense if not satisfactory.

The RICHARDSON REPRESS was complicated? Well, it isn't. The main difference between it and other Represses is that in the RICHARDSON the mechanism is in plain sight, above the molds, while in the others it is hidden beneath the molds, where it catches the clay and grit and wears out quicker as a consequence Which is best?

Please
remember
it.

Investigate
our improved
Screen.
It's a
good one.



Send
For
Catalogue.



FAME

WHEN A MAN or a product rises to fame, it is because of great intelligence, or pronounced superiority. An innate knowledge of human nature and a wonderful mastery of the English language are the foundation stones of the fame of Shakespeare. Ingersoll is famous, not so much because of his agnosticism, but mainly because of his ability to pour forth a flood of eloquence that moves audiences from peals of laughter to sobs and tears.

Fame comes to the field of manufacture just as it comes to men—because of decided excellence. This is true in a marked degree of

The Standard Brick and Tile Drier.

It is famous because of its simplicity.

It is famous because of its adaptability to clays of different natures.

It is famous because it can be so easily controlled.

It is famous because of the perfect manner in which it employs the continuous system of drying.

It is famous because of its real economic features.

It is famous because it does not disappoint—because it invariably does all and a little more than is claimed for it.

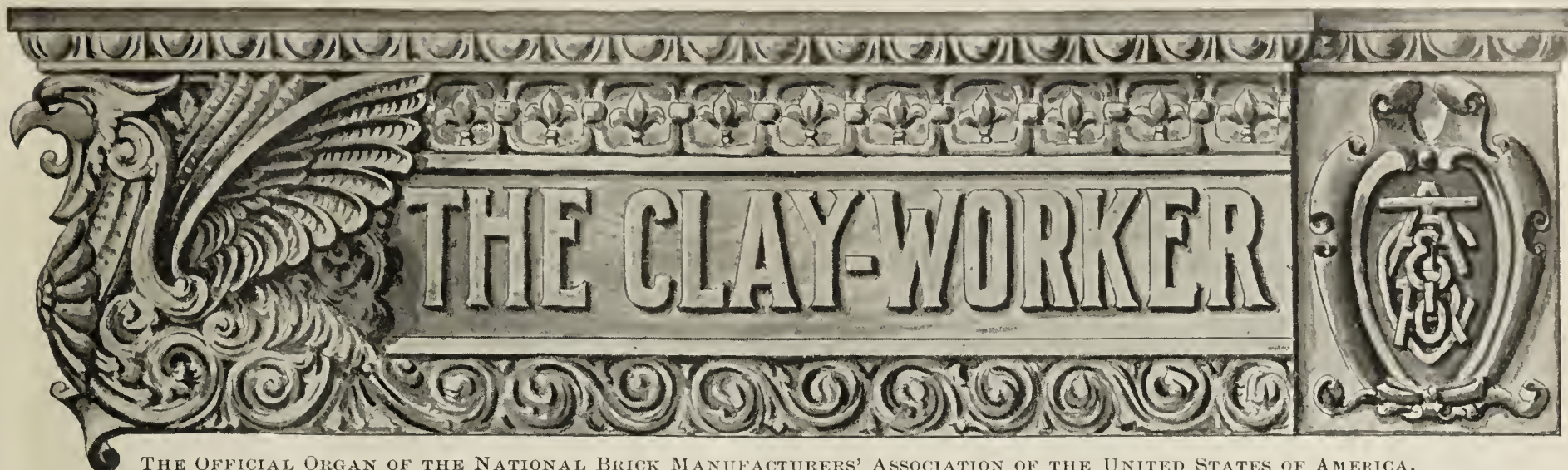
If you want to know all about **The Standard Drier**, our illustrated Catalogue will supply the information. Sent free on request.

....

The Standard Dry Kiln Co.,

186 South Meridian Street,

—INDIANAPOLIS, IND.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX.

INDIANAPOLIS, IND., JANUARY, 1898.

No. 1.

Written for the CLAY-WORKER.

THE HEART OF PITTSBURGH.

In and About the Convention City—A Good Place for Brickmakers.

PITTSBURGH is pre-eminent in many respects. She is many-sided and prolific to a remarkable degree. A manifestation of this is seen in the various names that have been given her at different periods, each of which, strange to say, has stuck to her as tenaciously as does the clay of her hills to the heels of the pedestrian who ventures to step from the beaten paths that wind up and away in irregular lines toward the horizon.

A few years ago, before the discovery of natural gas, when the dense smoke from her factories, furnaces and forges formed an almost perpetual canopy over and about her, she became known the world over as the "Smoky City," and is still so called. Later on, when the use of gas dispelled these carbon clouds, and her people were enabled occasionally to bask in undiluted sunlight, another name was given, and she was henceforth known as the "Iron City," an alias just as appropriate, for no other single community in the universe handles so much of the "poor man's metal."

Now, with equal fitness, she may have another christening—the "City of Bridges" would be just as appropriate a sobriquet as any of the former, for she is fairly girt about by a cordon of great iron structures that tie her hard and fast to the surrounding hills and valleys, from which come and go vast armies of toilers, daily bringing their wares to market, or laying their various offerings at the altars of Industry and Commerce.

These great bridges are marvels of engineering skill, the ponderous girders and

trusses of steel interwoven so artistically as to make charming pictures. So symmetrical are they, every part being so evenly balanced and adjusted with such exactness, that it would seem no load that might be placed upon them would be too great. With all their grace of outline, they appear as substantial and enduring as the hills about them. As the visitor looks upon them he may well marvel at the human ingenuity that conceives them and the enterprise and industry that builds them. There are twenty or more of these great bridges, spanning the Monongahela on one side of the city and the Allegheny on the other, representing an aggregate investment of nearly fifteen millions of dollars. What city under the sun can boast of more or be more appropriately nicknamed the "City of Bridges?"



APPROACH TO SMITHFIELD STREET BRIDGE, PITTSBURGH.

We picture the approach of one of the largest and finest—the Smithfield bridge, the two principal spans of which are some 400 feet in length each. It has four roadways and two sidewalks, and, though it cost close to half a million, is a free bridge—that is, no toll is collected for passage over it, as is the case with a number of the bridges, which we understand were erected as private enterprises. The approach to the bridge is but a few steps from the main entrance to the Monongahela House, where members of the N. B. M. A. will congregate February 15th.

The "City of Bridges" now has a population of 300,000, and if the surrounding boroughs were annexed, after the illustrious examples of New York and Chicago, she would at once take rank with the largest cities in the world, with a total population of more than a half million people. When this is done

wards. She is conceded to be the best lighted city in America—at night. We are pleased to make special mention of this feature for the benefit of those who find it necessary to take a stroll for exercise after dinner but are a little timid about venturing out in a strange city after dark. Pittsburg streets, while much resembling those of Boston, are so well lighted and labeled that there is little danger of getting lost, even during the wee sma' hours, and members of the N. B. M. A. are never out so late as that. In this connection we may add that the good Mayor has promised to see to it that no harm shall come to any visitor during the week of the Convention; so there need be no fears on that score. If further assurance is necessary, the local brethren will furnish special guides to any who may feel the need thereof.

—Why Not the "Brick City?"—

It strikes the writer that it would not be a bad idea to dub



THE HEART OF PITTSBURGH; B. & O. Union Station to the Right and the Monongahela House to the left of the Approach to Bridge.

"Greater Pittsburg" will embrace a district of such vast natural wealth and include manufacturing communities of such magnitude as to enable her to pass in real wealth a majority of the cities that have a much larger population.

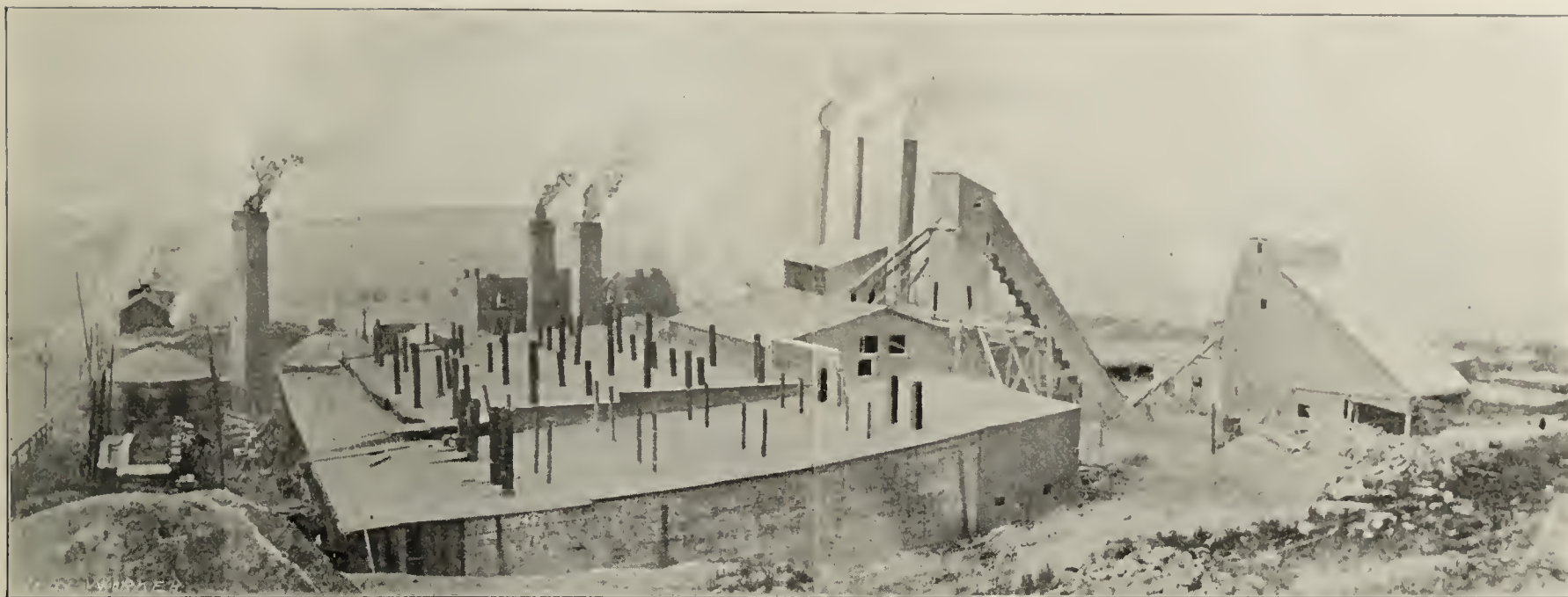
As we have previously stated, the "City of Bridges" is surrounded by great hills, which tower four, five and six hundred feet or more above the heart of the city. To facilitate transit to and from these elevations there are ten inclined planes, for both passenger and vehicle traffic. The average height of these lifts is 400 feet. The views from the hilltops are superb. A noted writer, on looking over the scene and referring to the flash of flame and cloud of smoke from the multitude of cupolas and furnaces, described it briefly as "hell with the lid off."

Pittsburg has nearly 200 miles of paved streets and boulevards.

Pittsburg the "Brick City." The name would fit her to a nicety, for she is truly a brick city. None other within our knowledge has more fine brick residences in proportion to population, and with all the wealth of raw material beneath, about and above her—she is literally hemmed in with mountains of clay and shale—she is sure to become more and more a "Brick City" with each added year, for her brickmakers are sufficiently enterprising and progressive to produce the highest quality of building brick and her builders wise enough to use them. So here's to the "Brick City"—a toast peculiarly appropriate just now, and one to be repeated many times during the week of the Convention.

—Works of the Boyd Hill Brick Company.—

We have mentioned the fact that Pittsburg brickyards are



Birds Eye View of the Works of Pittsburgh Terra Cotta Lumber Co.

scattered about through the city, instead of in outlying territory, as in other cities. A case in point is the works of the Boyd Hill Brick Company, which is located at the corner of Vickroy and Magee streets, almost within a stone's throw of the Allegheny County Court House. This affords a very short haul to the central part of the city. Their present location has been a brickyard for the past twenty-five years, and all the material for making brick in the past six years has been hauled in from cellars and other excavations. W. R. Hersperger, the manager, says they take almost anything, except tin cans, glass and garbage, and that nearly everything in that vicinity, if one knows how to handle it, will make good common hard brick. He also says they have no reason to complain, so far as trade is concerned, for they have done as well the past year as they expected, and have as many orders ahead of them for this year as they want.

Their plant is compact and easy to operate, and by giving it close attention they have been and are in a position to sell as low as any competitor. They are just closing their third year, and, notwithstanding the hard times and the sharp competition, have been able to make and sell 5,000,000 brick per annum. They use Henry Martin's brick machine, Fisher Foundry and Machine Company's dry pan, direct-heat dryer, steel rack cars, iron pallets, and burn in common up-draft kilns. Under the able management of W. R. Hersperger the plant will doubtless continue one of the most successful in the "Brick City." Mr. Hersperger is an enthusiastic worker in the cause of the N. B. M. A., and will render every assistance possible to make the coming

Convention the most successful in the history of the Association. His brother, A. A. Hersperger, will also be found among the active workers. The latter is the proprietor of

—The Union Brick Company.—

The latter's plant is located near Legionsville, a little station some fifteen miles out on the P., Ft. W. & C. division of the Pennsylvania railway. It was established in '91, and is similar in equipment to that of his brother's, the distinctive feature being a direct-heat Cummer dryer, with which Mr. Hersperger is well satisfied. It dries the brick rapidly and safely. The brick are burned in common up-draft kilns, of which they have several with a capacity of nearly 400,000 each. They burn with coal, the entire operation, from start to finish, requiring ten to twelve days. They have excellent shipping facilities, but most of the brick are used in their immediate vicinity, the price ranging close to \$5 per thousand on board cars at works.

—The Manufacture of Fire-Proofing.—

High up on one of the lesser hills in the eastern portion of the city is the extensive works of the Pittsburg Terra Cotta Lumber Company, which lie between Wesley and Summer streets on Bedford avenue. The Herron avenue trolley cars pass directly by the plant, which was built originally in 1889 by the Booth & Flynn Company, Ltd., under the direction of Geo. H. Albertson, now the superintendent of the brick works of the Booth & Flynn Company.

The story of Mr. Albertson's experiences in starting this industry, as he tells it, is of itself well worth a trip to Pittsburg.



The First Grinding.



Cutting the Hollow Tile by Hand.

It embodies so much of tribulation and disaster, culminating in a fire which destroyed the whole outfit, that if once heard would effectively cool the ardor of the most enthusiastic capitalist who might contemplate venturing into that line. That the plant was rebuilt and again started is no mean tribute to Mr. Albertson's pluck and energy, and that it was afterwards bought and operated by the present owners and the business increased to more extensive proportions and made a profitable venture speaks equally well for the sagacity and executive force of Mr. W. D. Henry, the executive head of the company which from the first controlled the entire product of the plant. They have several acres of shale, which tower up above the level of the works some fifty feet or more. The clay, which is almost as hard as rock, is blasted with dynamite and then carted to the dry pans, pulverized quite fine and elevated to the top of a tall building, passed over screens, which separate and send back to the crushers any pebbles or other tailings that escaped the grinders, and the screened or powdered clay conveyed through a long chute to an adjoining building, where it is again carried up by cup and belt elevator and conveyed to large pug mills, in which an equal

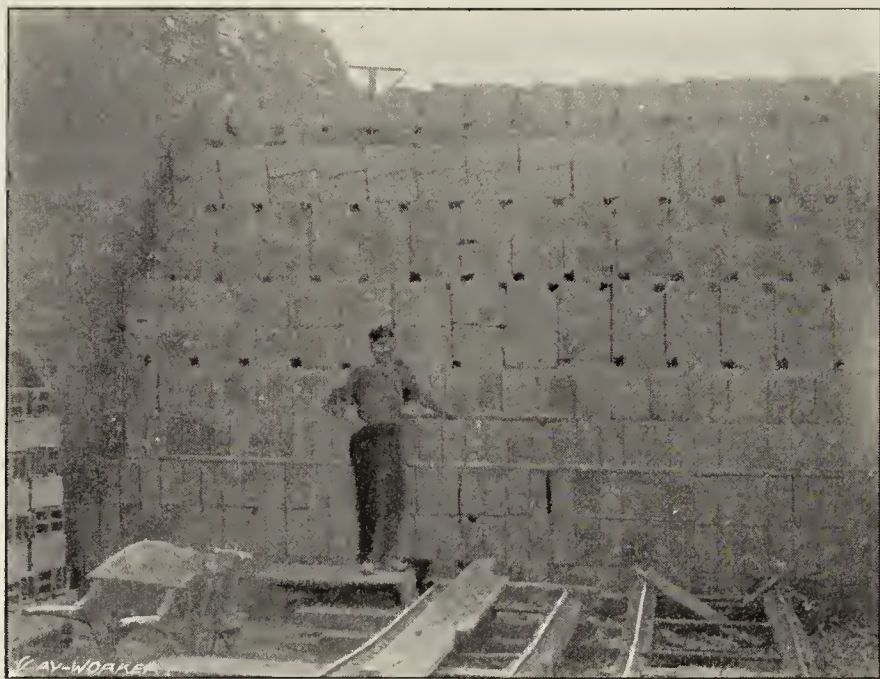


A Car Load of Hollow Blocks on the Way to the Kiln.

—Pittsburg Terra Cotta Lumber Company.—

The Pittsburg Terra Cotta Lumber Company was organized in the year 1889, under the laws of Pennsylvania, with the same officers as at present, who are D. F. Henry, President, William H. Graham, Treasurer, and W. D. Henry, Secretary and Manager. Mr. D. F. Henry is also Vice-President and General Manager of the Central District and Printing Telegraph Company, President of the Pittsburg and Allegheny Bridge Company, Director in the Central Accident Insurance Company and the Commercial National Bank. Mr. William H. Graham is President of the Mercantile Bank and Mercantile Trust Company, President of the Central Accident Insurance Company, and is also a director in the Pittsburg and Allegheny Bridge Company. Mr. W. D. Henry is a director in the First National Bank of Allegheny and in the Pittsburg and Allegheny Bridge Company.

The company was first organized with \$100,000 capital, with the view of not manufacturing, but of licensing others to manufacture under the Gilman patents and buying from these manufacturers and setting the material in the buildings. The first licensed company was Messrs. Booth & Flynn, Ltd., who made the material for the Pittsburg Terra Cotta Lumber Company for about two years. This arrangement proved unsatisfactory to both parties, and an agreement was reached between them by



Setting Hollow Blocks in an Up-draft Kiln.

amount of sawdust is added and the entire mass mixed thoroughly and fed into a Freese tile machine, from which it is forced through dies of various shapes, as the work demands, and cut into suitable lengths, either by hand or by machinery, according to circumstances.

Our camera caught the hand gang at work, and the picture tells the tale better than words. As the stream of the mixture of clay and sawdust is forced out of the machine, a wooden form or miter box is placed upon it, and with a few strokes of a hand saw the block is cut off and placed on wood pallets. The blocks are then stacked on iron cars and run into a steam-heated tunnel dryer, and from thence to either round down-draft kilns or ordinary up-draft clamps. Only a small portion of the ware is burned in the latter, most of it going through the round kilns, of which there are a large number. The porous fire-proofing or terra cotta lumber, being nearly 50 per cent. sawdust, burns quite readily, but the hard or dense ware requires a high degree of heat and a lot of it.

The following data relative to the establishment and growth of the business was furnished by Mr. W. D. Henry, to whom we are indebted for other favors.



A Glimpse of the Port Murray (N. J.) No. 2, Works of Pittsburg Terra Cotta Lumber Co.

which the Pittsburg Terra Cotta Lumber Company purchased the plant of Messrs. Booth & Flynn, Ltd., increasing their capital stock at the same time to \$170,000.

This plant is still operated by the Pittsburg Terra Cotta Lumber Company, but it was not long till they found that in order to compete with Eastern manufacturers it would be necessary for a plant to be erected as near New York and Philadelphia as clay could be found. In March, 1896, ground was broken at Port Murray, N. J., for a plant, which commenced operations in November, 1896, requiring just eight months to build. The capital was increased to \$500,000. At this plant the company owns 206 acres of shale, it averaging from fifty to sixty feet in depth. They have the equivalent of twenty 28-foot round down-draft kilns—there being two square Eudaly kilns. The equipment comprises a 28-tunnel dryer seventy-five feet long; three tile presses (two of the largest made by E. M. Freese & Co.), and one small one; one 300-horse-power engine; three boilers of 150 horse-power each, and three 9-foot dry pans. The dryers are built of iron beams, have terra cotta arches over top of them, with tile walls. Houses are being erected for the men employed at this plant, of which there are about sixty-five. At Pittsburg about fifty men are employed. Nothing is made at either works except hollow tile fire-proofing, both hard and porous, and some few hollow brick.

Among the noted buildings which this company has fire-proofed are the Holland House, Postal Telegraph, Commercial Cable, Queen Insurance, R. G. Dun and Pierpont Apartments, of New York City; Hotel Walton and University of Pennsylvania buildings, at Philadelphia; Mears' and the Chamber of Commerce building, Scranton, Pa.; Cairo Apartments, Washington, D. C.; Fidelity, Merchants', Herald and new Court House, Baltimore, Md.; Carnegie, Park, Times, Vandergrift, Tradesman, Hotels Henry and Lincoln, Pittsburg; Chamber of Commerce, Blacherne Apartments and News building, Indianapolis, Ind.

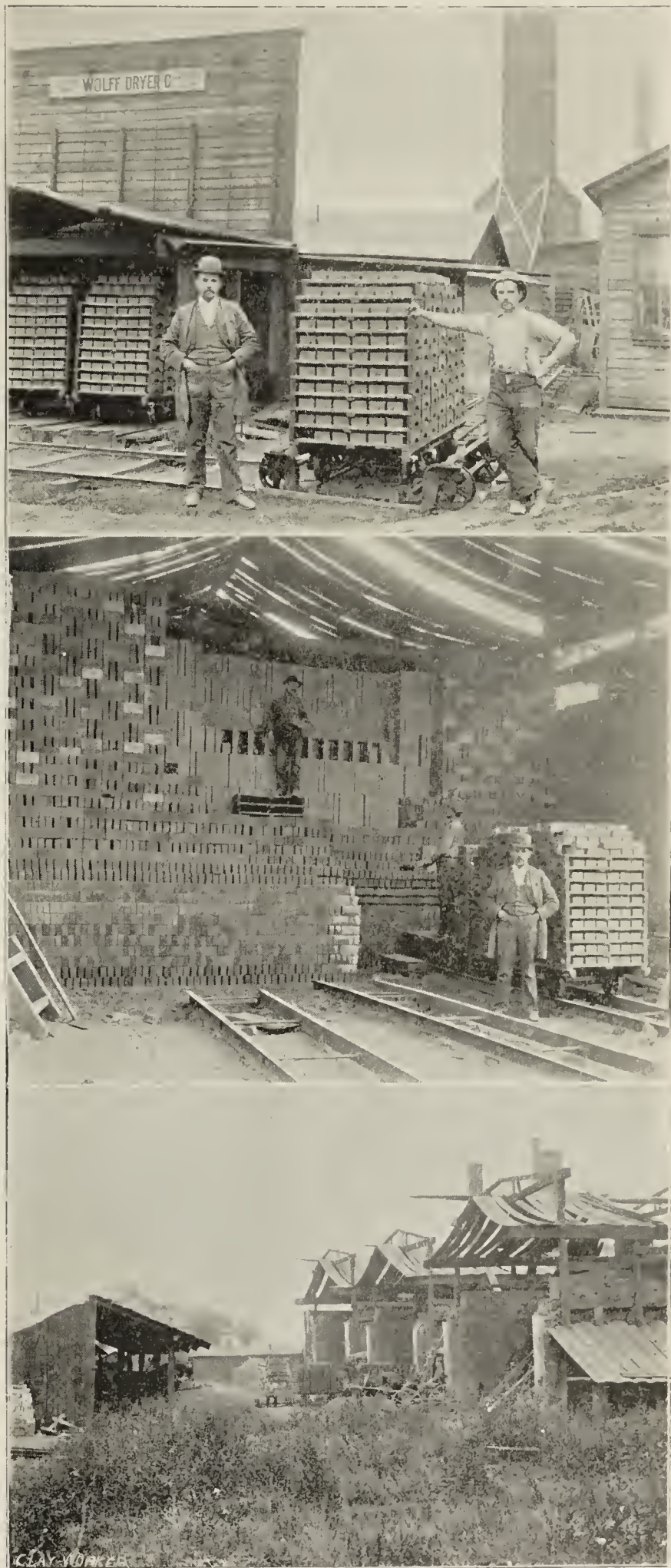
—Sankey Brothers' Works.—

Sankey is not a common name, but it is one very familiar to all connected with the building interests of the "Brick City." For nearly half a century the Sankeys have been engaged in the manufacture of brick, and the best residence streets of the East and South Side are lined with enduring monuments to their skill in the form of fine brick residences and other structures.

The senior Sankeys, William and Thomas, started in the brick business forty years ago, and have seen Pittsburg grow from a mere village to a great metropolitan city, and have themselves contributed no small part of the substantial element of this growth. One feature of the brick business that is most gratifying to those engaged in it is the permanency of the structures built of the products of the kilns. He who makes good brick leaves an everlasting evidence of his handiwork. Pointing to these earthly temples, the brickmaker can say to posterity, "These are tokens that I have not lived in vain."

Sankey Brothers make good brick, and we think their example might be followed with much profit by many brickmakers in other cities. Their chief object is quality, not quantity; by curtailing the latter and improving the former they achieve success, financially and otherwise, that is not possible where the effort is for quantity alone, for, as a member of the National Fire Brick M'frs' Association once said, "What doth it profit a man to make all the brick in the universe if he cannot sell them at a profit?" Messrs. Sankey argue that it is better for a plant to make 20,000 brick a day and sell them at a reasonable profit than to make 100,000 and sell them at or below cost price. Hence their plants are run at an easy, if not a slow, gait. Their East Side yard could turn out 40,000 a day if rushed, but they only make 17,000—but of these 17,000 nearly one-half are fine stock or face brick, which sell for \$12 a thousand. As compared with \$6 for common brick, bearing in mind that the only additional cost is in the additional care and skill in making and handling (none are repressed), it is not difficult to see that there is money in a limited output if it is made right and sold right.

The East Side yard is easily reached from the business center by taking a Pennsylvania avenue car to Atlantic avenue, where the plant is situated in the heart of a fine residence district. It consists of a Martin machine, from which the brick are taken and carefully placed on board pallets, and these



Sankey Bros. East End Yard—(1) A Load of Green Brick. (2) Setting Common and Stock Brick in Kiln. (3) The Kiln Sheds.

piled on iron cars holding 450, and run into a Wolff four-track dryer, which is 120 feet in length and holds 30,000 brick. The brick could be dried in twenty-four hours, but the Sankeys don't believe in rushing things so hard, and so the brick are dried more slowly, remaining in the tunnels forty-eight hours. They

get better brick by the process. They burn mostly in common up-draft clamps holding 250,000 to 275,000, setting the stock brick in the center of the kiln. They have one small square Flood down-draft kiln for emergencies—rush orders, etc. The original clay bank here has been exhausted, and they now haul from an adjoining block, where they have three acres of loamy clay averaging eight feet in depth, and which they use from top to bottom without stripping. It burns a fine dark red. A considerable amount of clay is hauled to them from excavations for cellars, etc., made in the neighborhood. The character of the surroundings may be guessed from the fact that the brickyard property is assessed for taxation at \$100,000.

This is a good yard for a careless brickmaker to visit about

and beneath which is a stratum of blue stone. At this plant they make an extensive line of fine pressed front and ornamental brick on a Simpson dry press. For this grade of brick they now mine their clay from a point several hundred feet from where they take the material for common brick. Openings are made in the face of the bank, and by tunneling in fifty feet or so a vein of clay is struck that is peculiarly suited to the dry press process and makes a very fine face brick. The clay is hauled in cars that dump from the bottom, and dropped in a pile near the dry pans.

The clay for common brick (a rock shale) is blasted from the face of the bank and handled in a similar manner. They have a Fisher dry pan and run it fifteen hours a day—storing up at



Sankey Bros.' South Side Works—The Clay Bank—A Rear View of the Machine House—Kiln Sheds and Stables.

the first of the year, when he has turned over a new leaf and made good resolves, for the good order and painstaking care which marks every feature of the work will make a good impression.

A long but very pleasant drive from the East Side yard with William E. Sankey, who is the General Manager of both plants, through a beautiful residence district, the streets of which are lined with fine brick palaces, across one of the bridges which span the Monongahela river and up steep hills that it would seem a horse could not climb with anything like a load, and we find ourselves at the foot of a precipice nearly a hundred feet high, about which circle the works of

—Sankey Brothers' South Side Yard.—

This plant, like the other, is run at a moderate rate. They have several acres of shale, which averages sixty feet in depth,

night a day's run for the dry press. For the latter, clay is screened carefully through a 16-inch mesh, while for common brick an 8-inch mesh is sufficient. Both pressed and common brick are dried in a Wolff steam tunnel, and the former are burned with the others in up-draft kilns set forty high, the press brick being set twenty high in the center, of course. They watersmoke with gas in three days, and finish in six to seven more. Their usual daily run is 10,000 press and 15,000 sand-molded brick, the latter being made on a Martin machine, for which Sankey Brothers are the Pittsburg agents. The Birmingham trolley cars pass the works.

When the elder Sankey first made brick in Pittsburg the site of this plant was a howling wilderness, filled with wild game. It must have been a favorite resort for goats of the species that delight in scaling precipitous heights.

—Neighboring Plants.—

Farther down the hillside there are several other similar plants. We do not now recall the names of any, save that of Keeling Brothers, of which we got a snap-shot from the head of the ravine. It is an old yard, and presents a picturesque appearance, as our readers may judge from the accompanying view. They make 15,000 common brick a day with the usual Martin equipment, dry in a Standard dryer, and burn in clamps, of which they have five, ranging from 200,000 to 300,000 capacity. Joseph Keeling, who is the business head of this concern, is a hustler and a thorough good fellow, as those who attend the Convention will learn, for he is on the entertainment committee and will play a prominent part in all its work.

—The Booth & Flynn Company, Limited.—

The works of this noted company are the largest and most varied in equipment of any about Pittsburg. Situated on the southern slope of Ruch's hill are virtually two plants in one, called the lower and upper yard. A ten-minute ride on the Forbes street car will take you to the very door of the office, a handsome two-story brick structure, from which Senator Flynn directs a multitude of interests, among which the brick business is but a minor part, though they make and market, in round numbers, 25,000,000 brick a year. But, we hear the reader say, such a business is in itself sufficient to wholly absorb the time and attention of any ordinary man. So it is, to be sure; but Senator Flynn is not an ordinary man. He is an extraordinary man, with a remarkable capacity for business, handling easily several lines and interests representing millions of capital, any one of which would stagger the average business man. Perhaps the best brief description of his capabilities may be summed up in five words—he is a great organizer. Whatever he takes hold of must be systematized, must have a responsible head, and that head must see to it that every detail is carefully looked after. By calling to his aid men fitted for the special duties he may entrust to them, he carries on business operations with all the force and effect that a successful general directs an army. Indeed, he is a general, and as such he is a power in the political and business life of Pittsburg.

The responsible head that has for years managed the brick works under the Senator's direction sets firmly on the broad shoulders of George H. Albertson, and it is a well-balanced, level head. Mr. Albertson is one of the best brickyard managers in the country. He reminds us much of Will Purington, of Galesburg. They are very much alike in mechanical ingenuity and executive force. Those who meet Mr. Albertson and go through the works with him will, if they have visited the paving brick plants at Galesburg, readily appreciate the similarity of these brickyard captains. They resemble one another in other respects, too—as members of the N. B. M. A. may demonstrate during the Convention, if they wish.

Leaving the office, the visitor has a good stiff climb up an almost perpendicular hill before the lower yard is reached. We have regretted many times that we did not get a snap-shot at Jesse Adams as he toiled up the steep ahead of us, one warm day in October. It was a living picture all right.

On this occasion we will approach the yard from the opposite side, and would advise visitors to do the same, and thus avoid the climb, taking a Center avenue car to Deviller's street, from which it is but a short walk to the summit of the hill overlooking the brick works. By this route we pass the mouth of Booth & Flynn's coal mine, from which they take a good grade of coal. They do not depend upon this mine for their entire fuel supply; on the contrary, they buy the larger portion of it in the form of slack, which costs them about 90 cents a ton delivered. This is hauled in wagons from the river to the foot of the hill and dumped into cars, which in turn are hauled by cable up the incline to the works. This hoist is in two sections, one for each plant, the cables being over 500 feet in length.

—Getting In the Clay.—

They own a large section of the hill; hence have clay enough to keep them running for another generation or two, the bank

being fifty feet or more in height. They first fall the clay with dynamite, and then an extra large Marion steam shovel is brought into play, the dipper of the shovel scooping up nearly a yard of clay at a bite and dropping it into side-dump cars of novel construction, the invention of Mr. Albertson. The bottom



(1) Entrance to Booth & Flynn's Coal Mine. (2) Upper Portion of Cable Hoist. (3) Lower End of Coal Hoist.

is wedge-shaped; the sides of the car are hinged at the top. The loaded cars are drawn upon a trestle by cable, when they reach the proper place a "trip" beside the track releases the bolt which holds the sides in place; they swing out, and the clay tumbles down of its own weight upon belt elevators and is carried

to the dry pans. Thus the work of handling the clay is reduced to a minimum, the man or boy who controls the hoisting drum and hauls up the loaded cars and sends back the empties being the only hand required in this part of the work. From the dry pans the clay goes to either revolving or shaking screens—they use both—and thence to pug mills, where warm



Booth & Flinn's Kiln Sheds.

water is added, the exhaust from the engine being utilized for that purpose; the tempered mass is then fed into either Martin soft mud or Penfield stiff clay machines, both kinds of brick being made. The use of warm water, Mr. Albertson thinks, facilitates the drying, which is done in "home-made" steam-heated tunnels.

On the upper yard the brick are all burned in common up-draft clamps, which also bear the stamp of Mr. Albertson's individuality. They are unusually large, each (there are seven in all) holding 500,000 brick. They are covered with metal roofing, which Mr. Albertson thinks is durable if placed high enough above the kiln to allow the sulphur fumes to readily escape beneath the eaves. None of their kiln roofs are less than ten feet above the top of the kiln at the eaves. They set fifty-two high and figure that they get better results from a given amount of fuel by so doing. As an experiment, they one time set a kiln seventy-two high, and found that it required no more fuel to burn them that high, but the difficulties of setting and emptying made it impractical.

—Setting Brick by Steam.—

Another labor and time-saving device invented by Mr. Albertson is a hoist for lifting cars of green brick to the kiln. It consists of an elevator which is operated by steam, a pipe for that purpose extending the entire length of the kiln sheds. The kilns are set in three tiers. The brick for the first tier (seventeen high) are run in from the ground level in the usual way. Then boards are placed on top of the green brick, and portable tracks laid on these, and the cars from the dryer holding 500 green brick are raised by the lift and run over the portable tracks to the opposite end of the kiln, and the setting proceeds as before. When this tier is finished, the third tier, which is set eighteen high, is set in a similar way. It virtually costs nothing to operate the elevator, so the scheme is both effective and economical.

Their delivery is entirely by wagon. Their investment in horse flesh alone amounts to more than the entire cost of an old-time yard. The lower yard is equipped with similar ma-

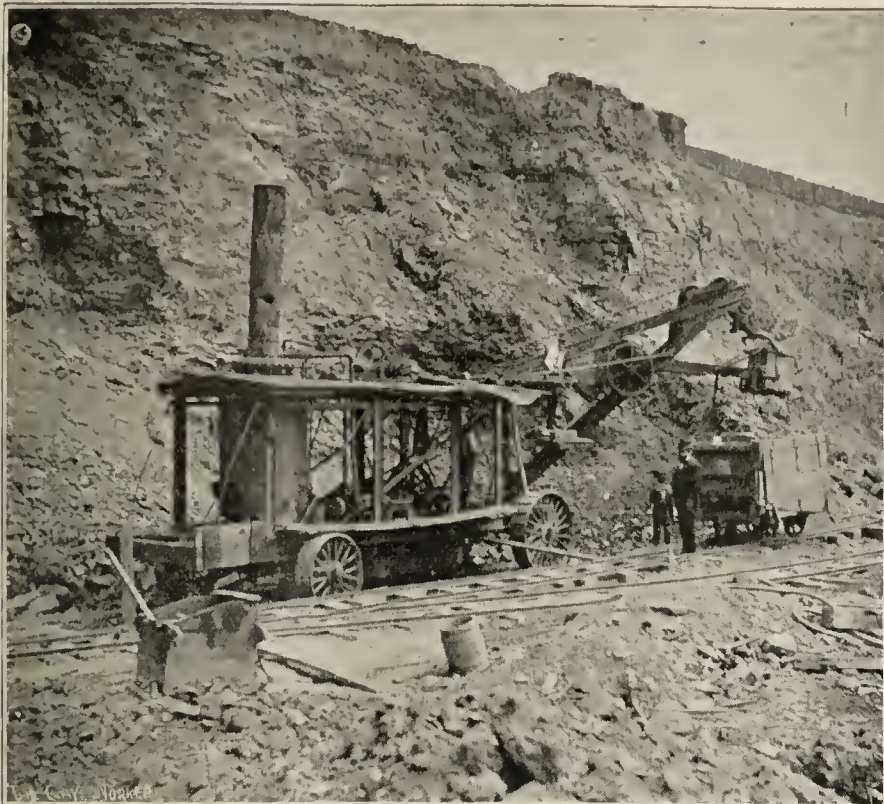


Emptying a Kiln—Booth & Flinn.

chinery. At one time they made dry press brick there, but found their clay not well adapted to that process, so the press now stands idle. Most of the brick on this yard are burned in a continuous kiln—a top-fire fourteen-chamber affair, each chamber holding 16,000 brick. It is a fuel saver, Mr. Albertson says, but expensive as to first cost. When he grows remin-



A Portion of Keelings Yard—A. Near Neighbor



Booth and Flinn's Clay Bank—A Section of the Upper Yard.

iscent he relates some interesting incidents connected with its original construction and operation, which was fraught with some tribulation. After they learned how to handle it, it worked very well, the burns being uniform and satisfactory.

These two plants are run in a thoroughly businesslike man-

they would go to pieces in no time. Yet they are still doing duty. The walls are built entirely of stone, the portions most exposed to the heat being thickly coated with clay.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

“I SAY, COLONEL.” I was rushing along a Chicago street as fast as I could go, dodging in and out among the crowd, when I was accosted by one who was unmistakably of the genus tramp. His complexion had that most unpleasant, ghastly, yellowish, unhealthy, lifeless, sub-dirt expression that indicated infrequent feeding and still less frequent washing. His clothing hung in angles, as hung on bones, and polished and greased wherever the bones protruded. His ample feet fluffed on the sidewalk, falling with softly padded

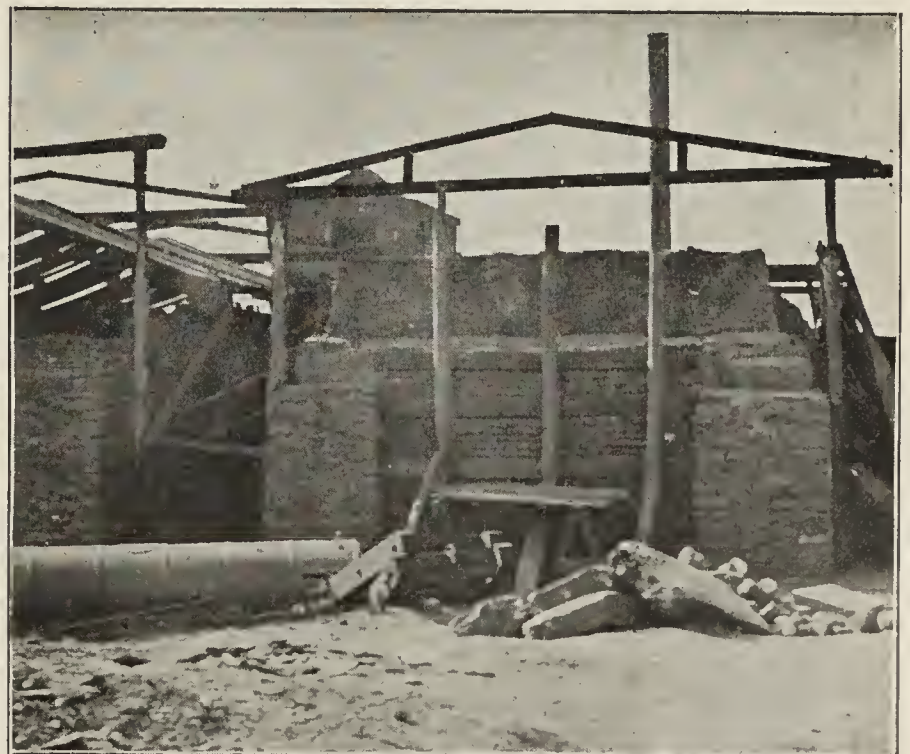


A Corner of Booth & Flinn's Continuous Kiln.

ner, every detail being looked after and checked up closely. Their system of accounts is very elaborate, every department being included in a daily report that shows what has been done, who did it, and what it cost. In this way they avoid all guessing, and know to a fraction just what their daily expenses amount to. If all brickmakers did this, some would not be so ready to cut prices. It is the guessers in the business that cause most of the tribulation.

—Stone Brick Kilns.—

There are many other plants in and about the “Brick City” that will well repay a visit. Perhaps one of the most novel sights connected with the brickyards is the kilns of stone used by Evan Jones and others in the vicinity of Liberty and Thirty-seventh streets, but a few minutes' ride from the hotel on the Liberty avenue line. The kilns are of the old Dutch type, and were constructed years ago by Mr. Jones, contrary to the judgment and advice of every other brickmaker in town, who said

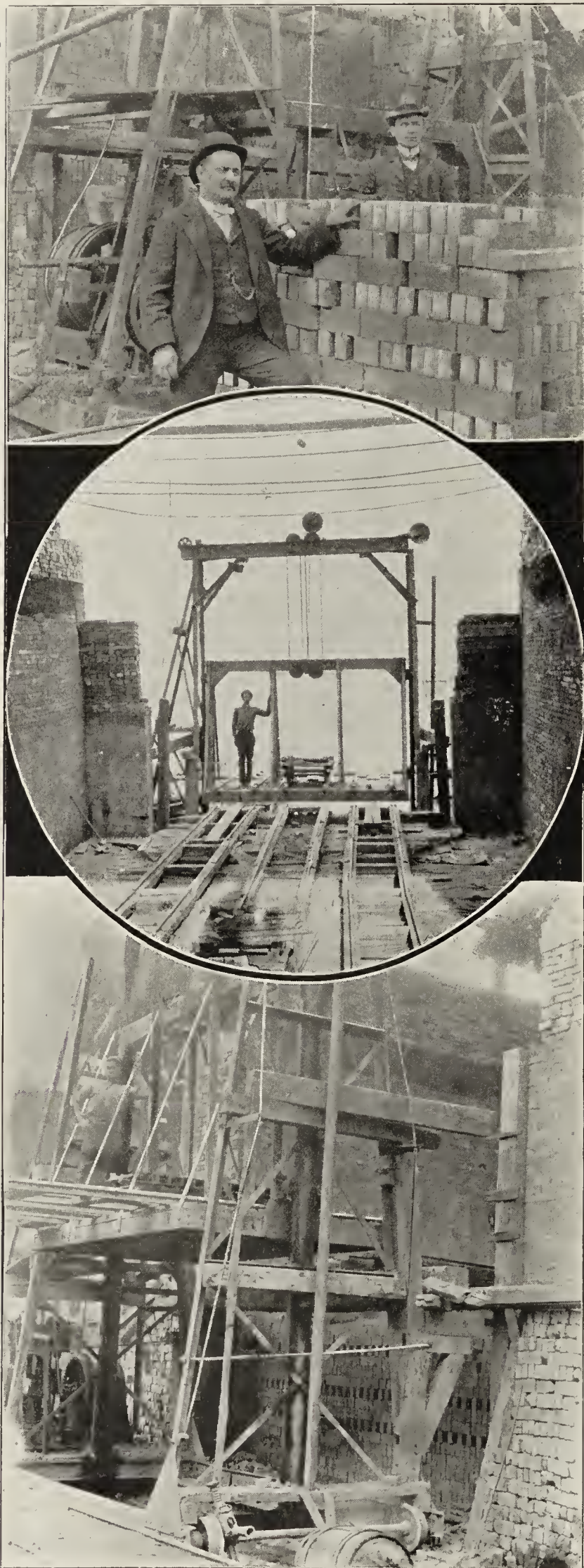


Burning Brick in Kilns of Stone.

effect as the fragments of leather, yarn and cloth came down as he ran at my side.

Hastily plucking at me and reaching a finger for my frayed button hole—he needed no signboard to locate that—he heaved a sigh so deep that it brought up crumbs—damp, saturated,

reeking crumbs—from his last free lunch, and again wailed out as he trotted along beside me, "Say, Colonel." Instead of falling away dejectedly, as I expected, from my shake of the head and "No," he continued to hold on and trot by my side, for I held my pace, while he wailed out:



Setting Brick by Steam—See page 18—(1) Mr. Albertson, Salesman Harry Hood and a Car Load of Brick on the way to Kiln, all "Bone Dry." (2) The Elevator as seen from the Inside of a Partially Filled Kiln. (3) Going Down with the Empty Cars.

"Say, Colonel, what kind of a free-silver convention city is this anyway? Why, I've been three days on the street now and never got further than that 'Say, Colonel.' Nobody in this rustling, bustling city, full as it is of benevolence and innocence and candor and—things, nobody knows or has cared or has had time to find out whether I was trying to lend money or inquire my way to the Palmer House. How could they know that I was not a long-lost uncle coming back to adopt them? How did they know I was not a convention candidate not yet disclosed or discovered? But this has gone far enough. I am going to have what I want, and that, too, with you right now, if my legs hold out. What I want is not money. I am past all that and scorn equally both silver and gold. What my wounded and susceptible inner consciousness now hankers for is that some elegant gentleman, some intelligent and affluent gentleman, like yourself, even though he be swift-footed, shall let me canter along beside him for a few blocks and talk to him. But mark you, he must listen; I insist on this. No talking into the impassive though willing ear of a wooden Indian will do me. I must have an intelligent and attentive listener, even if I have to accompany him on his busy way. I am willing to work my own lungs and legs, in fact, furnish all the accessories, but I must be listened to. I must have appreciative ears to whisper in, even if I have to travel to stay with them, and in this town it is evident that travel I must. I am not over particular as to the pattern of the ear, though I do confess for a liking for the style you are wearing—good, ample, long ears—even though they are a little bit pointed—they are receptive, anyway. They go in company with long legs, it seems, and are a trifle hard to keep up with. I'm not kicking though, mind," and he coughed a hollow, rasping, rattling cough that spoke of past potations and seemed to be asking for more. Remembering the crumbs I had gotten with the sigh and feeling justified in any means of self-defense, I gave him a violent shove, ripping out my button-hole, to which he clung desperately and pushed him off the edge of the river bridge, which we were then crossing. Peering over the edge I saw the damp dust of the Chicago River close over his head, and I saw it without remorse. I had killed him, but I was justified. I had to do it. The editor gives me only just so much space for these talks, and this man had used it all up and would have used more, and I could not stop him, so I just killed him.

GATES.

A VALUABLE POINT.

WHENEVER it can be arranged, the railway siding used for loading should be constructed about four feet below the level of the kilns and stock sheds, so that in loading the men can wheel into the railway wagons on a level or slightly down grade. The difference between this and having to wheel every brick up an incline to the floor of the wagon is more than appears on the surface. Men can do more work with less wear and tear on themselves and on the barrows and trucks. It seems a very simple thing to see a man wheel a barrow-load of brick up a run into a wagon. But take the output of a works making 20,000 per day; take five days per week and fifty weeks in the year, and we have five millions for the year's work. That means that every year there have to be lifted 17,500 tons, say, four feet from the ground. That does not look quite so simple. But it has to be done in order to get loaded, and is done, and the employer has to pay for it. This is another instance, except in those cases where it is impossible to avoid it, of a waste of force or energy that is of no benefit to anyone. In laying out new works this should be provided for by arranging the ground level of the works on a level or slightly above the floors of the railway wagons, unless circumstances render this absolutely impossible.—British Clay-Worker.

Man wants but little here below,
But hankers for the prizes,
He'll get them, too, if he's not slow,
And freely advertises.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK.—Fifth Paper.

—Glazed Brick.—



THE MANUFACTURE OF MODERN front brick is an industry requiring a good stock of brain and capital. To manufacture high class ware, uniform in color and shape, even in the most complicated patterns, is a task demanding hard and persevering labor. In these days of flashed surfaces and delicate shades, when every nerve is strained to produce something new, when immense stock sheds must be kept filled with brick of every hue and shape, ready for immediate delivery, when the die room is a mechanical museum and the catalogue a work of art, the brickmaker usually finds that the manufacture of front brick takes all the brain and capital he possesses, and sometimes more than he can raise, especially of the latter.

Among the tribulations which are the lot of the buff brick manufacturer the off shade is one of the most annoying. It is always with him, in fact, only too much so. Off shade brick have all sorts of hues excepting the right one, and it is a common practice of such brick to show several colors at the same time. Soft brick are another source of loss which is a constant quantity, small or great, even in the best-regulated brick works. Now, the writer wants to suggest a way of converting the off-shade and soft brick into new products, although he knows that it would add to the already heavy burden of the pressed brick manufacturer. Nor would the scheme be practicable for all front-brick makers, but only for those using light-burning clays, practically free from obnoxious ingredients, such as iron pyrites, and burning their brick at comparatively high temperature.

In these days of sanitary improvements the glazed brick is becoming an important factor in modern architecture. Its use has been retarded by the high price demanded for the high-grade brick on the market to-day and by the wretched quality of the so-called glazed brick offered at lower rates. What is wanted is a glazed or enameled brick which in point of durability and technical perfection is equal to the high-class brick, but which is sold at almost half the price of the high-grade ware, say \$50 per thousand. It is the duty of brickmakers to cater to this demand. That it can be done on a profitable basis has been proven by the European brickmakers, making due allowance for the difference in conditions existing between this country and the old continent. And it is for this purpose that the writer proposes to use the off-shade and soft brick which are satisfactory in regard to shape. It is evident that the manufacturer could not expect to produce white glazed brick out of such ware, but he could turn out colored glazes varying from brown to light buff and cream. The high-priced glazed or enameled brick is entirely proper in its place. It is the best of its kind and there will always be a certain demand for it and justly so. The use of these brick will increase rather than decrease with the advent of the commodity, the cheaper kind. The perfect white-glazed or enameled brick is fully worth its cost and it will always command a high price, for the production of the pure white is a difficult task. It not only requires a carefully prepared pure body, but also the most painstaking care during all the stages of manufacture. But the cheaper brick is bound to be used most extensively. Its uses are too numerous to mention. Wherever a perfectly impervious surface is desired the glazed brick will be called upon to fill the requirement. The one prime condition is that it must be of good quality, whatever may be the price. The glassy coating must be fixed to a body at a heat which suffices to cause the incipient vitrification of the brick. However beautiful may be the vitreous covering, if it is not "hard" and not attached to a well-burnt brick it has no excuse for being used. Good quality and technical perfection include the following points: Durability of body and glaze, clean edges and corners, evenness of glassy coating, freedom from crazing, shivering and dry spots.

The writer has made a series of experiments, having in view the utilization of off-shade and soft brick for glazing purposes. The brick used were made out of white burning clay and were graded according to their hardness, the harder ones requiring a thick, the softer ones a thin slip. The glaze was applied by dipping. The brick were burned in saggers, which were set among the brick in the usual square down-draft kiln. After the proper glaze composition was established no trouble was experienced in obtaining a smooth glaze. The temperature required for fusing the latter was sufficient to insure to the brick a good hardness. In fact, the experiments seemed to prove that with a clay burning white or buff and free from concre-

tionary iron satisfactory glazed brick may be produced from the soft and off-shade pressed brick.

From what has been said it appears that we are fully justified in discussing glazed or enameled brick in connection with front brick, and for this reason the writer will endeavor to outline the principles governing the art of glazing to the best of his ability.

On the outset we must make a distinction between glaze and enamel, two terms which are constantly interchanged, and to distinguish between them hair-splitting distinctions are often made. Judging from what prominent chemists have said on the subject it appears to the writer that an enamel is a glassy coating which is opaque, while the glaze is a transparent one. Both are glasses. By means of this distinction it is not difficult to tell one from the other. Any opaque glass, no matter whether produced by tin oxide in a soft lead glaze or bone ash or excess of silica in harder ones, we must call an enamel. Similarly, any transparent glass, whether colored or colorless, is a glaze.

Chemically all glazes and enamels are silicates, that is, combinations of silica with basic ingredients. Only one compound may partly take the place of silica, boracic acid, but of bases we have a good many. Potash, soda, lime, magnesia, lead oxide, alumina are elements which combine with silica to form white or colorless glazes. The oxides of iron, manganese, cobalt, nickel, copper and chromium are bases or fluxes which produce colored silicates. There is a third class of substances which do not combine with silica so readily, but which remain neutral and whose solid particles, instead of melting into the glass, are suspended in the fusing mass. After solidifying, if enough of these particles are present we have now not a transparent, but an opaque silicate, an enamel. To this group belong the oxides of tin, antimony, arsenic and phosphate of lime. It might be mentioned here, however, that excess of silica over a certain proportion of alumina likewise produces opacity, a fact which is quite important.

Among all the bases mentioned alumina occupies an unique place. It really is not a flux like the other bases, although it is an essential ingredient of every glass to be used for glazing purposes. In fact, alumina, like silica, tends to raise the fusing point of glazes. But its presence is required in order to prevent devitrification. A glaze composition which is composed only of silica and some of the fluxes on being exposed to a long-continued heat is liable to lose the glassy character, to devitrify. Alumina prevents this, and hence it is of prime importance in a glaze. Another quality imparted by alumina is elasticity, if we may use this expression. That is, it renders the glaze less subject to crazing. It is only at very high temperatures that alumina may be regarded as a flux, as, for instance, in the case of the porcelain glazes.

—The Ingredients of Glasses.—

We will now consider the sources of the different substances entering into the composition of glazes and we will be obliged to make some use of chemical language in order to make our statements more accurate. Right here let it be said that preparation of a glaze is directly governed by chemical principles and in modern practice the assistance of a chemist is almost indispensable.

Potash occurs in nature in the shape of salts, and as a constituent of rocks. It is used for our purposes in both conditions, and it may also be obtained from artificial salts, like potassium carbonate (K_2CO_3). The alkali mineral used most extensively in glazing is orthoclase, a feldspar containing, when pure, almost 17 per cent. of potash. The typical formula of this valuable material is $K_2O \cdot Al_2O_3 \cdot 6SiO_2$.

Soda (Na_2O) is usually derived from the carbonate, the chloride, the sulphate or the nitrate. In glazes containing boracic acid soda is always introduced with the borax. The carbonate of soda is the compound most generally used.

Lime (CaO) is found in nature as a carbonate, a sulphate or a fluoride. The carbonates and sulphates are the chief sources. The natural carbonates include the vast deposits of limestone, chalk and marble.

Magnesia is usually obtained from the carbonate and sometimes from a magnesium silicate, talc.

There are three compounds from which we derive the lead oxide (PbO), so extensively used in glazing, the red lead (Pb_3O_4), the carbonate ($PbCO_3$) and the sulphide (PbS) or galena. The carbonate is well known to the potters as white lead. The cheapest is galena, which, however, is always associated with impurities. All of these lead compounds are poisonous, and cleanliness is a prime requisite in handling them. The injurious action of lead is slow, but it is sure to take effect.

Alumina (Al_2O_3) is introduced into a glass by clay and feldspar. But as the composition of these is constantly varying, chemical determination is necessary for each individual case.

Silica, or silicic acid (SiO_2), may be obtained from various sources, but it is usually brought in as quartz, quartzite or

flint. Feldspar and clay also introduce it invariably. Boracic acid (B_2O_3) is almost always derived from borax.

All the coloring ingredients are metallic oxides and are bought as such on the market. Thus cobalt oxide produces blue; manganese di-oxide, brown, violet and black; iron oxide, yellow, red and brown; copper oxide, green and sometimes blue; chrome oxide, green; nickel, brown. By mixing these oxides in different proportions and combinations many colors and shades are obtained.

Written for the CLAY-WORKER.

OLD CHINA OF FRANCE AND ENGLAND, BEARING AMERICAN DESIGNS.

A Plea for a Public Collection of These Historic Wares.

BY EDWIN ATLEE BARBER.



SEVERAL FRENCH POTTERIES were turning out crockery decorated with black (usually overglaze) transfer engravings of French and English scenery, old chateaus and castles, early in the present century, perhaps between 1815 and 1820. They also used scenes from ancient Roman and Grecian history. One of the most important of these French potteries was located at Creil. The forms of the various pieces of table ware were graceful and odd—large circular plaques of various sizes, instead of oblong platters; round fluted dishes; gravy boats, with high-arching handles, and many other novel things.

Among the decorated designs used on these pieces were portraits of prominent men, among others that of Washington, which was copied from the enamel by Birch, after Stuart's first picture. There may have been portraits of other

times with a bright red ground, the print being in black. On the reverse side is a portrait of General Lafayette, who took such a prominent part in the events which led up to the surrender of Cornwallis. Indeed, so it is stated, the latter made the request that he might be permitted to treat with Lafayette in surrendering his army. It was decreed, however, that General Lincoln should enjoy that honor.

This Cornwallis pitcher, while not particularly scarce, is quite characteristic, being of an odd shape, unusual coloring, and rare, if not unique, combination of lusted glaze and black printing. It is not to be supposed that this design was produced very soon after the close of the Revolutionary war. As a matter of fact, it must have appeared thirty or forty years later, or possibly was issued at the time of Lafayette's visit to this country, in 1824.

While the last mentioned design was probably of Staffordshire manufacture, its origin being somewhat uncertain, we have no doubt of the birthplace of most of the dark blue plates which are turning up constantly. I say "of most," because all of the blue and other old English china was not of Staffordshire manufacture, as it has been discovered lately that some of it was made in Liverpool. But the view of the Exchange at Baltimore was a Staffordshire production,—exactly where we cannot discover, since the maker's name is not given. This view is comparatively scarce, though it will be found in many of the better collections of old china bearing American views. It has only been found on ten-inch dinner plates, so far as we know, yet it is possible that it may turn up later in other sizes or on other pieces of ware—who can say?

Collectors of old china are coming to the conclusion more and more every year that the old English potters decorated their wares by no set rules, but used these engravings of American buildings and scenery rather indiscriminately wherever they could be inserted. As an example of this, we may mention the view of "Woodlands near Philadelphia," issued by



Cornwallis Resigning his Sword at Yorktown, October 19, 1781.



Cornwallis Pitcher Reverse, La Fayette.

Americans, and probably were, but they have not yet come to light. The Washington plate is embellished with a well-drawn border design of fruits. The Creil works were established some time in the last century by Englishmen, which will account for the employment of English and American subjects in the decoration.

Among old English china made for the American market will be found a pitcher design (in various sizes), bearing on one side a representation of General Cornwallis resigning his sword at Yorktown on October 19, 1781. These pitchers are sometimes ornamented with copper lustre bands, and some-

times with a bright red ground, the print being in black. While it may be true that some of these American designs are found only on one shape and size of plates and other things, the majority are liable to appear on almost any piece belonging to a table service—a plate, platter, tureen, vegetable dish, or, possibly, a pepper box.

One of the old English potters, Mr. Thomas Mayer, issued a series of dark blue designs of the arms of the original States. These are to be found on plates, platters, and perhaps on other shapes. It is supposed that the entire thirteen States were represented in the series, though several of them have not yet been discovered. Within a year or so some have turned up,

and it is probably only a question of time when the others will be found. This series is characterized by a handsome floral border, in which the trumpet flower figures conspicuously. The platters usually have four and the plates three wheel-shaped ornaments at equi-distant points around the margin. Beneath each design is the name of the State represented. It is curious to note the differences in some of these early designs of various State arms when compared with the present State seals. Take, for instance, the Pennsylvania arms platter, whereon the shield is supported by two horses, the one on the left standing, while that on the right is reclining on the ground and looking up at an eagle which stands on the summit of the shield in defiant attitude.

The original of the Baltimore Exchange plate, which is here reproduced, is owned by Mr. W. F. Sheely, of New Oxford, Pa.

The old English potters sometimes labored under the impression that the United States was such a small country that its inhabitants must be sufficiently familiar with the various educational and charitable institutions scattered throughout the land to recognize the engravings used on their wares without the aid of explanatory inscriptions. For instance, a somewhat common view on plates is the picture of a building with high columns in front, simply labeled "Dumb Asylum." Collectors have not been sure whether this was an American or an English view. It was placed in the same category with the plate bearing a view of "The Zoological Garden," which, however, is now supposed to represent the London institution, and not the New York. But it has recently been discovered that

instructive and interesting subjects has been entirely overlooked. Many of these ceramic prints have been copied from well-known etchings and engravings, and some of them are the only surviving illustrations of historic American structures.

What an opportunity is here presented for some public-spirited lover of art to rear a lasting monument to his own



Dumb Asylum, Philadelphia.



Old French Plate, with Portrait of Washington.

the "Dumb Asylum" is a Philadelphia view, and the old engraving from which this design was copied has been unearthed. Plates bearing this design have been found in several colors—light blue and pink, and possibly others. The building is still standing, at the corner of Broad and Pine streets, the front being in almost the same condition as shown in the print, which was made half a century or more ago. It is now occupied by the Pennsylvania School of Industrial Art.

It is rather surprising that no wealthy and public-spirited person has yet thought of furnishing funds for the purchase of old china bearing American views, for the formation of a comprehensive collection for permanent preservation in some public museum. There certainly could be no more interesting collection made. Altogether, more than four hundred different views are known which relate in some manner to American history. No serious attempt has ever been made to gather these together for a public institution, for the reason that funds for this purpose have always been lacking. Ten years ago it would have been possible to form a practically complete collection at a cost of perhaps a couple of thousand dollars. Now it would be more difficult to secure examples of all, and the cost of specimens, without taking into consideration the time expended, would probably reach \$10,000. Ten years hence, or perhaps within half that time, such a collection, if it could be made at all, could not be gathered together for double that amount.

Almost every week we read of valuable bequests or gifts to various public institutions for the purchase of collections of objects of art or of natural history, and yet one of the most

memory or that of another. A complete collection of American ceramic views, historical, architectural, scenic, patriotic, in rich dark blue, in dainty underglaze pink and green and lilac, would perhaps attract more attention and excite more interest in a public museum or other institution than any other collection that could be formed. There is no such public collection of any importance in the world to-day. With a fund of \$10,000 it would be possible to form a practically complete collection of this kind within the space of a year.

Some one will doubtless furnish funds for this purpose some time in the future. But may it not then be too late? These designs are becoming rarer every year, and the time is rapidly approaching when they cannot be purchased at any price. It is not yet too late to undertake this work. And



Old English Plate with view of Baltimore Exchange.

where could such a comparatively small amount be expended to greater advantage? To those who take an interest in these things it is a source of constant regret to see the rarer designs passing out of reach year by year. That will be a fortunate institution which shall receive the necessary means to form such a collection before it is too late.

Some of the rarer of these American designs on old china were published in the Clay-Worker of April, 1895, July, 1895, April, 1896, November, 1896, and April, 1897.

THE ILLINOIS CLAYWORKERS ASSOCIATION'S ANNUAL CONVENTION

THE FIRST CLAYWORKERS' CONVENTION FOR '98 A DECIDED SUCCESS.

Decatur Proves a Fine Convention City — A Large Attendance, a Lively Body, and a Good Time all Around.

THE TWENTIETH ANNUAL Convention of the Illinois Clayworkers' Association convened at Decatur, January 5th, and proved one of the most successful in the history of that organization. The meetings were held in the Circuit Court Room, which was delightfully cozy and well suited for the purpose. The Convention was called to order on schedule time by President W. S. Purington, of Galesburg, who invited those who had not already done so to communicate with the Secretary. Nearly half a hundred responded, and each in turn was decorated with a very pretty badge. The Convention was rather youthful in appearance compared with former Conventions; still there were a goodly number of venerable appearing gentlemen scattered through the audience. Nearly all the old stand-bys were there, as may be seen by looking at the list of members. Though there did not seem to be so many machine, kiln and dryer men present as at former Conventions, these interests were well represented by the genial trade missionaries who delight in the social side of these yearly assemblies—and the incidental booking of an occasional order.

When the enrollment had been completed Secretary Stoll proceeded with the roll-call, and as each member's name was called he was given an opportunity to report the result of the past year's work. Nearly every one responded briefly, stating the amount of brick and tile made and sold during '97, the general trend of remarks indicating a steadily improving condition of trade.

—Reports of Members.—

Mamer Bros., Campus: All we have to say is that we did about twice as well this year as we did last year, and that we are feeling well and hope the future will be still better.

Wm. Hammerschmidt, Lombard: We have done about the same as usual; made a few tile and a few brick, mostly building brick, but a few pavers. We let Brother Purington make the pavers. We

make by the stiff-mud, side-cut process. We made about 6,000 feet of drain tile, one-third four-inch tile and the rest mostly large tile, from eight-inch up. We made about 500,000 brick.

W. S. Purington, Galesburg: We have made about 38,000,000 brick this year. We consider the business better than it has been for four years past. Prospects for next year are much better than the past year.

H. F. Townsend, Avon, Ill.: If I remember correctly, last year everybody was full of confidence, and I can say for myself I have had a taste of it, and it has given me an appetite for plenty more.

Wm. Stare, Mendota: I have not seen any of the confidence. I have not turned a wheel this year. I have nearly all the

outlook is better, and it is evident that the outlook for the manufacture of brick is better. I am not going to take up your time. I am here to sell machinery, if I can, but, like the other machine men, I am here to have a good time and learn all I can of the trade. I do not think Mr. Purington is going to have more competition in the paving brick line than he has had. I think there are very few inquiries for entirely new plants. The dull times of '93 to '97 have prevented a great many clayworkers from making improvements, which I believe they are going to do now, and call for duplicate parts of machinery instead of new plants. There are a number of fire brick plants going up in the country, but I do not think there are many building and paving brick plants going to be built.

D. V. Purington: I suppose I am to speak for the Chicago business. I do not think there is a brickmaker in Chicago as well off financially to-day as he was a year ago. I do not think there is a single plant in Chicago but was run at a loss last year. It is rather humiliating to me to say, but in all the twenty-six years I have been in the business this is the first year we have ever had the balance on the wrong side of the ledger. The supply was very much greater than the demand. We have, all told, in Chicago a capacity for manufacturing about 1,000,000,000 of brick. That last year there were only used about 300,000,000, and of course everybody wanted to get a little more than his share, and in the effort they reduced the price until we all sold brick at a loss. The yards all shut down. I suppose there are less brick in Chicago to-day than there has been before at this season in fifteen years. This, of course, makes us feel a little better and more hopeful. We are trying now to make an arrangement whereby we can sell our brick at a profit. While we do not pretend to control prices, we have a little understanding with one another that we will not cut one another's throats quite as badly as we have in the past. I do not think that in Chicago the machine men are going to reap very much of a harvest the next two or three years, except in the way of repairs. I say we have all lost money in Chicago, but I do not believe the truth is yet known. If we are at the head of a stock company we have to go before the stockholders at the end of the year, and if we have been



President W. S. PURINGTON.

stock I had on hand. I sold a few brick and could have sold more if I had wanted to, but prices were too low.

A. R. Batley: I have nothing to say.

D. V. Purington, Chicago: I think Mr. Batley represents a class we all want to know something about. We want to know whether we are going to have more competition this year than we had last. [Laughter.]

Mr. Batley, Bucyrus, Ohio: I am scarcely in a position to answer Mr. Purington. Most of you are aware that I have been in Europe all of the summer of '97, but since my return I think I am safe in saying that the outlook for trade in general is very much better than it was in '96 or '97. I think the other machine men in the audience feel that the

losing money the natural tendency of the executive officers is to make our report as good as we can. So we inventory a little bit higher than we ought, and it does not look as bad as it did. Then afterwards, when we get down to hardpan, it looks a good deal worse. Then there is the wear and tear on the plant that we do not take sufficiently into consideration. Like others, I am in hopes that the boom of prosperity spoken of will soon strike us. We made last year 50,000,000 brick, and if we had made up to our usual capacity of 50,000,000 or 60,000,000 this year, we would be in the sheriff's hands.

A. L. Solisburg, Aurora: We manufactured about 1,800,000, and we are so close to Chicago we get the benefit of the cut-throat operations in Chicago. [Laughter.] Prices have not been very good. The outlook for the coming spring trade is very good. The coal strike set us back some this year, but the outlook is promising.

L. H. Lambert, St. Mary's: The prospect for the season is good. We only made about 200,000 tile and no brick.

J. M. Powell, Orestes: I have not much to say. We did not start up until late in May. Since that time we have run steadily, and are now about sixty days behind in orders on certain sizes in tile. So far as the brick business is concerned, it has not amounted to anything with us.

C. C. Barr, Streator: We manufactured about 8,000,000 brick during the season and sold about 7,000,000. The prices are a little better than they were last year on building brick. Paving brick have been about the same. We have had a little Chicago competition in the building brick line that knocked us out. We were also stopped by the coal strike from the 1st of July until September, which, of course, interfered with our business. The prospects are better than last year.

Clark & Pickard, Minonk: We made about 2,000,000 sand-mold brick. This year we put in a stiff-clay machine and made tile and paving brick. We could not make tile enough, and our paving brick are all gone, and we are nearly out of building brick. We did as well this year as any year.

D. E. Kretsinger, Egan: I do not know that I have very much to say, being a stranger in a strange land. We are a young concern. We sold as many brick in '97 as in '95 and '96 together. The outlook is good.

F. Plumb, Streator: The Streator Tile Works suffered this season on account of hard times and the coal strike. Perhaps forty days' run would cover the time we have run our plant. We made about 750,000 shale brick, and we have them on the yard. We hope to do better next year.

John Kloess, Belleville: We made about 300,000 soft mud brick and 3,000,000 pressed brick. This is only about one-third my capacity.

Oliver Tillbury, Towanda: We have a little one-horse plant; made about \$4,000 worth of tile this year.

R. McShane, Lostant: I, like my friend who spoke a moment since, am a stranger in a strange land. I am glad to say that my trade during the past year has been better than in two years before. I have made about one-third more ware, and have had less bother with machine men—only one coming our way the past year. [Laughter.]

W. A. Eudaly, Cincinnati: You all know I come from Ohio. Just now we are all very much excited over the senatorial contest in Ohio. I want it distinctly understood I am not pledged yet to either side. I am not yet decided which side I shall vote for. I am on the fence. I was talking a while ago to a very honorable gentleman, whose word we rely upon always, and he remarked to me that among his family there were two boys who were very different in their make-up. He says that one of these boys, when asked a question, always tells the truth without any hesitancy what-



President-elect H. F. TOWNSEND.

ever—just blurts it right out. He says the other boy always studies the situation before he makes a reply. Do you know, I have always felt that there was a great deal of that done in our reports from year to year—that some gentlemen get up and just simply tell it right out, as the last gentleman did [laughter], while other gentlemen always study the situation? Now, in connection with my business I wish to make this statement, and you can say I have studied the situation or that I am telling the truth, just as you like. But I am frank to say that I have not been bothered with the usual number of brick manufacturers the past year that I have in former years. [Laughter.] In preceding years I have noted two classes of brick manufacturers. One class who was always willing to pay reasonably well for whatever they got, without any question, and another class who always wanted something but did not

want to pay for it. During the past year one of these classes has been entirely eliminated. I am serious now—I am just blurting out the truth. I have noted that there is a class of brick manufacturers with whom I have come in contact who are willing to pay reasonably for whatever they get, and I must say I have not been bothered very much with the class of men who are always trying to get something for nothing, as in previous years. These are facts. While the number of calls I have had during the past year have not been so great, it is an indication to me that business among clay manufacturers is becoming more substantial from year to year. I know a great deal is said in a jesting way about prosperity and confidence, and all that sort of thing, but there is no doubt at all but that times are getting better.

Mr. Billingsley: That is a great deal for you to say. [Loud laughter.]

H. M. Baldrige, Illiopolis: I made ten kilns of tile last year and sold the most of them. I do not think the brick-makers of this country are very smart. I mean they are making too large a brick. Take the lumber men; they are cutting the size of their lumber down and their prices up. The brick men are cutting the other way. I think we ought to have a standard size of brick, and it ought not be too large. [Applause.]

H. Brewer & Co., Tecumseh, Mich.: We did not make a single brick last year, and we sold every one of them. [Laughter.] I do not know that I have anything to say in regard to the brickmaking business, but when you get onto special lines, then you can call on H. Brewer & Co.

Elder & Dunlap, Bloomington: Speaking for the Bloomington Pressed Brick Co., we have not done as much business as we did last season, due to a late start in the spring, on account of poor prospects for trade, and the interference of the coal strike, which shut us down for about two months; but we sold all we had on hand and all we have made up to the time of the closing of the brick season. Our plant is still running, with a prospect of a good trade in the spring.

Chicago Brick Machinery Co., Chicago: We have sold more machinery the last three months than we have in a year before. The outlook is very bright.

F. E. Swift, Washington, Iowa: I manufactured about 1,200,000 brick and about 300,000 drain tile the past year. I burn brick in the summer and drain tile in the winter. Have sold about 600,000 brick and have the rest in stock. Have not sold any tile at all, scarcely. I am still running the plant. We have not sold any tile since last spring. I might have sold all my brick, but I have been out on the road working on my kiln furnace.

H. C. Patton, Flanagan, Ill.: We made about 75,000 tile and about 100,000 build-

ing brick. The yard is cleaned up better than it has been in the last three or four years.

The Wallace Manufacturing Company, Frankfort, Ind.: As for the brick machinery business, I am afraid if I told you we made a fortune at it this year some of you would say I was prevaricating, and you know machine men always tell the truth. One brother said he had not been troubled very much by machinery men, and I assure you we have not been troubled very much with brick and tile men, although we have offered to pay their expenses if they would come and see us. I am interested in a small summer brickyard. We made about 2,500,000 brick last year and sold them, and could have sold more. Our stockholders were very much pleased. Being in the brick machinery business gives us an opportunity of knowing the condition of the general business of the country; we get correspondence from all over the country, and it has been noticeable, when we write to customers asking if they do not want some new machinery, their replies are all like this: "Too busy to talk about brick machinery." That makes the outlook very hopeful, and during the last sixty days we have received some promises and some orders that are very encouraging. I read a little story the other day about a man who drove a wagon round the streets, selling vegetables. He had a very sunny disposition, but all he knew of the English language were the words "All right," and he had a very happy way of saying them. No matter what happened, he said "All right." If he sold his vegetables it was "All right;" if the door was slammed in his face, it was "All right." And I am inclined to take that as a watch-word. If a man asks me how things are coming, I will just say "All right." [Applause.]

Morea Brick and Tile Co., Morea: We have only a small plant; made 500,000 brick and 200,000 tile. We have had a very good year, considering our having had to stop on account of the coal strike. We did a very nice business, and feel much encouraged.

D. O. Loy, Atkinson: It is said that an honest confession is good for the soul. I did considerable business at a time, when I realized there was too much confidence, so that when confidence left the country and went to the Klondike, I found myself and competitors in considerable trouble. I am the spirit of the man you have called for, and if you are willing to hear I will proceed.

D. O. LOY'S REPORT.

Kind friends, I must say were I present to-day,
I would make my report in straight prose,
But if I am absent I cannot do that,
As every one present well knows.

The reason is clear, why I cannot be here,
Which in rhyme is more easily told.
I sailed on a voyage upon the deep sea,
Got shipwrecked and lost all my gold.

My factory lost, sold for half its cost,
The mortgagee raked in every gain,
Which left me in debt, with money to get,
It was hard on my pocket and brain.

With a half-broken heart I made a new start.
I got up and worked with the sun.
Then in burning my tile, I kept pace with the moon,
So my day's work never was done.

Some day I'll get rich, crawl out of the ditch—
For some this will be a surprise.
Till then my career must be clouded, I fear,
And the truth I tell taken for lies.

I am not without hope, for I'm climbing the slope;
My heart is still beating with pride,

But until my feet are placed firm on the road,
My income I dare not divide.

In reporting this meet, kindly use some deceit,
And say D. O. Loy was not there,
For I don't want the world to hear about me,
While my heart is still burdened with care.

From this meeting, I pray, do not drive me away,
Oh, it does my heart good to be here,
To look in your faces and hear what you say,
Will make my task easy this year.

If I keep on the track I am sure to come back
In your ranks; I shall take my old place.
Then till I am dead I shall hold up my head,
And look this gay world in the face.

May I give you a point, I am running a joint,
Step by step I am climbing the hill,
But heavy the load and as hard is the road,
As the tile I now burn in my kiln.

To keep out of court, I will make no report,
But my brick and tile are both fair,
While the fuel I use is as cheap as my clay,
For its dug from my own little mine.

It would be my delight, could I banquet to-night—
Such a feast would be good for my health—
But if I were called to respond to a toast,
I might talk like a man who has wealth.

To boast of success is not healthy, I guess,
With clouds hanging over the head.



Poet Laureate, D. O. Loy.

If you tell about me, say I'm out at sea,
Or, that the poor, mortal is dead.

But if I were dead, by some 't would be said,
My own weeping friends to console,
He had springs in his heels; in his head he had wheels,
But at last he has them under control.
—D. O. Loy.

J. C. Ammann, Decatur: Business here in the spring looked slow, which caused us to start late in the season, but prospects brightened the latter part of the season. We made perhaps between thirteen and fifteen hundred thousand brick and sold them all. As compared with last year, we made more brick and sold more last year, but the price was better this season, so we made a little more money than last year.

T. Lincoln, Colfax: I bought a factory a year ago at Colfax—a one-horse plant, with the past year's stock. I sold them all out and made about 300,000 brick, and the same of tile, and sold them all.

L. C. Farnham, Pawnee: I have not much of a report to make. I have not been in the tile and brick business a great while. I started in with a small plant, and I have not increased much. Last year was the smallest output I have made, I think, for the past fifteen years.

We made about 170,000 brick and about 60,000 tile. I have got most of the tile on hand that I had when I started up last spring. The tile trade has been very slow, and I have been selling them at less profit than since I have been in the business.

D. M. Duddleston, Stewartson: I have nothing to say that will interest you. I have not done much this year, and I thought I ought to come to the Convention and get some of the enthusiasm that we always have in an association like this. Business has been a little dull. We made about twelve kilns of tile and 300,000 brick. Sold most of the brick, but very few of the tile. The prospects are a little better at this time.

E. M. Pike, Chenoa: I have been thinking that misfortune has been against me all this year. When I hear the reports so encouraging from my brethren about here, it makes me regret the condition I am in. I sold my plant last year, and thereby is the grief. The last two years, you know, my report has been something like this: We mowed the grass down between the piles of tile and made paths, so that the yard would look well. The next year we neglected these paths of the season before, until finally we let the grass grow up, and it still grows there. This fall and winter we have changed these paths; the grass still grows all right, but where the tile were piled is where the paths are. We have sold about 11,000 or 12,000 tile, and I like these paths better than I did those we had made the two or three years before. I see the paths of other people are in a similar situation.

J. J. W. Billingsley, Indianapolis: I am very glad to hear the reports given here this morning—so many of them are favorable. I was aware, however, before I came here that the sale of tile has been much better this fall, and even last spring, than it has been for the last two or three years. I think if there is any field I am familiar with, it is the tile business and drainage interests. I am receiving more inquiries now regarding drainage. Manufacturers are considering the practicability of fitting up small plants to make tile in locations where they have had no tile. I do not know, Brother Purington, that Chicago is a fair sample of the business done this year.

D. V. Purington: I do not think it is.

Mr. Billingsley: I think the country at large and away from Chicago—the farther away the better—[laughter] is, on an average, prospering.

Mr. Purington: We are slow, but we will get there in time. [Laughter.]

Mr. Billingsley: Yes, I suppose so; you have a habit of getting there. I am very glad to be here at this Convention. I believe I attended the first Convention at Springfield, just about this time of the year twenty years ago. I think the first number of the Drainage Journal had a call for the first Illinois Convention. I think I have missed but one meeting in that time, and that on account of sickness. I must say there is quite a change. There are a great many I knew in the first organization of this Association who have passed away and never will be seen here again. There are only a few old faces here. Twenty years work quite a change in the population of any section of the country, and yet I am glad to meet those I have met before, and glad also to meet those whose acquaintance I have formed so recently. I am glad to be with you. [Applause.]

Secretary Stoll: That ends the list so far of those who have reported. For myself, I have not much to say. Up in

Kankakee county, last spring, the Curtis plant was started early, as they had no stock on hand to speak of. They had a very good trade up to about July. They kept running until the coal strike stopped them, and since then they have not sold much of anything. They do not make many brick—mostly tile.

President Purington: I think we can all feel encouraged over the bright prospects for the future. I think we can all look for better things next year. There are a few announcements which I wish to make. The banquet to-night will be held at the St. Nicholas. The Secretary will provide all members with tickets. In the morning a trip will be made to the various brickyards. The start will be made from the Union depot, where a special train will be in waiting. We will leave at 8:30 sharp.

It was moved by Mr. Plumb, and seconded by several, that the Secretary provide a question box for the use of members who had questions to ask. The motion carried.

Secretary Stoll: I have a message from E. W. Bach, who is on the programme for a paper, stating that he was injured yesterday in an accident, but that he will send his paper by mail.

Mr. Randall: Mr. Bach is one of the brightest men in the Association. His absence from the meeting is a loss to us all, and I move that the Secretary be instructed to send a telegram of condolence to him.

A. L. Solisburg seconded this motion, which was duly carried.

Secretary Stoll then read a letter from the Western Passenger Association, in which it was stated that a special rate could not be made members unless at least one hundred were in attendance.

After some discussion regarding railroad rates, etc., Mr. J. M. Mamer moved that a committee of three be appointed to memorialize the railroad companies and co-operate with other similar organizations to secure reduced rates. This motion was seconded by Mr. Plumb and duly carried.

D. V. Purington: I move that this committee consist of the President, Vice President and Secretary of the Association. (Carried.)

On motion of J. M. Mamer, the Convention adjourned to meet at 1:30 p. m.

SECOND SESSION.

Wednesday Afternoon.

The Convention was called to order by the President, who introduced the Hon. B. Z. Taylor, Mayor of Decatur, who addressed the Convention as follows:

Mr. President and Gentlemen of the Illinois Clayworkers' Association—Some of you I have met, and some I have not—hold up your hands. Now put them together—shake. [Laughter and applause.] Now, gentlemen, I have no apology to offer for not being a statesman or a speaker.

MAYOR TAYLOR'S WELCOME.

It affords me great pleasure to meet you this afternoon on the occasion of your vention: It affords me great pleasure to meet you this afternoon on the occasion of your Twentieth Annual Convention, and in the name of the people of Decatur I extend to you a sincere and cordial welcome to our city.

We are glad to have with us the representatives of this great association of manufacturers, and trust that your stay in this city will be pleasant, profitable and enjoyable to all.

This country has been passing through a

pretty severe siege during the last three years, and I know the brickmakers have felt the depression in common with all other business men. In our own city we have felt the depression, but I think it has not affected us as much as it has many other cities in this country.

The city of Decatur has a splendid location and we look forward to a brilliant future. I would like to have you, during your short stay among us, look around the city as much as possible, and gain for yourselves a knowledge of its many attractions.

Decatur was among the first cities to commence the improvement of its streets by paving them with brick. Make your foundation right, cover it with good brick, and, in my opinion, it is as good, if not better than any other pavement on earth today. [Applause.]

I know that you will be hospitably entertained by your brethren in this city, and and that you have taken no chances in committing yourselves to their hands for a few days.

Again I extend to you a most cordial welcome to our city, and trust that you will find it so pleasant that you will be glad to come to us again, which I most heartily invite you to do at as early an opportunity as possible. [Applause.]

Secretary Stoll: The next on the programme is the

PRESIDENT'S ANNUAL ADDRESS.

Gentlemen of the Convention: Twenty years have elapsed since this association was organized, and may there be as great advance in the next score of



G. C. STOLL, Secretary, Grant Park.

years as there has been in the past—not only in the number of our membership, but in the advancement of our trade.

It is wonderful what giant strides have been made in the last twenty years. Dry pressed brick were just commencing to come before the public, but were hardly considered good enough to put on the outside of a building. Terra cotta, that most beautiful of clay products, was hardly known, although strictly speaking, terra cotta is applicable to all clay products, but what I have reference to is elaborate works of art, such as our friend Gates produces. Paving brick during this period has come forward to fill a long-felt want as a paving material, and changes have taken place in all lines of our trade, and what wonderful changes will take place in the next score of years none of us can foretell.

Each year brings new demands upon us in building material—new shapes and colors. Some are resurrected from a time more than twenty years ago. The old has become new again. We used to sleep with one eye open to watch for drops of rain, when we left our brick exposed to storm and rain. Now the trade in some localities demand that they be pox-marked with rain drops.

Where a few years ago we (or I should say the public) were satisfied with almost any form of clay for paving purposes that was vitrified, now they must equal the finest of pressed brick, and each year sees the demand for a larger size increase, and the only limit will be the size of our kiln doors, but I

think they make a mistake in demanding a brick that will weigh over seven pounds.

One year ago your President, in his annual address, told you that we had passed through a very trying year. I cannot say this to-day, for while we cannot say that we have had as good a year as many in the past I think we are all willing to admit that we are now well advanced on the road to better times—better than we have had for many years. We feel a good deal as I once felt after lying on my back some four weeks with typhoid fever. I will never forget my first day out. Everything looked different—the trees never looked so lovely, the grass so green, the air so pure. Well, we have all had typhoid fever, or worse, but we are well now and everything looks different, more promising. We cannot say, however, but that the past four years have had their advantages. It has taught us to manufacture cheaper than ever before, it has compelled us to manufacture better than ever before, it has sharpened our perceptions to the wants of the trade. It has also taught us economy.

Among other things it has taught us that owing to small demand, contractors have figured with so small a profit, or with no profit at all, that when the day of reckoning came they asked us to make up part of the losses they sustained. Of course they did not ask us in just that way, but it amounts to just the same thing. They were short so much material, there was so much rejection, etc., etc. We would all have thought more of them had they asked for a donation. Material men were in the same straits. The profit was figured so close that the rejection of one brick would turn the profit on the wrong side of the ledger. Who is the gainer by these low prices? Neither the material man nor the contractor. Neither is the owner, be he individual or corporation, for it will be a cheap job from start to finish. Demand is one thing that will help us to avoid this, or we must form some sort of a combination that will insure us against such ruinous competition as we have had the past few years. We know trusts are illegal, but I quote from one of the leading magazines: "In the interest of economy, in the interest of the great body of consumers, trusts have become necessary. A further step must be taken in the direction of concentration and consolidation. The gigantic combination is to the ordinary corporation what in former days the latter was to partnership." I believe this to be true. All contract work would be done better if done by responsible parties, but so long as competition is so great as it has been the past few years, any one can buy material and do a large job and get his capital from the material men, but as I see we have a paper on this subject, I will not exhaust it. We wish to live and let live. For a few years past we have changed this to die and let die.

I do not know how it is with the rest of you, but the times for attending the State and National conventions are the most pleasant times of the year for me. We come closer to each other, and when we all meet in competition, we shall have a feeling akin to brothers, and not that feeling we would otherwise have were we to meet for the first time on the field of battle. We have all met on the field of battle in the past few years and fought bloodless fights, and we did not all come out victors. Many times the defeated made the most money. I believe times of peace are now at hand, and there will be no time to cut and slash.

I believe in the Illinois Clay-Workers' Association, and we shall show to the State what the National Brick Manufacturers' Association has shown to the Nation, that we are a power. Nothing done by the National Association has been so useful as the work performed by the Paving Brick Committee appointed a few years ago. It has established a uniform series of tests that are destined to be adopted by every city in the Union, and too much credit cannot be given Prof. Edward Orton, of Ohio State University, at Columbus, who through his untiring efforts has been enabled to convince the most skeptical engineer that the tests advised were only fair ones.

Let us take up matters of this kind, and let our power be felt not only here in Illinois, but throughout the land. Let us study the needs of our trade, and while we cannot accomplish the end at once, we can in time. At every convention held there is much information imparted from member to member. Let us help each other. We all have our petty annoyances and troubles, some of which are mutual, but some have overcome them. You will receive as much as you give.

To the local members and citizens of this city, let me say in behalf of the Association, thank you for your cordial welcome. Many valuable papers are to be read and discussed, and I will not take up your time further. [Applause.]

Secretary Stoll: This brings us to our first paper:

Mr. Plumb: Before I start I want to say one word in apology of this paper. When this subject was submitted to the Secretary I felt it was not quite fair to the members of this Association. He assured me that it would find a welcome here, and I give it to you for what it is worth.

BURNED CLAY FOR ROADS.

By F. Plumb, Streator, Ill.

Mr. President and Gentlemen of the Convention: This Association had at its last convention a paper on "Brick Roadways." The only objection rural districts could raise against such roads as then discussed would be the great cost of construction.

An interesting inquiry then is, can we find a good substitute for brick-paved roads, and one that shall bring the cost down to a probable acceptance of the rural districts.

Where good packed gravel can be had, having only a short haul, it has been very acceptable, and is now being extensively used in many places where the people are alive to the value of good roads.

—Wide Tires.—

The subject of good roads is up all over this country, and were I to select the point of most importance to be presented to the public at this time, it would not be brick roads, gravel, nor even burned clay for roads. I should urge the use of wide tires. Wide tires would be my hobby. By compulsion, or by premium, I would induce the use of wide tires on our country roads and improved city streets. Wide tires improve dirt roads. Narrow tires are complete road destroyers. No dirt road can withstand the combined attack of water and narrow tires. The wide tire should be three or more inches in width and should be arranged so as to be non-tracking. The first step toward the model country road at the very slightest cost should be drainage and wide tires.

—Burned Clay.—

In canvassing the problem of good roads for the country, attention has been called to the use of burned clay. The Clay Record of October 29, 1897, has the following: "The utilization of burned clay as a road material is mentioned in the last Missouri Geological Report, as a subject that should be fully discussed. Some of the railroads are already using burned clay for ballast in preference to rock, sand or gravel, with good results, so that the extension of the use of this material for roadways is in reality beyond the experimental stage. Prof. Wheeler says in his report on clays, that while it is not as good as tough rock for the heavy traffic of cities, it would be desirable for country roads, where the teams are few and the loads light. It can be prepared wherever the clay is, and often by the roadside, and as the heaviest roads are those in clay soils, these may be made to furnish the material for their own improvement. There is plenty of evidence of the value of burnt clay for ballast at many places on the Burlington Road." This report of Prof. Wheeler's referred to, contains a very long and elaborate discussion of many of our clay-working problems, and to this report I am indebted for many of the statements of facts made use of in this paper.

—Water the Enemy of Good Roads.—

The great enemy of good roads is water. Water mingled with the clay mechanically and water combined in the clay chemically. The former is to be dried out and drained out of the road bed. The latter can be got out only by burning. I shall not discuss the value of drainage to accomplish the former, but will take up the latter, the burning of clay to make better road material.

Plastic clay and bad roads are almost always closely related. You find the one and you have the other. Get rid of the plasticity in the clay, and you at once improve it as a road-making material. Chemically combined water may not be the immediate cause of plasticity in clay, yet if you drive out this chemically combined water by heat, the clay changes its character, and becomes non-plastic. Its plastic quality cannot be restored again, even by subsequent pulverization.

Driving off chemically combined water by heat causes a series of physical changes to the product, increases its hardness and brittleness, causes a change in color, and a loss of plastic quality. The result is a product

approaching in value that of gravel for road-making purposes.

—The Bad Lands.—

We have illustration of the foregoing facts. In Eastern Montana, near the line of the Northern Pacific Railroad, is found what we call the Bad Lands. These lands present in appearance a very broken surface of a dull, brick-red color, covering several square miles in extent. This material when broken up makes an excellent railroad ballast. A close examination reveals the fact that at one time these lands were composed of a bed of shale or clay, and below this clay was deposited a bed of coal. This coal was ignited and burned in its own natural bed, and in this way burned the overlying material to its present condition, somewhat like broken brick. This burning process is still going on. In the State of Missouri, no less than eight railroad companies are burning gumbo for railway ballast.

—Gumbo.—

Gumbo is a dark, plastic, tenacious clay carrying from two to five per cent. of carbonaceous matter. When burned this gumbo changes to a dull brick color, breaks up into small blocks, and not only makes a satisfactory railroad, but is also used for walks and roadways near the place where burned.

The burning of clay for railroad ballast is carried on in this State in a less number of places. In some of our coal mining towns the shale, clay, sulphur lumps and fine coal mingled therein thrown out from the mines in great heaps, in some instances have become ignited and burned out. This material has often times been used for road-making purposes, with considerable satisfaction. As to the value of the latter much depends on



FAWCETT PLUMB, Streator.

the character of the shale and the amount of burning it may receive. I am informed that it is a common practice in England to burn clay in large heaps to secure good material for walks and drives. In the foregoing we have enough to suggest the problem of burning our common surface clays for road-making materials in places where gravel cannot be easily obtained. I am persuaded that it can be done at comparatively low cost; that the clay can be taken from the roadside ditches, burned into suitable condition and deposited along the roadway just where needed for use.

—Methods Suggested.—

Several plans have been suggested by which this burning can be done. One is that of a long row of clay to be burned without any preparation, somewhat after the manner of burning gumbo for railway ballast, and burned on the roadway where needed for use. Another is to burn it at some grate pit after the same plan of burning gumbo, and then haul it to the place for use.

I shall offer for consideration a different and novel scheme for doing this work. Machinery of a well-trying type will be called into use. A kiln will be used in which much of our past experience will be made available. It may seem somewhat of an air-castle, but all castles are air castles before they are ground castles. The novelty of our scheme will serve to invite the undertaking. To mold clay into a multitude of shapes is now an every-day occurrence. We burn anything we choose and do it as may seem best to us.

—The Traveling Kiln.—

The novelty then which we will offer, will be the fact that our kiln is to travel when

at work and in use. Such a kiln will be bound with sheet iron, lined with brick and placed on a heavy set of trucks, and immediately connected with it in front as it shall move along the road will be another strong four-wheeled truck, which is to carry the power and machinery for working the clay. The clay is to be taken from the roadside ditches, pugged and moulded into some suitable hollow form, somewhat like miniature drain tile of about three-fourths of an inch in diameter, and two or two-and-a-half inches outside diameter, cut up into lengths of perhaps two inches. This particular form is suggested as one best adapted to rapid drying and ease in burning. This kiln should be eight or ten feet in diameter at bottom, fifteen or sixteen feet high, and having a taper to a slightly smaller diameter at the top, to aid in the draft when burning.

When in active operation, the lower part of our kiln will show a heat of fully 1,200 degrees, that degree of heat necessary to drive out of clay the chemically combined water, and a less degree of heat as we near the top of the kiln, until at the extreme top we shall find the green material being water-smoked and dried out of the moulded material just dropped into the kiln for the mill. The fuel to be used will be a good article of coal slack finely pulverized. This fuel will be mingled with the moulded product at the same time it is dropped in the kiln at the top. As this kiln and machinery is slowly propelled over the highway, say fifty feet daily, there will be discharged from the bottom of the kiln the proper quantity of burned material to veneer the road with burned clay the determined thickness and width of track to be covered. If we have determined to make our road veneer nine feet wide and eight inches thick, then we must use six cubic feet of material for each foot of road passed over.

Fifty feet of road daily would call for three hundred cubic feet of burned product.

It will take about eight solid yards of clay in the roadside ditches to make daily this three hundred cubic feet of burned product or fifty feet of road daily.

In three hours' time the molded material would be dried out after being deposited in the top of the kiln, on account of the extreme heat coming up from below, and in from six to eight hours the water-smoke will be drawn off and in twenty-four hours thereafter the chemically combined water will be driven out. More time must be allowed if a burn approaching vitrification is expected. It is quite likely that this kiln should hold more than twice as many cubic feet of material as we want to produce daily, so that we can retain the mass under the heat fully forty-eight hours.

—Cost of Production.—

Some question may be raised as to the quality of fuel consumed in such a kiln. Our experience has been that one pound of good soft coal will burn four pounds of clay or shale to vitrification in our common round or square down draft kilns, taking such kiln cold to start with. In a continuous kiln which utilizes the heat much more perfectly, using as it does the escaping heat to dry out and water-smoke the contents of the kiln, one pound of good clean coal slack will burn fifteen pounds of clay into well-burned brick. Since twelve hundred degrees of heat is all that we require in our proposed burning, and since we too shall utilize the escaping heat, we can reasonably expect as good results as in a continuous kiln. One hundred and twenty tons of good soft coal will burn clay enough to make one mile of roadway ten feet wide and eight inches thick. One team, one machine man and two clay diggers will make all the force needed to run this traveling kiln.

I might add much more in detail as to the manner of propelling this kiln forward as the burning proceeds, the plan or running the clay through the augur mill, the plan of cutting the stream of moulded clay into short pieces, and then elevating these short pieces to the top of the kiln, when necessary, the proper method of discharging the burned product as the kiln moves over the roadway, the weight and probable cost of such a kiln, and many more pertinent enquiries, but this must suffice.

I have submitted the barest outline of this jointed, self-propelling, clay-consuming monster, as I have much faith in its practicability.

In the near future I shall expect to see one or more of these traveling kilns at work in a single township, preparing roads in the rural districts which will be far superior to the present dirt roads now in use, and which roads under the wholesome treatment that shall be given them by an enforced use of wide tires, aided by proper drainage, will be model country roads at a minimum of cost.

President Purington: Gentlemen, this paper is open for discussion.

Mr. Pike: Mr. Plumb speaks of manufacturing this material for roads, first molding it by machine, and then burning it in portable kilns. Now, there is an object in running the clay through a machine before burning it. After the product is burned, the finer it is the better it will pack down under those wide-tired wheels. You take broken tile and put them on the road, and they will crush up quite fine. It seems to me if you get this ballast in the same condition it will be all the better.

Mr. Plumb: The rapid drying these clays would receive—the drift clays of this country which we would have to use—would carry out your idea. Without the drying they would pulverize. The very moment they were exposed to the extreme heat it would go to pieces, and when cooled it would disintegrate or pulverize.

Mr. Billingsley: I have had a little experience along the line of wide tires myself. I do not think there is anything we can do to better the condition of our roads in this country more important than the use of wide tires. At first it might seem rather expensive to make this change, but you can get a full set of wide tires fitted to any wagon for about fifteen dollars. I have a set for the wheels of a two-horse wagon; they are five inches broad, and I would not have another tire on my farm, for it does not cut the soil; and I think if the farmers of this country would realize the truth of this they would not want to use anything but wide tires about their farms and in hauling. And the advantages to the roads would be so beneficial; it would meet with general approval every way.

Mr. Eudaly: Has anyone here ever used these wide tires on mud roads?

Mr. Billingsley: I have used mine.

Mr. Elder: In regard to wide tires, while our experience with wide tires has not been very great, we use two wide-tired wagons, one four-inch tires and the other three-inch. We like the three-inch tire much better in muddy weather, as it does not gather so much mud, and does not drag so badly. We think our wider tires will pull almost one-third heavier in muddy roads than the narrower tire. Mr. Plumb's idea is to have wide tires and then not have the wheels track. I do not think that would do at all in muddy roads. A team could not haul a wagon over such roads as we have in Illinois. I do not think it would be advisable.

Mr. Plumb: My idea is this: You are aware that a loaded wagon with narrow tires passes along over soft places and one wheel will enter immediately after the other, so that the road is given a knifing process. You may not be able to haul your roads so easily, but it is not the saving of teams I am after; I want to pack the road, and I want the tire wide enough to pack it properly, and I do not want the next tire to run immediately in the same track, unless it be a very wide tire. With such a tire, every time the farmer used the road he would improve it, and not destroy it.

Mr. Eudaly: If we could have all the lanes and by-ways and cross-roads of this brick material at one time, so that from the time a man started out until he returned he would travel on the same kind of road, it would be satisfactory. My judgment in the matter of wide tires is that it is a very difficult thing to get along with. A wide tire on a gravel road strikes every rock on the road. If we have two wide tires not tracking, they would be sure to strike every stone in the road. There would be such a small pro-

portion of the road made of this burned clay that the farmer would find it exceedingly difficult to use wide tires all seasons of the year. I was very much interested in the paper, for the reason that I want to make a little road. Gravel is too far off, and so is brick, and I have wondered how to make this road. I have heard a great deal of burning clay in the way talked of; in fact, I have seen it along railroads, but I have never looked into the matter. I have plenty of wood and plenty of clay, and I want to know whether I can successfully, with a reasonable amount of expenditure, burn this clay with wood so as to make such a road.

Mr. Batley: Mr. Eudaly is just the man to start an experiment with this burned clay problem. It might be a good thing if properly handled, but my experience in burning clay with any coal discharged from the kiln that is not passed through any greater degree would be absolutely worthless as a paving material. It would become soft again as soon as exposed to the elements. There is not a brickmaker in this Convention who does not know that to be a fact. Any of the gentlemen burning paving



WM. STARE, Treasurer, Mendota.

brick run from twenty-four to thirty hundred degrees of heat. You take your brick from the bottom of the kiln, or any part of the kiln that has not been subjected to more than fifteen or sixteen hundred degrees of heat, and they will pulverize. Another thing I should be doubtful about would be making these small tubes and dropping them into the top of the kiln. Some one suggested the use of a pulverizer. It would not be necessary. Any kind of tile formed into shape and dropped into that kiln would pulverize itself in fifteen minutes inside of that kiln. And, going in that degree of heat, that kiln would not run forty-eight hours without becoming thoroughly choked up. Mr. Plumb, I have no doubt, has gathered some of the material which he has worked from from the process of cement-making which is used in this country. I may say in the last year I have been giving great study to the burning of cement for the American Clay-working Machinery Company. Cements are burned to-day in this country very similar to the methods our friend has de-

scribed. Handling clay and cement are two entirely different problems. One is composed of rock and marl. You might strike some countries where the clay would contain sand or shale that would stand dropping into that heat. Mr. Purington's shale would probably stand it. Another feature: In regard to wide tires I agree with Mr. Plumb's idea of making a good road and then keeping it good by using wide tires. Many of you gentlemen have traveled in Europe—some of you have come from there. Many of you know there are laws there compelling the use of six-inch tires on wagons. I do not suppose during this summer there were more than twenty days out of ninety that it did not rain there, and I did not see on any of those roads enough mud to go over the sole of my shoe; but you must have a good road before you can use wide tires.

Mr. Plumb: If you had followed the paper closely you would have seen that it would perhaps be from twenty-four to thirty hours before the clays got down to thirty-two hundred degrees, and several hours after it is dry. It is twenty-four hours before the clay is used to that degree of heat, as my estimate would show.

D. V. Purington: How long do you think it would take to complete the burning?

Mr. Plumb: I think we could hurry it through the drying and cooling and carry it through the burning process in fifteen hours. The paper stated it would be proper to expect to keep the clay within the kiln at least forty-eight hours, and a longer time if you wished to bring it to a state of vitrification, so it would not go to pieces quite so quickly as Mr. Batley suggested. This is all a theory. I have seen no such kiln; it is all practically in the air, and yet from just such things as this, with a little experimenting, we can derive unexpectedly good results.

Mr. Eudaly: Is it your idea to have the fuel and clay fed into the kiln at the same time?

Mr. Plumb: Yes, sir. One remark in regard to Mr. Eudaly's criticism of the wide tire hitting the stones. I would want to hit that gravel, and keep hitting it until it got pressed down and out of sight.

Mr. Purington: I was very much interested in Mr. Plumb's paper, but there are several things that strike me as being very impractical. He proposes to use about eight or nine yards of clay every day. That would necessitate, to do his work, clay that would weigh thirty-five tons. Now, that added to the weight of the kiln used in burning it, and whatever apparatus attached to it, would, in my judgment, make an impossible load to move along a country road. In my opinion, if anything of this sort is ever done, it will be done by burning in permanent kilns. You can take the clay to the kiln easier and cheaper than you can move the kiln and machinery. Small plants might be erected throughout the country, where there is clay, and it could be made much more economical than by this portable kiln system of Mr. Plumb's.

Mr. Plumb: You did not get as much weight in the operation as I did. I thought about fifty tons would cover it, and I do not look upon fifty tons as anything very serious to propel over the country roads, even if they were soft. We move buildings heavier than that. If that were the only difficulty, I would feel greatly relieved.

Mr. Purington: In addition to that, there is no permanency to the plant, and your labor would be sort of temporary;

everything would be impractical, and you could not get the same results as from permanent plants.

Mr. Plumb: You might say an excavating machine is not permanent. It excavates where the excavating is to be done.

Mr. Stoll: Mr. Eudaly asked a question about burning the clay with wood. I have never seen that done, but I have seen it burned with coal. They dug up some of the clay and threw it out over a certain width, and then put so much slack coal on it, and then some more clay, and then coal, and so on, layer upon layer, until it is about eight feet high; and then they will fire one end and let it burn. They use this for ballast on the Burlington road. I have seen it along the Missouri river north of Kansas City.

Mr. Eudaly: Ballast, to be pushed down between the ties of a railroad, is quite a different thing from material to withstand travel. I want to find out whether I can make this stuff profitably with wood. I have plenty of clay and plenty of wood. The wood is going to waste, and I need the road.

J. M. Mamer: I think ballast would stand on a road. Take the railroad where ballast is used from here north on the Wabash. It is ballasted with cinders, and you can go over the track after a rain and a couple of trains have passed over, and there is a continual churning of the water in the cinders, and the frost and the rain and sun have a continual tendency to disintegrate, and I think anything that will stand for ballast on a railroad will stand just as well on a country road.

A. L. Solfisburg: What I want to know is whether you can burn any kind of clay as well as gumbo. In Iowa they use the black soil, and they burn coal with it. You take the gravel on the average country road, and if you do not pack it down and have a good foundation, in the spring, after the heavy rains, the gravel will go down out of sight, and it would be the same way with the burned gumbo. If it is not packed down well it will grind up and blow away like sand, if it is made like ordinary railroad ballast.

Mr. Walker: Mr. Eudaly wants to know about burning with wood. A man in our city had a furnace in his house and he wanted to burn it as cheap as possible, and he took the very finest of coal dust and went to the brickyard and got some clay, and made chunks of clay and mixed the coal dust with it, and burned it in his furnace, and he burned it all winter, and I live close to him, and the clinkers that he got out of the furnace he put on the road, and it has made a good, hard, solid road. And he said he never run his furnace so cheap as he did with that coal dust and clay, just burned in a common furnace. I do not know how much heat he got up, but he has a big house, ten rooms or more, so I guess he must have got a good deal of heat, and then made a good, hard road of the clinkers.

Mr. Purington: Does your neighbor still continue to heat his house in that way?

Mr. Walker: Yes, sir.

Mr. Converse: Mr. President, I do not know that I have anything to say, but inasmuch as I have addressed you several times without being recognized, I feel as though I ought to get up now. The best kilns that I know of are Eudaly's and Pike's, and if there is any other kiln men here in the house, I want to include them. [Laughter.]

Mr. Pike: Does it cost us anything?

Mr. Converse: No, but I was thinking

Eudaly's and Pike's kilns are hardly movable, although they move themselves a little at odd times. I do not want to criticise that paper; there is a wonderful amount of thought in it. Brother Purington says it is impractical. I think so too. I think it is a very suggestive paper. I do not see why this material could not be burned in these kilns—I do not care whose—so it could be broken easily and made into good ballast for roads, and perhaps with a foundation of hard brick, say two inches, and then this sort of ballast on top. I do not see why it would not make a good country road. The time was when they wanted to bring the mountain to Mohammed; they wanted to get them together, but they finally had to take Mohammed to the mountain. I believe it will be easier to move the clay than the kiln. There was no suggestion made for the purpose of moving the machinery along with the kiln. Still I believe the paper contains suggestions that will bring forth fruit. These kilns have got to be substantial, and they have got to be stationary. Mr. Eudaly asks about burning with wood. I do not know just how this ballast is burned, but I understand excavations are made somewhat after the method of burning charcoal. Now, I have never seen it done, but there is something in it. Railroads are



J. M. MAMER, Campus.

doing a great deal of that work. I want to tell you that in Springfield (everything that is good starts in Springfield) there is an old gentleman who has a contrivance by which he concentrates the rays of the sun, and he says he can burn the earth four feet deep right along in the road, and if he does that, I want to tell my Brother Plumb he is not in it. [Laughter.]

Mr. Townsend: I have been waiting for some one to speak who had more experience than I have had, but I have heard no one as yet. I say Brother Eudaly will not have any trouble in burning his clay with wood. I have not burned with coal, but I have with wood, and I think it can be done. I would start from the ground with six or eight inches of clay, cross it with six or eight inches or a foot thick with wood piled cross-ways, put on clay six or eight inches or a foot thick, and then put another layer of wood, and I believe it will burn that clay hard enough so that the frost and water or weather of any kind would not affect it.

Mr. Eudaly: I have listened to all that has been said with much interest. It is a matter of dollars and cents with me. I think I will pay twenty-five cents a ton

for gravel rather than get my wood and clay together and burn them. I think it will cost me too much. I do not like Mr. Batley a little bit, because he thinks I am the man to try this experiment.

Mr. Ashby: I have noticed nearly every one who has spoken are mere theorists, and have referred to experiments that they have seen in the burning of ballast. I thought perhaps it would be interesting to hear a man speak who had actually done this thing. Twenty years ago I burned thirty or forty yards of ballast, and I made roads with ballast. It is done by throwing the clay up, putting a layer of coal (I do not think, by the way, that wood would be suitable), then a layer of clay, and then a layer of fuel to about six or eight feet high, and then burning, and you get burned clay ballast, and that is not hard enough to make a good road. You get a sort of a salmon brick, and you do not have to break the chunks of ballast up a little bit, and there is some work about that, and after having it down six months you will find you will have to put another layer down, and you get a good foundation, and after you have done that and burned another heap of ballast, and you have six inches of good hard-burned clay or ballast road. You will find your surface is so soft it is always cutting up with a very small amount of traffic, and you have a muddy road. I think Mr. Batley will bear me out that you cannot make a good road with clay burned that way.

Secretary Stoll: We will pass to the next paper on the programme:

TILE DRAINAGE AS AN INVESTMENT.

By J. J. W. Billingsley, Indianapolis.

We claim that tile drainage will make the soil open and porous down to the depth of the underdrain; will make the soil easy to break and prepare for planting; that the soil will require much less labor in cultivating the crop, the soil being fine, open and easily stirred; that the roots of the crop will penetrate the soil so deep that the plant will make a more vigorous growth and will better resist the evil effects of drouths when they are so damaging to crop growth and maturity.

We claim, truly, that the thorough under-drainage of the soil removing effectually the excess of water will increase the temperature of the soil eight or ten degrees, which enables the farmer to plow and plant sooner, insuring a better germination of the seed, a better stand and a better maturity.

We claim, certainly, that the open, porous condition of the soil, well drained, admits the air to circulate through it, the air coming in contact with the particles of soil will produce chemical changes of vast importance in the preparation of plant food; that the water of rainfall in its passage through the air will take up fertilizing gases and give them up to the soil and sub-soil in its passage through the drains.

We may further claim that a well-drained soil will conserve the moisture in the air by causing it to condense and adhere to the fine particles of soil in the passage of the air down to the drain. Besides, there are other benefits which might be named to advantage, but with practical men the question will be, Will it pay as a money investment? That is, will the money expended in thorough drainage add so much to the betterment of the soil that the increased yield of the crops grown bring in the market so much more money that the money invested in the drainage of the land will pay a satisfactory interest one year with another, other things being equal. For instance, if A has forty acres of land from which he has had an average yield of thirty bushels of corn for the past ten years—some years more and some years less—if he underdrains the land thoroughly, will the increased yield of his crops for the next ten years, with good husband-like care bring enough more in cash to pay a satisfactory interest on the investment?

This is the question which we undertake to answer. It is not enough to say "yes." The practical business man wants the fig-

ures showing the cost and the returns.

In solving the question suppose that we take A's forty acres of land, which has been in cultivation for the past twenty years. It will be admitted that the virgin richness of the soil has been to some extent exhausted. The soil is now of average quality, the humus has been washed out until it is easily compacted, and breaks up cloddy after a day or two of drying weather; it often requires repeated harrowing and rolling to make it fine and ready for planting or sowing the seed. During the season of cultivating the corn crop if the weather is rainy the soil is seldom in condition to run the cultivators. If the season turns off dry then the cultivation will be difficult because of the hardness and cloddy nature of the land, and if the dry weather is long continued the crop will be greatly damaged.

Exactly this condition has prevailed for the past few years. Some seasons the yield has been cut fully fifty per cent. and then when the season was favorable the crop yield was much above the average.

When "A" completed the tile drainage of forty acres, the cost figured up as follows:

Drain tile, 26,400 pieces, cost.....\$400
Digging the drains and laying the tile..... 400

Total cost.... \$800

Cost per acre, \$20.

In this estimate 660 pieces or forty rods of tile are required to the acre, the drains being 66 feet apart, the tile costing \$10 per acre. It is also estimated that \$10 will pay for the digging and laying of the tile and complete the work. We are aware of the fact that in some localities the construction of the drains will cost more money and in other localities less. We think the sum named fairly represents the average cost of laying drain tile in this State (Illinois), and in many localities in other States.

The work of draining the forty acres being completed, "A" has an investment of \$20 per acre, or \$800 in the forty acre field.

After completing the work "A" cannot reasonably expect to grow as large a crop the first year after draining the land as will be realized the third or succeeding years. A year or two is required to make the soil open and porous between the drains, especially midway between the drains. So we take a period of ten years and take an average crop as the basis of calculation.

If the crop grown is corn we may reasonably expect a yield of forty bushels per acre, or an increased yield of 25 per cent. The land will require 25 per cent. less labor to break and prepare it for planting. If the plowing is done in good season the soil will turn over so thoroughly pulverized that a single harrowing is all that will be required to make the seed bed as good as can well be desired (If the soil has not been trampled with stock). In some instances we have known the soil so fine and mellow when broke that the planter followed close to the breaking, and the better condition of the soil facilitates the work of cultivating the corn. The work of cultivation may go on in a few hours after a heavy rainfall, when the land is well underdrained. We might claim a credit of \$2 per acre in the less labor required to plant and cultivate the crop, but will not include this very satisfactory credit. We will estimate an average increased yield of ten bushels per acre, which at 20 cents per bushel makes the sum of \$2, which would be 10 per cent. interest on the money invested in drainage.

We will compare it with other investments. One thousand dollars in bank stock that will declare a dividend of 10 per cent. per annum will command a premium of 40 per cent. or more. And the \$1,000 in bank carries with it a liability to lose the stock and \$1,000 more in the event of a bad failure of the bank.

In the investment of the same amount of money in tile draining the land there is no liability that the bank will break or that the value of the investment will be impaired. The investor may draw upon it certainly every year if he desires, and so long as he lives, and the generations to follow may do the same if they till the soil in a good husband-like manner.

Or suppose we invest a like sum in railroad stock which has been declaring 10 per cent. dividends. We will have to pay ordinarily 40 or 50 per cent. premium; here our investment must take the risk of a change of management or labor strikes or failure of crops so that dividends may not be forthcoming at all, and not infrequently a heavy loss on the investment.

It is not so with investments in draining farm lands.

If seasons are unfavorable for the production of maximum crops the country over those grown on soils which are thoroughly tile drained will by far exceed those grown on land not tile drained.

When extreme drouths prevail it is quite

common to see corn through which the drains may be located by the better growth of the crop, over and near the lines of the drains.

We have been conservative in our estimate of the profits that may be realized from an investment of money in the underdrainage of farm land. It is very probable that there are those present who have realized much larger profits from money invested in drainage.

A gentleman of large experience in farming and stock raising once remarked to the writer as follows: "I am getting old, have seen men borrow money to buy land or to buy stock and it is quite common to borrow money to build a big house, and I have known all these to lose not only the borrowed money, but all they had, especially when they wanted to build big houses, but I have never known a man to fail who borrowed money to underdrain his land so that he might grow good crops every season. Some way he always digs out."

He was right. The well underdrained soil never disappoints the good husbandman.

There are thousands of farmers who can truthfully tell you that the money and labor which they have expended in underdraining their land has paid them fifty or one hundred per cent. annually.

But you will pardon the writer for digressing somewhat from the line of his subject to direct attention to the fact that there are very few farms which have been thoroughly tile drained. Farms are frequently represented as being well tile drained when in fact all that has been done has been the drainage of the low places in a field by putting in two or three lines of tile drains and nothing more. All the remainder of a forty-



J. J. W. BILLINGSLEY, Indianapolis.

acre field is not in the least benefitted by what has been done.

Only a few days ago the writer was addressing a large farmers' meeting on the subject of farm drainage, and to ascertain how far they had advanced in the underdrainage of their land, we requested those who had drained any area of more than one acre in putting in drains four rods or less apart, to raise their hands. Not a hand was raised. Then those who had underdrained a field large or small thoroughly with drains one hundred feet apart were requested to raise their hands and not a hand went up. Yet it is true that a great deal has been done in that section in the way of draining out the wet places, but no thorough work. But why not more thorough work? Is it a want of confidence in the investment? Certainly the return of profits from drainage have been satisfactory. Certainly no investment of money and labor could be more secure or permanent, or yield a more satisfactory dividend. Brick and tile plants have to be repaired each succeeding year and even then there is a rapid decrease in value. But money invested in tile drainage, though out of sight, is held at a premium and is as certain to disclose a satisfactory dividend as the seasons are to come and go.

Men, even farmers, grow restless when they read the fabulous wealth on the Klondike, and are willing to expose themselves to the perils of an Arctic winter to gain it, when the same money expended on the farms in the sufficient underdrainage of the soil will bring them a tide of prosperity which they have not known and possibly as much in the end as could be secured in the gold mines and at the same time enjoy the comforts of home and the pleasures of civilized society without any hazardous risk of health or life. [Applause.]

President Purington: There is present a gentleman who in former years has done a great deal for this Association, and has done a great deal for the craft through the columns of the Clay-Worker. I would be glad to hear from D. W. Stookey, Cedar Rapids, Iowa. [Applause.]

Mr. Stookey: I was not expecting to be called upon on this occasion, or in fact any other occasion, and I thank you for the kindness and the confidence. The facts are just about as Mr. Billingsley has stated. As an investment I do not know of anything that is as devoid of uncertainty as that of tile drainage. And while some of you may have thought that the Klondike would bring in larger returns than tile drainage, this thought came to me, and there is where the temptation comes in; but I have no doubt the same course of reasoning will stand good in the Klondike statement as proved to be the case in the days of '49, when the California craze was at its height. While one man found his millions there were millions of men who found their graves. So, while you invest a dollar and give it a fair trial, I honestly believe more money will be made by carefully tiling our rich soil than can be made by the same class of men and the same amount of money used in speculation. It has been said that the farmer is an honest man, and he is slow—and he surely is slow—and he is careful to a fault. I have been thinking a little along the line of real estate as well as tile-making and clayworking in the last few years, and I have wondered quietly to myself that the farmers will hold land that you ask them to sell and offer \$65 to \$70 an acre for land that is going to waste. It does not pay the interest on the price they ask for it, and yet they claim to be doing business for the money there is in it. They are just as anxious to be rich and just as glad to have more money as anyone, and yet they will sell their land or let it go to waste rather than take the risk of borrowing money with which to pay for the tiling. I have made up my mind that I will induce people to tile drain. One of the things I will say to them will be: You are farming for money, just as anyone else is in business for money. If you are farming for money, farm in a way that will bring you in money. Then point out to them their wet lands, and then show them that they are getting nothing for them, and any intelligent farmer can see that you are right. They are intelligent enough; that is not the trouble. A man cannot be a farmer in this day and age unless he is a thinking man; but the trouble is, they are too conservative. If a banker or a business man in town could borrow money at 6 or 7 per cent. and make 25 or 100 per cent. on it, he would go crazy in trying to borrow all he could get at that rate. I know a man to whom I am anxious to loan money at 6 per cent., and just over the fence is a neighbor to show him that tile drainage will pay for itself in a short time, and this man has not the courage to borrow money to drain his land.

D. V. Purington: This is one of the topics that Endaly and I are left out of, and Converse, too; but we have a member of this Association who has sold out his tile factory and kept his tile, and yet he has bought more tile this year than any other man in the country. Let us hear from Farmer Pike.

Mr. Pike: I would like to know what all this controversy is about. Is there anyone here who says that tile drainage don't pay? All tilemakers and users of

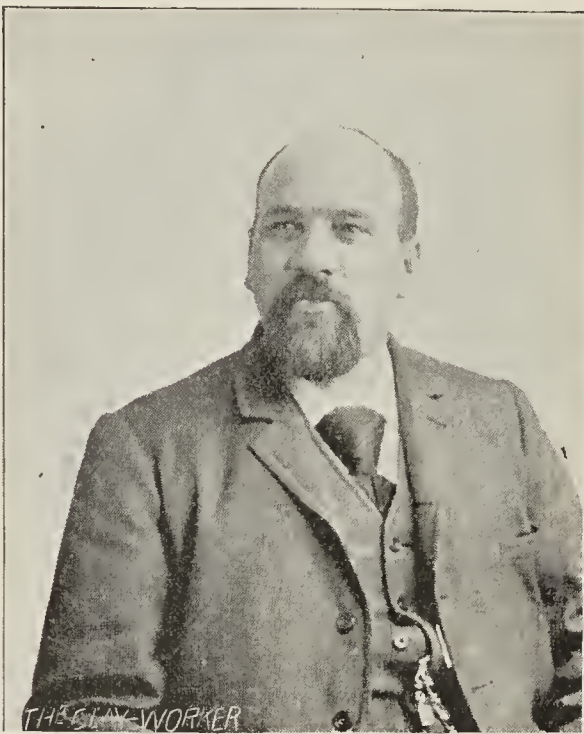
tile who are here who say that it don't pay. will they stand up? [No one rose.] It is settled, then, that it does pay. The paper read by Mr. Billingsley sets it forth in that way—and, by the way, I have a paper to-morrow, and friend Billingsley has taken all my thunder. Wonder what I got up to talk about! I want to say to you that tile drainage does pay. If I had a mortgage on a farm that I wanted to lift, the best way would be to drain it off. Put in tile, and put them in deep enough, and put enough in to drain it off. It does not take any great amount of experience, but it does take a lot of money and a lot of work and diligence, in season and out of season. I have had some experience in tiling, and my experience is this: that the low ground that we have in Illinois and in Indiana, and all other places where the soil is non-productive of anything but fish and snakes, that all we have to do is drain them and get good results. This subject has been discussed here time and again, and there is no use discussing anything where everybody is convinced and considers it a fact—particularly us Illinois folks. Over in Ohio they do not know anything about it, and they come over here to learn about it, and we teach them.

Mr. Billingsley: I want to talk a moment or two on one point. I understand why he is so embarrassed in making his speech on drainage. He is afraid that he will make his speech that he has prepared for to-morrow. [Laughter.] There is one point I want to emphasize, and it is this: I really believe that the men who are engaged in the manufacture of tile could do a great deal more in creating a public interest in this matter of drainage than they do. The work that has already been done in the interest of tile draining is only a beginning. In my State, and I expect it is the same in Illinois, you buy a farm that has some tile drains on it; they will tell you the farm is well drained, and there are probably not more than a dozen lines of drain tile upon it, and yet they will insist that it is well drained. We want to educate the public mind up to the fact that this is but the beginning, and the manufacturers of drain tile can do a great deal along this line if they will. Excuse me for talking a little plain on this matter. I have thought this matter over a great deal, and in some way or another, I care not how—you can do it through your local press or your farmers' institutes—you must let it be known that what has been done is but the beginning, and the farmers must carry out the work and cover almost every foot of land that is not underdrained. The use of drain tile will add very much to the common prosperity of the country, and do not let us lose sight of what has been done, and do not let it stand in the way of what ought to be done in the future. Some men, in doing what they have done, have not done it well, and they do not like to take it up.

Mr. Endaly: I want to follow up this matter. To satisfy Mr. Purington, I will say that I own several thousand acres of farm land, and it is well tile-drained, too. I heard Mr. Billingsley read a paper on this subject over in Ohio several years ago, and I made up my mind that I would experiment a little, and I would try this drainage, and I did. I put in a great many carloads of drain tile, and I went to the Ohio Convention and I told them what I had done, and I came to the Illinois Convention and did the same thing. I thought probably it would be interesting to the manufacturers of tile, in a way, and it would do a great deal of

good—and do you know, neither of the Associations took any notice of it. It was not even mentioned by any of the papers in their reports of the Convention, and no one ever asked me whether it was a success or not. So I came to the conclusion that, while we come here and talk about these things, after all, we are not very much interested in them.

Mr. Pike: This seems to be rather a threadbare subject, but the more we talk about it the less I think we know. I had an experience over in the State where the Father of Drainage lives—Father Billingsley, you know—he is the head of us all. I went over there and bought a piece of land. And a neighbor called on me, and he said: "What are you going to do with it?" and I said: "The first thing I am going to do is to tile drain it and get the water off it, and make a decent place of it." He said: "My man, you must be very careful about this tiling business. In that way you can put more money under the ground and see less of it than any other way. You can put money in a house and barn and see it, but you can bury it and not see it. Have you had any experience in tile draining?" I did not say anything; I was sort of paralyzed. "If not," he con-



WM. HAMMERSCHMIDT, Lombard, Ill.

tinued, "you had better go slow and be careful. Better see some one who knows something about it." I said: "Well, I have had some experience. I have been making tile about seventeen years, and put in some tile on my own land, and I think I will put in a couple of strings over here. Do you think it would be reasonable?" Well, I went on, and I put in there this fall a little over eight miles of tile, and this man comes over to see me, and he looks at me like he thought I belonged to Mr. Barnum's menagerie. He came over after I got the eight miles in, and he said, "How does the tile work?" and I said, "I will have one of the boys hitch up the old horse and we will go and see." By the way, they told me there was no fall to the land, and I found there was about six feet to the mile. We went down to the river, where the water was running from one of those tile buried about two and a half feet under ground, and he said: "How do you know the water comes out the tile?" I said, taking up a long pole: "Take that stick and put it down there," showing him how to push it down in front of the mouth of

the tile; and he did so, and the rush of the water carried it away. He looked surprised and said: "What does that? Where does the water come from?" They he asked a lot more questions, such as: "How does it get into the tile?" "Does it get in through the joints or seep through the tile?" and I began to think they do not know much about drainage over there, and if I stay there three or four years longer I will be able to teach them something. The more tile we have the less need there is of being careful.

Mr. Converse: If there are any of you who want to borrow any money, I can tell you where you can get it. It is from a man who borrowed \$3,000 of me several years ago. He wanted to improve his land, and wanted to know if I wanted any security. I told him I thought it would be well, and he brought the note around with thirty-five men's names to it—it was the longest note I ever saw—and he went to draining, and if any of you want to borrow any money, you can get it from that man. Now he has money to loan. He bought a lot of swamp land and he ditched it. He has got the money in his pocket. He went about tile draining in a systematic way. He is one of the richest men in the county, simply because he went at it with intelligence.

Mr. Cunningham: The thought presented itself to me: We have a great many other papers to be read before the Convention, and they are published in our magazines, and are distributed amongst the tilemakers; and it occurs to me that if the tilemakers and manufacturers of clay products would take these papers—the same as the machine men take the letters from their customers and mail them to prospective buyers—and mail them to farmers, and conduct a campaign of education, it would be a great move in the right direction.

Mr. Stookey: I want to say something in regard to a word Mr. Pike let fall. He said this question was a chestnut, but if he will crack it he will find there are no worms in it. I said the farmers were slow; now I say the tilemakers are slow. I believe if the tilemakers would spread their knowledge and advertise it as other industries are advertised, they would profit largely. We have not been hustling any more than the farmers have.

Secretary Stoll: This brings us to a paper by William Ammann on "New and Old Brickmaking." I understand Mr. Ammann himself is out of the city, but his brother is here to speak for him.

Henry Ammann: I am sorry that my brother is not here. It seems he thought prosperity had struck us, and so he took a life partner and is now South spending his honeymoon. He promised to show up yesterday, but he did not come. I have prepared a paper in a few hours. I thought you would not care for much of a paper, as the subject would be open for discussion.

NEW AND OLD BRICKMAKING.

By Wm. Ammann, Decatur, Ill.

Mr. President and Gentlemen of the Convention: Mr. Stoll spoke to my brother, asking him for a talk on brickmaking as it is done in Decatur, and he consented, but in the meantime he has taken unto himself another partner (which would seem impossible at the present prices of brick), which keeps him from the city at present.

We, as well as all other brick-makers of Decatur, use the stiff mud machines, which we think is best for our clay. One of the most important points of our brickmaking is

having the clay in proper condition in the bank, so that when it comes to the pit it can be carried to the crusher without any, or very little water. If our clay has dry clods in it, it will be noticed all the way through; even after being burned it can easily be detected. While a pug mill would overcome these clods, it is my opinion that the brick made from clay soaked from one to two weeks ahead in the field, and going direct from the crusher to machine without any water is the most solid brick we can make.

Now a few words as to our drying our brick. It requires from seven to nine days to dry our brick thoroughly, as our clays will not stand fast drying. And I will say right here that the brick in our summer sheds dry smoother and are nicer in appearance than the brick that are dried in the steam sheds. The brick are also larger and weigh heavier than those dried in the steam shed. If any one can give us any reason for this I would like to receive it. Decatur brickmakers have not been able to discover the cause.

Now as to burning: For our building brick we use kilns something on the order of the Wingard kiln, somewhat improved by our own ideas, which enables us to burn any part of the kiln when so needed. Thus we have a kiln evenly settled from head to head and end to end, and burned to suit the trade. We watersmoke with wood, which requires about six days; much depends upon the condition the brick were in when they were put in the kiln. We then finish with coal. In all, it requires from ten days to two weeks to burn a kiln of building brick. Our paving brick are burned in round down-draft kilns, which require about eight days' burning, and burned altogether with coal.

—Delivering the Brick.—

Delivering brick in Decatur, and to deliver them right means a great deal—perhaps more than some brickmakers think it does. It is very easy to tell your teamster to back into the kiln and load up a load of brick, but will he load the right brick for that certain work? It is my business to watch and see every load of red brick that leaves the yard, and see that it is the right color and matches those which have gone out ahead of it for that particular job. It is very easy to send out red brick where the kiln is evenly settled and has not been too hot some time or another, but it seems as though we cannot burn all that way, the kiln getting too hot some time. Then is when we have to do our figuring, as we have two or three shades of red brick to handle, and right here is where the trouble comes, if we do not watch closely, from the contractor or owner of the building. It is equally important to deliver brick to the contractor, no matter how small the job is, just as the contractor orders them. If he orders eye brick, give him eye brick, and if he orders soft brick don't send him a load of red brick. It is true that some contractors would continually call for straight eye brick, or red brick, but it will not take long for the brickmaker to find that out, so that when the next order comes he will inquire what they are going to be used for, and the brickmaker know what quality of brick should be used, and send them accordingly.

President Purington: Can anyone give Mr. Ammann the information he asks for? Who can tell what causes the air-dried brick to be larger, smoother and better than the brick dried by steam?

Mr. Batley: I should think that it arises from the fact that the air-dried brick are not as dry as the brick taken from the steam dryer. Consequently the difference in size. I have dried a great many brick out of doors, and we are always deceived as to what is a dry brick taken from the shed in the air. It looks dry, it feels dry, and is solid and sound; but, just the same, they are not really dry. The moisture has not been taken from them so rapidly as in the steam dryer, consequently the contractions have not been in proportion to what it would be. Now, when the brick are through both stages and the same degree of heat, whether dried out doors or in the dryer, I do not think there would be any difference, but I have noticed brick taken from shed under cover that they seem dry when set in the kiln. Hence my solution of the problem is they are not thoroughly bone-dry.

President Purington: That answers a

part of the question. What about the latter?

Mr. Loy: I think decomposed shale shrinks much more than common clay, even when made by the same process. For some reason there is some quality that belongs to the common clay that is taken out of this decomposed clay, and the heat removes this quality.

Mr. Mattes: I have had some experience along this line, and I believe that our brick dried by air are better than the steam-dried brick, from the fact that they are dried slowly. It takes four or five weeks to dry brick in the air or under the sheds, and the brick on the outside of the sheds are not as good as those in the center. The bricks are not larger when they are dried, but after they are burned. This is a point that we would like to have explained—why the brick dried naturally under sheds should be larger after burned than the brick dried by steam.

Mr. Randall: Do I understand the gentleman to say that the brick that are dried by nature's process are really larger after being burned than those dried by artificial means?

Mr. Mattes: They are considerably larger.

Mr. Batley: I would like to ask whether the brick are made by the same



W. A. EUDALY, Cincinnati.

process and out of the same clay, and are they the same size before being dried? Are the brick that go to the dryer piled on a car, or are they trucked? If you truck a soft mud brick any distance it will increase in length and width. It should not make any difference in stiff mud brick. This is undoubtedly a problem I have never run across. I have known the brick to be larger when burned than when made, but I have never known any difference resulting from the two methods of drying.

Mr. Ammann: The brick are made on an auger machine, are made out of the same clay, handled the same, and cut off the same.

Mr. Cunningham: May I ask if the brick come from the same part of the clay bank?

Mr. Ammann: Yes, sir.

Mr. Stare: My brick are set in hacks under sheds. About one-third of the sheds are steam-heated. Naturally, some of the brick are hacked close to the steam pipes, and some where there is no steam heat whatever. Of course, the brick hacked farthest from the steam pipes do not dry so fast as the others; they are two days or more longer in drying than those set close to the pipes, and these brick which are dried slowly are

from a quarter to three-quarters of an inch larger when dried, ready for the kiln, than those which are dried rapidly. They are made from the same clay and in the same way and at the same time, the only difference being in the drying. I think there is the same difference in size after the brick are burned.

Mr. Eudaly: I can understand, by straining a point, how that might be, that the brick could be a different size after dried and after burned, but the stumbling block to me is, why should they be different in weight? I have never thought of it before. I can see when clays are drying they move upon themselves, and it brings the entire body of the brick up to a smaller compass. I do not know it to be so, but rapid drying may compact the clay more and make it smaller, even if both were perfectly dry. I say I do not know this is so; but I do not understand why the brick should be so different. Of course, we have heard this discussed over and over again; therefore, it is no new thing to hear that brick not burned hard will not weigh as much as hard-burned brick. That has been demonstrated time and again, but I cannot understand the conditions that Mr. Ammann describes.

Mr. Plumb: I have had the gentleman representing the Weighmasters' Association come to our yard and weigh the brick, and we have had three different grades of brick coming out of the kiln, made on the same machine on the same day, and he has noticed no difference in the weight of the hard-burned, soft and medium-burned brick, and I have watched him in the weighing process.

J. H. Mamer: It seems to me that in drying by air and by steam the conditions are about the same as in open ground in the summer. When we have a heavy shower of rain, and the sun comes out shortly after and dries up the moisture quick, you know the ground will crack open in small sections. I suppose it is because it shrinks more than when it dries off slowly. It's the same at the clay bank. I have noticed it in ours—we work it on a long slope—that if we get a shower and the sun comes out hot and dries the clay quickly, it cracks more than if it dries slow. I think it might be the same way with brick.

D. V. Purington: I am advised that the man who is to tell us about "The Dividends" has arrived, and I know we are all anxious to hear from that man.

President Purington: The next on the programme is a paper on "The Dividends," by W. D. Gates, of Chicago. [Applause.]

W. D. Gates: I am sorry I did not get here a little bit earlier. I tried to get two or three men to applaud me when I came up, but those I spoke to were too busy. It is always pleasant to get the applause first, and then I am sure of it. If it comes later I am afraid I will not get it. I came late, Mr. President, and yet I came as soon as my creditors would let me. Some time ago your Secretary said he wanted me to come to the Convention and read a paper. Of course, he has confidence in the man who writes my papers. I rashly consented, and then I learned that the meeting was appointed for the fifth of the month, and I wrote him at once it would be impossible, as I would be figuring up how much I owed, and could not get away. He immediately wrote back and refused to untie the strings with which he had tied me, and suggested that I write on dividends, which was a very sarcastic piece of

work. It recalls to my mind one of the National Conventions. I had spoken to one of our representative Chicago brick-makers, and urged him to attend the Convention. I finally met him at the elevator one day, and I said: "Are you going to the Convention?" He said: "No, I cannot go, but is Smith going?" I said: "Oh, yes, he is going to read a paper." He said: "What! read a paper? Why, he don't know anything about brick-making." I replied: "It is time you attend a Convention. That is not an essential at all." I presume the Secretary followed out this plan. I recall that other Chicago man, who has become historic—you have all heard the story. He put up at an Eastern hotel, and was disturbed by the walking of a man who had the room above him. He finally went up and knocked at the man's door and said: "My good man, what is the matter with you? Why don't you go to bed?" The man said: "I can't go to bed; to-morrow morning at ten o'clock I have got to pay a man \$20,000, and I have not got it." Said our friend: "Is that all?" "Is that all!" echoed the man. "Well," said our friend, "you go to bed to-night and sleep nice and quiet, and to-morrow night he will walk the floor." So I concluded this would work in my case, and I left them to walk the floor. After receiving this subject of dividends—and I will say right now, before you leave the room, that I am not going to talk very long; you have had all you can stand, and while everybody knows that no clay-worker is a high liver, still I have my own high liver, and I have brought it down with me in the shape of a headache. I was extremely anxious that Brother Pike should catch that. I wish the stenographer would see that he does get it. It is pretty hard to make any remarks facing two such kiln men as I have facing me. When I concluded to wrestle with this subject of dividends, I began to wonder what dividends were. I had an idea I had heard it somewhere, and yet it had an unfamiliar sound. I went to one of the boys in the office and I said: "What are dividends?" He said, "Don't you remember we used to get them four or five years ago?" And then I remembered distinctly that I had known something about dividends. But the dividends we had then were different from those we have now. I do not know but that I have been singing this song so long through all the Conventions that I can never get away from it, but I have been singing the song of better times coming at the same time. I do not think it would be proper to say that our dividends are pecuniary dividends, but I think, while we have been short of the pecuniary dividends, we have been getting something, and if we can hold on long enough, pecuniary dividends will come in the future. Among clayworkers, the last few years, something has been established, and we have had dividends of something besides cash. We have had dividends of health (I wish I had not mentioned my liver) [laughter], and dividends of happiness. And I think, as a rule, that the clayworkers of this country—probably I had better say brick-makers; the terra cotta men have more tribulations than brickmakers—have had more happiness. I have an idea that, while we all like dollars, and while we use them, still we, as brickmakers and clayworkers, have an idea that we have got to get those dollars about right or they do not do us so much good. I believe that we all believe that a dollar that is stained and smirched and soiled, while it may be polished and look bright,

does not bring the comfort that the dollar honestly earned does, and I think we have all been earning dollars of this latter class the past few years. While I do not think we are any of us inclined to pile up a few dollars just to see how many we can get, but they represent more to us—we look upon them as something to bring comfort to our families. My business reminds me of the man who had hold of the bear—there was no place to let go. And there is no place to let go in the clayworkers' business. You have got to have such a force and such a plant that there is no place to let go, and we hold on, hoping for better times. I do not want to talk to you gentlemen on this. It is too late in the day. I can not tell you any more about dividends than you already know. They are remote with all of us. I say we have been piling up an experience—learning to economize, as a people; the whole country has been economizing, and we will get the benefit of it in the business that is coming. There has been an immense building boom in the East, and I look with a great deal of confidence for the Western movement of that building boom.

I am greatly embarrassed in the pres-



W. D. GATES, Chicago,

ence of this jury [laughter]. I can not talk to you as I would like to. I know you are all waiting for your supper and I am going to quit right here. [Applause.]

Secretary Stoll: The next on the programme is a paper by Mr. Bach, but, as you all know, he cannot be here. He wired me that he had mailed his paper and I expect to get it in the morning. It has been suggested that we now hear from Mr. D. O. Loy, who is on to-morrow's programme.

Mr. Loy: You will notice that I am on the programme for to-morrow, but a few of my special friends said they would not want to trust me after the banquet to-night, and I had better give my poem now. I selected this theme and read a poem entitled "A Tilemaker's Dream" several years ago, but our Secretary had probably overlooked this, so we will have to label this one "A Tilemaker's Dream" No. 2.

THE TILE MAKERS' DREAM.

By D. O. Loy.

Men may plan and may labor, with motives all pure,
Then get stranded in life at the home for

the poor.

The rich man may laugh while the poor beggar weeps,
But the happiest man is the pauper who sleeps.

Where pleasure comes only to mortals in dreams,
They waken to find life is not what it seems.
Though warm clothing he has and plenty to eat,
Poorhouse garments don't fit, and the vituals aren't sweet.

Last night as I lay on the county's hard cot,
I dreamed of the past and how happy the thought!
My heart beat with joy like a schoolboy at play,
For I thought I was mixing and molding the clay.

'Twas away from the home of the stern hand of fate,
And back to the place, where, once early and late
I had toiled with stout heart, and plied my whole skill;
In my dream I'd gone back to my tile yard and mill.

The moon had sunk low and its light was now gone,
And the dark hour had passed; 'twas the coming of dawn;
Now I scarcely can tel. which scene I love best,
The bright sun, or the moon, sinking low in the west.

saw the bright star; - heard the cock crow;
I heard the songs of the birds; then my own whistle blow.
'Twas a lovely spring morning, the sky clear and bright;
With promise of sunshine from morning till night.

My men were on band all prepared for their part,
They were waiting for time for my tile mill to start.
The engineer oiled up his engine and mill,
And my fireman stoked up the furnace, and kiln.

Long before the old engine was puffing off steam
We were loading with drain tile team after team.
The mails brought me orders from near and from far
For all sizes of drain tile—car after car.

My chimneys were smoking, my furnace did roar,
In my dream's flashlight picture of bright days of yore.
My heart beat with pride to the fullest degree,
For the world promised profit, and pleasure, to me.

Oh, sweet was my dream of those bright days of old,
When the farmers were filling my till with their gold;
Though my prices were high, they seldom would flinch
When paying for drain tiles, five dollars per inch.

Yes, I dreamt of the years when trade never was dull,
When a tile that was cracked was not counted a cull;
When we loaded our wares, sound, shelly or marred,
And the soft, whitewashed tile sold as quick as the hard.

When the farmers would come to the yard as a rule,
And camp on the ground for the tile to get cool;
And unwilling to wait for the wares they had bought,
Would load up and go while the tile was red-hot.

One "Jubilee" year, then all farmers were telling
Good fortune of tile-makers lavishly smiling;
While I walked through the works, inspecting my own,
How I smiled with delight, like a king on his throne.

"The work of the Gods; slow but fine grinds" their mill;
Pressing on, step by step I was climbing the hill.
Tilemaker was I, and proud of the name;
While mounting the steep hill of fortune and fame.

A ride to the country I seldom refused;
In my dream I rode out where my drain tile

were used;
On a thorough-drained farm I spent one
whole day,
Like sweet moments of time the hours
slipped away.

I strolled through the fields—'twas a fancy
of mine,
To locate a tile ditch; then follow the line,
Though the tile were all buried deep down
in the drain,
I could locate the graves by the size of the
grain.

A garden more lovely I never had seen,
While the flowers were all bright, the leaves
fresh and green.
And while all of the flowers were robed in
gay style,
That rose was far sweetest which grew next
the tile.

I entered the home; 'twas a picture of
wealth,
While each bright smiling face was a pict-
ure of health.
I knew that the blush on the cheek of the
maid
Would ne'er been so bright had not drain
tiles been laid.

We dined; and for me it seemed easy to tell
That the fowl of the feast drank from a
deep well.
For a whole hour or more, we continued to
eat
The food which my drain tiles made tender
and sweet.

I returned to my factory far into the night,
But the fires in my tile kilns were all burn-
ing bright;
And the face of the watchman beamed with
a bright look
As he showed me new orders for tile on the
book.

I thought I retired with new springs in my
bed,
And soft was the pillow I pressed with my
head.
In my dream my delight I scarce could con-
trol,
For prosperity ever brings joy to the soul.

I dreamt of a time—can I ever forget?—
When prospering tile-makers at Springfield
had met.
Were I sworn now, I could, like a witness
in court,
See each tile-maker smile as he made his
report.

By the fellows who made them, the red tile
were praised;
While fire-clay men men argued that tile
must be glazed;
The man who made red tile said gloss
wouldn't do,
Since the tile must be porous if water runs
through.

But with one accord we all boasted with
pride,
The demand for drain tiles could ne'er be
supplied.
Being charmed with our story of how to get
rich,
Scores of others began to make tiles for the
ditch.

Then it seemed there commenced a continual
drouth,
Till no water flowed out of the tile-ditch's
mouth;
Then I thought that the cranks began to
complain,
That our drain tile in use was preventing
the rain.

While I slumbered and dreamed one whole
year had gone by,
Drain tile at the yards were heaped moun-
tain high;
As the prices went down on the stocks we
had piled,
A mortgage, I thought, on the factory was
filed.

Then interest ate up all the money we made;
With profits all gone our bill couldn't be
paid;
Long before all the tiles had been carted
away,
Our doomed tile factories had gone to decay.
"With the crow of the cock, the song of the
bird,"
The tile factory whistle no longer is heard;
No watchman by night; the furnace is cold;
The mortgage foreclosed; the factory sold.

I thought in my dream that the century new
Had arrived, and that tile and tile-makers
were few.
Though I searched for a pool on the top of
the ground
To cool my hot brain, it could nowhere be
found.

Where the swamp used to be, the golden
grain grows;

The pond's now a garden with sweet bloom-
ing rose;
Since the orchard is tiled, no one can dis-
pute
The blossoms the brighter; more luscious the
fruit.

Sweet and juicy the fruit on vine and on
tree;
Since the rainfall through tile starts back
to the sea;
And children born now are healthy from
birth,
Since the swamps have been drained from
the face of the earth.

Even cranks, slow to learn, see after
awhile,
No physician on earth is as good as drain
tile;
Since wealth and good health to mankind
drain tile gave,
When the tile-maker dies flowers should
bloom on his grave.

No effort of man beneath the bright sun
In this beautiful world, has been half so
well done;
Great cities man built are now things of the
past,
But the tile we have made through all ages
will last.

When the tile-maker dreams of the good he
has done,
He is proud in his heart of the race he has
won;
Could he know he would die owing no man
a debt,



F. LEHMAN, Chicago.

'Twould crase from his heart the last bitter
regret.

Though he ownea nothing more than a
burial lot,
'Twould be sweet to rest there; his faults
all forgot;
If no marble slab marks the place where he
lies;
His grave which he tiled, will keep green
when he dies.

—Committee on Resolutions.—

President Purington: I will announce
the Committee on Resolutions: F.
Plumb, J. M. Mamer, E. M. Pike, W.
Hammerschmidt and Andy Harrington.

Upon motion of Mr. Pike, the Conven-
tion adjourned to meet Thursday after-
noon.

THIRD SESSION.

Thursday Afternoon, January 6.

President Purington: The Convention
will come to order and the Secretary will
announce the regular order of business.

Secretary Stoll: The first on the pro-
gramme is Mr. Bach's paper, which I
will read.

HOW CAN WE BEST DULL THE RAW EDGE OF COMPETITION?

By E. W. Bach, Ottawa, Ill.

Mr. President and Gentlemen of the Con-
vention: In selecting a subject for me, I
think our secretary could not have chosen a
more difficult one for me to deal with. In
the most favorable circumstances, the best
I can do is to recite and review facts which
are already self-evident to every one. If I
were able to solve conclusively what is the
best way of proceeding in competitive meth-
ods, or "dulling the raw edge of competi-
tion," I would, indeed, be a wise man.

The very first plan which is suggested to
any one thinking upon this subject would
be to form a "trust" or combination among
the manufacturers. We know, however, that
such a plan or suggestion would receive
about as much attention as if some one were
to formulate a "trust" or combination to
control the air. Even if it were possible to
bring the members of our craft together,
such an organization would be hindered on
account of the greatly varied amounts of
capital invested and the diverse methods em-
ployed, which would not allow of perfect sat-
isfaction being given every one.

Those who engage in the manufacture of
clay wares on a large scale, with immense
capital employed, are able to make wares
cheaply and rapidly and thus within certain
bounds set the price, and still make living
profits, while smaller ones would fail. But
such large concerns are few, and this
method does not answer the question as to
how we can fight competition among the
trade as it exists to-day.

There are some ways of doing this which
will bear rehearsal. First, ADVERTISE.
Let the people know that you are in busi-
ness. Not only should our most excellent
clay journals, which are the accepted organs
of our association, be used as advertising
mediums, but their pages should be perused
most thoughtfully for stray grains of very
valuable information, which I have often
found them to contain.

Make an article superior in quality to that
of your competitor, if such a thing is possi-
ble. We all have visited plants where the
utmost disorder and lack of care was evi-
dent. Order, care and attention to details
are a part of the stock in trade of every
brick and tile maker, and they cost him lit-
tle, but in too many instances they are total-
ly neglected. I, myself, have been in a large
factory where even the proper attention of
properly lubricating the stream of clay as it
came from the die was so neglected that the
edges of the brick were so cracked and curled
back that hundreds were worthless.

Another method is to keep in touch with
the most advanced ideas, not only in our
minds, but literally, by accepting and mak-
ing use of improved methods of manufact-
ure. If I use the latest and most practicable
crushers, screens, pug mills, or wet pans,
the most convenient means of drying, make
use of new discoveries in kilns, and the arts
of burning and glazing wares, you can be
sure that the competitor of mine who ad-
heres in all, or even in a small part, to the
old methods which were pursued some ten or
twenty years ago, will have a hard time of
it in competing with me. There are many
who love and still pursue if not wholly, yet
in part, some of their old methods and can
not be persuaded to accept new ideas. Dur-
ing the times gone by they were all right,
for the reason that there were fewer com-
petitors and prices were accordingly higher
and the loss caused by imperfect methods of
tempering clay and the slow processes of
crushing, making and drying the ware, to-
gether with the loss sustained in burning
in kilns of poor pattern was amply overbal-
anced by the higher prices and greater de-
mand as compared to the supply to be had,
and the manufacturer could well afford to
stand such leaks. An exhaustive subject
might be found along this line alone, but I
will drop this question here, with the re-
mark that in nearly every factory the owner
is trying to compete at a disadvantage
through still manufacturing by some of the
older and more expensive ideas and methods
of procedure.

Supposing you say that with all the mod-
ern improvements in buildings, dryers, ma-
chinery, kilns, etc., the manufacturer is still
meeting the most stubborn competition.
Then his resources should be along different
lines of ware. How do the people in the iron
industry continue declaring their dividends
of millions each year? The answer is evi-
dent in any hardware store of to-day as
compared with one of five or ten years ago.
The people engaged in the iron industry are
continually enlarging the scope of the prac-
ticability of their product and are at all

times creating something new or novel, which is at once practicable and profitable. Truly this is an Iron Age. Why don't the clay-workers make for us a "Clay Age?" The possibilities are just as great. You can not turn around without witnessing some production from clay, and yet how many of them are made at home?

I do not mean that the manufacturer of common brick and drain tile should expect to be able to make Doulton or Sevres ware, but I do say that in too many instances the manufacturer is expecting the little red building brick or the much-abused drain tile to do it all for him. Keep investigating the possibilities in your own clay bank. How many of you know but what, with proper manipulations, your clays might be suitable for vitrified wares, clay roofing materials, or terra cotta works, or even ornamental wares, and if fortunate to possess beds of refractory clays, then something in the way of coarser earthen wares, white or granite, or sanitary wares. Supposing you do have to import a part of the clay so used from another part of the country, is not the manufacture of better ware and an article which is of less frequent manufacture in your own territory going to greatly repay you for your trouble and small outlay?

To show you how the manufacturer often unnecessarily hurts himself in competition. I would like to state for example the case of street paving brick. The large manufacturers were at one time able to command and obtain a very good price for their pavers. The small manufacturers seeing the possibilities, and many of them with good reason, made a few samples of pavers which turned out well. These smaller manufacturers, in order to come under the large concerns, accepted very large contracts at a lower figure. The result was that when the smaller manufacturer came to make the pavers he found he was overtaxed as regards his capacity, in trying to fill such a large contract, and for that reason, wares had to be made hurriedly and without due care, and an inferior article made. I know this was the case in many instances, and this not only hurt prices of pavers, but it had the effect of hurting the reputation to some extent, in general. Those who exercised due care and judgment in accepting contracts only such as they could fill, and thus keep their pavers up to the standard and sample, are making pavers almost as fast as ever, and will always be in the successful manufacture of pavers.

A pernicious system which has caused much trouble in a competitive way has resulted from the present modes of contractors taking large jobs and thereafter having obtained the contract, going to the brick or tile maker and with the fact of his having the contract, use that as a leverage to get him to reduce prices. Too frequently the manufacturer is influenced by such an argument and puts his prices down.

Another system is the purchasing of architects and engineers. One manufacturer will offer to pay so much and another will step in and offer more in order to have his wares specified and used. While not directly so, yet this is a system of competition often resorted to. While it may sometimes be necessary to do this, yet it seems if any one's ware is not able to stand upon its own merits and the proficiency of its maker to dispose of it honestly, it does not seem possible that such a system can result in any lasting benefit to any manufacturer, for once begun with any individual, it will always have to be continued.

The matter of freight rates often amounts to a very large item to many of the brick and tile makers. Very frequently the roads seem to discriminate unjustly in the way of freight rates in spite of whatever they may try to do in order to be fair and just. We are all aware that at some time or other we have suffered through having seen a competitor's material, whose haul was three times as much as our own, go past our works to a point much nearer to ourselves than to our competitor. We probably never find out the reason why the railroads commit such apparent vagaries in the manipulation of their freight rates (perhaps they do not know themselves), but at all events they try to do the very best they can, and often times it is through the shipper's own fault through not having paid enough attention to this important item that he is loser thereby.

One thing we must bear strictly in mind. Our growing condition as a nation. We are approaching the condition of the old countries with enormous strides, outdoing them in some instances. Things are not as they were some time ago when there was a brick yard here and one there, for as we know, the same section now has within its bounds a dozen or more brick or tile factories where there was but one heretofore, and with each new plant erected we see introduced newer and more valuable machinery, capable of doing almost perfectly the work of many hands, thus creating an increased output at

a lesser cost. This is an age of cheapness, and in order to make people buy, we must sell cheap. In order to sell cheap we must make as good an article as cheaply as we can, and we cannot do this without accepting the best suggestions for our betterment in the trade from the best authorities. True, in a measure, we must often be our own authority and judge of our surrounding territory, the condition and requirements of trade, and our possibilities of expansion, and having once gained hold upon a certain territory which will be sufficient to keep our factory going, try at least to maintain your hold upon such customers. A prestige once obtained properly managed can always be maintained.

The American people are an ever changing people—are not like the Chinese or other Oriental nations which are content to use and accept the same ideas and articles for centuries, but nearly every year the American must have something different, something new, novel and practicable. This should be kept in mind by the clayworker, and if to-day any clayworker is able to say that he is satisfying in full the demands of the American people in his line of wares, then he may well and truly complain of undue competition.

President Purington: If there is no discussion on the paper we will take up the next,

THE ADVANTAGES OF TILE DRAINAGE.

By E. M. Pike, Chenoa, Ill.

Mr. President and Gentlemen of the Convention: When asked to take place on our program and was assigned the subject of



E. M. PIKE, Chenoa.

"The Advantages of Tile Drainage," my first thought was that the advantages were to patent to all to need an advocate and that it had become an actual necessity for successful farming and road making, and at this day and age no one opposed it. But a second thought, prompted by my recent experience in draining out a farm in a neighboring State suggested the idea that a little missionary work might yet be needed along this line. When we are asked, as we were twenty-five years ago, how does the water get in to the tile down through the ground, does the water go through the tile or in at the joints, how can we tell which way the water will run when the tile are covered over, does it pay, and how do we know that it pays, and interrogatories of like nature.

At this day and age of tiling there should be no "doubting Thomases," and he that actually knows no better should be wrapped carefully with the mantle of charity. He that can learn and will not, with the opportunities about him, has no excuse. But he that has opportunities without the ability to grasp them merits sympathy, and to these we would extend the helping hand.

We must admit that tile drainage has brought out blooming gardens and productive fields from swamps and miasmatic bogs to that great extent that our great western level country is practically becoming an immense garden. The reason why tile

drainage has done all this can not be set forth in a short paper like this.

Land drainage in this country began with John Johnson at Geneva, N. Y., as far back as 1834. He came from Scotland, a young man, and settled on a farm for which he was greatly in debt.

The idea occurred to him that underdrainage similar to that of his native country would aid him. He first used wooden drains, afterward secured a few tile from his own country. After this he made tile, forming them over a wooden mould, horse-shoe shaped, and burned them in a potter's kiln. Later on he made a wooden machine and ground them out not unlike our old-fashioned sausage grinder. We might add by way of parenthesis that Mr. Johnson, owning the only tile machine in this country, had no fear of any other machine man coming along and claiming that he had a better one.

The mission of tile is to take away the water, which warms the soil by settling the rainfall, which is warmed on the surface of the ground, which warmth is communicated to the earth as it passes down to the tile. Heat and moisture are two necessary elements to vegetation. Experience has shown that drained soil is, on an average, some ten degrees warmer at a depth of seven inches than undrained soil at the same depth. Heat and moisture are necessary to the germination or sprouting of seed and the growth of plants, while in the absence of these elements the seed would lie dormant in the ground and finally decay.

The soil being made warmer the season for planting becomes earlier and consequently lengthens the season. It makes more spring and more autumn, while the soil being at all times in proper condition, vegetation thrives continuously.

Franklin said, "burn a candle at both ends, and it is soon gone." The month of May ushered in amid snow and ice, and the season closed by the early frosts of autumn, is not well for successful farming. Tiling lengthens the season at both ends and forces growth the summer through.

The fertility of the soil is conserved on drained land, for the water instead of rushing over the surface to a lower level, carrying the enriching matter, descends slowly through the open interstices of the earth, carrying the fertilizing ingredients with it to the plant roots. Observation has shown us that the soil needing the most drainage is the most compact, being made so by water. Plant food in solution will be largely retained in the soil while the water will slowly filter through it and run clear from the outlet of the tile.

Drainage lowers the water level, encouraging the roots of the plant to penetrate below the effects of summer drouth, securing the free admission of air, which is also essential to plant growth.

Tiling does not cause floods, but on the contrary, prevents them in great measure, as we have tried to show; it reduces the water level. The action of the water seeking the tile below leaves the earth full of innumerable pores and the earth is not unlike a great sponge, which absorbs the rainfall and holds it in abeyance till it can find its way slowly down to the tile, enriching the rootlets of plant life with the salts of the air, which rainfall penetrates the earth.

The forests of the country, with their heavy undergrowth, before they were cut away, retarded floods. The crust of the earth is frozen many times when we have our greatest floods, so that the water passes off on the surface rather than percolates through the earth slowly to the tile.

We have recently come in contact with a few wiseacres who still insist that we tile makers are ruining this country by drawing away the water so that we will have no evaporation, and cite the dry seasons of the past.

It must be remembered that the greatest drouth of this country was in 1854, and we had but few tile then. In the years of drouth we have experienced the State of Michigan has suffered as much from drouth as any in the Union, and it is almost surrounded by three of the great lakes, with many rivers and inlets intersecting its interior. The facts are that excessive rainfall has caused more damage than drouth, and tile drainage moderates them both.

Capillary attraction, the action by which a sponge absorbs water, or oil is carried up a lamp wick, which is opposite to the laws of gravity, we have in the process of the growing plant. If a sponge is compressed little water is absorbed, but if let out it's full size much more will be taken up, because the pores are expanded. Thus it is with drained soil.

This does not apply to that kind of soil so loose as not to be effected by capillary attraction. These openings will fill with air and destroy the combination of elements, which changes the conditions, which com-

bine and cause stagnant water.

Tile drainage is teaching us that we have a farm under the one deeded to us, and the best one of the two, and it is this capillary attraction which is greater in this respect than gravity, which is bringing to the surface through these pores the moisture in the soil below, which can not be separated, except by evaporation and absorption in plant growth.

We have observed that on tiled land the surface dries out very rapidly after rainfall, but the top of the soil dried is very shallow. This dried part acts as a mulch, or cover for the surface, preventing to rapid evaporation, and causing the little rootlets to penetrate the arable soil, seeking nourishment and strength necessary to plant life. This same condition of soil prevents early freezing in autumn, or the thawing and freezing in early spring, so injurious to wheat in former years, and were it not for our tile it would be just as impossible to raise wheat now as then.

We need to get water into the soil and retain its needed moisture, as well as to get it out, and the process of getting it out makes it possible for it to get in, and vice versa.

Quoting the oft repeated saying, "that he who makes two blades of grass grow where only one grew before is a public benefactor," how much more credit is due you present here to-day whose thought and ingenuity has made it possible for vast fields of grain to wave even where the one spear of grass was almost invisible.

Plant life demands air, as well as heat and moisture. We plow corn, even when there are no weeds to kill or the corn needs hilling, we plow it, we stir the ground, for experience has told us it demands it to make a crop. The stirring of the soil opens up new and many openings, as it were the lungs of the soil. The leeching of the water downward opens the soil, admits warmth, increases its depth below the young roots of the plant and the consequent thrift. Cold, wet feet for plant life is as fatal as for human life. Applying the same principle, if fertilizers are applied to land it is not washed off on the surface for the porosity of the earth retains it, as already shown.

We have a cloud of witnesses from every walk of life, testifying that we have given the people bread in times of flood, and kept them from famine in times of drouth, even when there were no corn in Egypt. We have reduced the shakes to a minimum, and the price of quinine as well, with this great system of tile drainage.

From whatever source we get water, whether from snow, or ice, or the summer shower, it percolates down through the soil to the tile, making innumerable pores or holes, which materially aid in deepening the soil, that the roots of vegetation may reach deeper, thereby gaining more strength and nourishment.

Tile drainage is beneficial in dry weather for the reason the pores in the ground, made by action of the water, become breathing holes centering on the tile, in numberless angles. These pores connecting the tile with the surface of the ground act as little chimneys or breathing holes, which create a draft through the tile, which brings the night air laden with moisture, which comes in contact with the soil, which is cooler than the air, which causes the dampness to be taken up by the soil and communicated to the roots of vegetation.

Tile drainage has made this country more favorable for human existence. Extensive marsh lands, bogs and miasmatic swamps are giving place to dry, arable and productive fields.

While this is true the sanitary condition of our country is improved year by year, the results of breathing pure air in lieu of poisonous vapors.

We have tried to show that tile drainage lengthens the season at both ends. While this is true crops grow faster and mature quicker, with better grain and more of it, because the climatic conditions have been so moderated and conditioned by the combined benefits of tile drainage.

Mr. Billingsley: I would like to call attention to one point. First, I would like to say, this is an admirable paper. In the next place I want to call attention to one fact that he referred to, and that is this, people claim that we are draining off water that we really need for crop growth. That charge has been frequently made and will be in the years to come. Now we can call to mind the time in our recollection—that is, we older men, friend Pike and myself and a few others—when almost the whole surface of the country in the State where I live

was covered over with grass and weeds and vegetation of one kind and another, so that the water would fall upon the ground and lay there for a long time. We can remember the time when streams would rise and it would take weeks and weeks before they went down. Now it is only a few hours until they are in their normal condition. These waters do not run down through the tiles. If you will notice, the very pathways to the schoolhouse and the pasture make little streams for the water to pass off, and our highways are constructed with open drains to carry off the water rapidly. The drifts that once lined our streams from end to end almost have all been cleaned out, so that the water has a free flow—everything accelerates its motion toward the great common receiver, the Gulf of Mexico. There is nothing to hinder the water from rushing right off over the surface, and this rushing process is carrying away the fertility of the soil—it is carrying away the vegetable matter on the surface year after year until not much of our farms are left. We turn over six inches of our soil and work it and it is



A. R. BATLEY, Bucyrus.

washed off, and the next year we turn it over again and wash the other side. Now, if we had our lands thoroughly tile drained, so that when the water falls upon it the soil would act like a sponge, drinking up the water and with it all the little particles of plant food, and would hold them there, because by tile draining we get the water to pass down through the soil. Otherwise the water would pass off over the surface and carry with it all the finer particles of our soil, and that is not all—we are losing a great deal more than that. This capillary attraction referred to by Brother Pike, when the water is not going down through the soil it is going the other way. The water in its upward flow is bringing up fertilizing elements that it will leave at the surface, and when the water is carried off the loss can not be computed and we are suffering that loss year after year, simply because we have not underdrained and put our soil in a condition that will preserve it. This I regard as one of the most important points in the favor of underdrainage, the saving of the fertility of the soil and the saving of the moisture of the soil. [Applause.]

President Purington: We will pass to the next number on the programme.

Secretary Stoll: The next is a paper, "Hollow Blocks; Their Advantages," by William Griffen, Griffen, Ill.

HOLLOW BLOCKS—THEIR ADVANTAGES.

By Wm. Griffen.

Mr. President and Gentlemen of the Convention: In taking up the subject of hollow blocks I will endeavor to show a few of the advantages they have over other building materials. Evolution in clay goods we find as remarkable as in iron and steel. It is only a short time since the use of steel for building, which is much more preferable than iron, was so costly that its use was limited to only a few, but now, being made under new processes, it can be bought as cheaply as iron and, considering the difference in weight needed compared with iron, it is even cheaper.

Just so a short time ago in using clay for building—and we all know that vitrified clay will outlast any other material for building—it was necessary to have it made into bricks, which in buildings from four to twenty stories high means expensive foundations, on account of the immense weight they have to bear.

All of this is rapidly changing. We are now, as are many others, making a hollow block $8\frac{1}{4}$ by $8\frac{1}{4}$ by $16\frac{1}{2}$ inches, which weighs thirty-five pounds and sustains a crushing weight of 150,000 to 280,000 pounds. In using hollow blocks the foundation is relieved of about two-thirds the weight it would have to bear if brick or stone were used, which in high buildings amounts to thousands of dollars in the cost. Again, we find they overcome a great difficulty found in solid brick or stone buildings; that is non-insulation. In using hollow material we all know we have a nearly perfect insulation, keeping out all dampness and frost and being warmer in winter and cooler in summer. There is also a great saving of mortar, freight and time of laying up. One architect in Chicago who makes a specialty of large buildings, said the hollow blocks had saved in one estimate on the foundation alone thousands of dollars.

Of course a great deal of care has to be used in making hollow blocks as, on account of their size, one that is the least bit out of true cannot be used in a wall above grade. They must also be burned uniformly in size and color. If one block is longer than the next you do not get a perfect joint, and if one is dark and the next some other color we do not have a good effect. All blocks should be thoroughly vitrified, as a hollow block that absorbs water is a dangerous thing to put in a building, for on account of the thinness of their walls, they disintegrate much quicker than even a soft brick. A prominent Chicago architect told me that this had been the great drawback to the introduction of hollow blocks. He said so many were made out of a fire clay which when the salt gaze was knocked off were so porous that he—as were others—was afraid to make estimates on them. Upon our showing him our vitrified blocks he became quite interested and we expect to have them used quite extensively.

A variety of clays are required to make a good block, as it must be tenacious in order to keep its shape while in the green state, and must be vitrified and of an even color when burned.

We make four distinct colors—a dark glazed and a light glazed, which is a straw color, a red and a white, the two latter being unglazed and resembling sandstone in appearance.

All plain and ornamental blocks are made by machinery, the Durant system of roller dies being used for making the ornamental. I am fully aware of the fact that it will cost the clayworkers some time and a great deal of work to get hollow blocks universally introduced, and to overcome and combat all objections, but I am confident that the victory will be ours just as it was along the paving brick lines, which, as we know, met with many objections, all of which were successfully overcome.

Secretary Stoll: The next on the list proper is a paper, "The Value of Conventions," by J. H. Lambert, St. Mary's, Ill. As Mr. Lambert is not prepared to read his paper just now, I will ask Mr. Randall to read Mr. Cowgill's paper. Mr.

Cowgill could not be with us, but he sent his paper.

Mr. Randall then read the paper,

THE ADVANTAGE OF LARGE TILE DRAINS.

S. C. Cowgill, Summittville, Ind.

To speak of the benefits of large tile drains is like speaking of the benefits of a large corn or oats crop; the benefits are so apparent that it seems idle to speak of it.

To get the relation as I have spoken of between tile drainage and a large corn or oats crop, let me ask what, in the memory of young men of thirty, has made it possible for what was once vast prairie marshes, to become at this date the leading corn and oats producing district in the world. It is to the railroads, which cross and recross our country and do so vast an amount of business and which play so important a part in marketing our products? Evidently it is not; because the railroads do not add to the producing capacity of the soil and evidently without the conditions to increase its capacity, we would be where we were thirty years ago.

Was it the improved machinery supplied to the farmers that has made it possible to raise the abundance we are now raising on heretofore waste land? Evidently not, because they only add to the working capacity of those who raise our products and not directly to the producing capacity of the soil. There has been no change in the elements to absorb the acres of water that formerly smothered vegetation and prevented the use of machinery. Then the railroads stopped their trains only at water tanks and the freight they hauled was from other more favored districts. The passengers that arrived at the small stations were of a class that had determined to try here before going farther west.

Your railroads, your improved machinery, your elevators and even your flourishing towns filled with merchants and business men selling all classes of goods under the sun, owe their existence to the fact that through the courage and determination of the first settlers, the country was redeemed from marshes and miasma by the use of drain tile.

If I ask what has made it possible or what it is that has taken these immense marshes from us and effectually keeps them away and enables these marshes to become the most valuable farm land, there is not a man acquainted with the conditions now, and then, that will not instantly say, it was the use of drain tile.

If you want to impress the extent of the benefits of drain tile to the farm interests of the State of Illinois on your mind, just call up the time when you could have purchased some certain piece of almost any farm land in the Illinois prairies for from \$3 to \$10 per acre and have drained it from \$3 to \$10 an acre additional and could have experienced more profits thereby than you have been able to acquire in all the time since this opportunity has passed—even though you may be a manufacturer of drain tile. What else is, was or can there be that would have produced the same effect and added so largely to the wealth of the State of Illinois as drain tile.

You all know the past history of the use of tile in this State and its benefits, and now we have it said that our land is all drained. It has all been tiled out, and by those who apparently know most about the condition of things—the oldest inhabitants—those even who have been the most lavish in the use of tile heretofore.

Let me ask some of these men's sons who have come along after them and correct their mistakes. While these men have forged ahead in their time and have deserved the praise of all for their energy and endurance, they are still thinking on the line they thought on thirty years ago. Their idea is filled completely—having accomplished all and more than they anticipated—and the tendency is to rest now in the thick of the battle as soon as victory appears in sight.

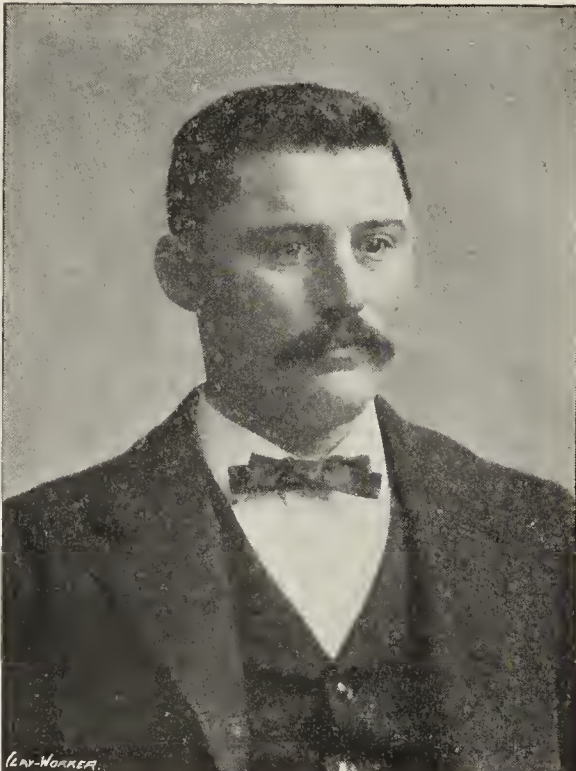
These pioneers have left their mark perhaps more visible than any generation that will follow, but one mark in particular is painful to this generation and that is the mark they left with the sixteen horse plow or the twenty yoke of oxen as they vainly endeavored to start a channel through the wild prairie marshes when they first began on their drainage outlets.

These marks or furrows have been deepened and widened from year to year, have been extended farther and farther towards the permanent outlet until now we have

the spectacle of great crooked channels full of weeds and grown up with willows, in a great many cases marring otherwise beautiful farms, a constant expense, a constant annoyance and a waste of land. Into these ditches the tile which has cost so much money that the tile makers all wear plug hats and kid gloves and which has cost so many years of toil and so much anxiety and worry "as to whether they would work or not," into these crooked evolved image of an ox furrow all those tile which have cost so much labor and money and on which so much depends, find their way an end.

If this generation performs its works as well as our fathers, it will continue what our fathers begun, round off and make perfect the greatest improvement that has ever been made in Illinois. On these large open ditches is the sole dependence of all the smaller tile that have been laid in this country. It takes but a short time for the loose prairie soil to fill up in the bottom of those old open ditches until the bottom is above the grade line of the small tile to which it is intended to give an outlet and thereby holding the water back in the smaller tile ditches, in some cases totally destroying them as the sediment will settle in dead water, and it takes but a short time to allow the system, which otherwise would be all that could be asked of it, a perfect failure. I think 70 per cent. of the average open ditches throughout the country can be run through drain tile at a cost not to exceed an average of \$2.80 per acre on the land benefited.

In Indiana there is a law that provides that all county ditches shall be cleaned out once a year, between the 1st day of August



LOUIS H. LAMBERT, St. Marys, Ill.

and the 1st day of November, and provides for a fine on the township trustee whose duty it is to see that this is done, if they are not cleaned out according to law. By careful inquiry I find that the cost runs from 20 cents per rod to 75 cents per rod and averages 35 cents per rod yearly.

I find that the average cost to tile these same ditches would not exceed \$2.80 per rod complete so as to farm over—computing the sizes of tile with equal sizes from 10 in. to 20 in. tile. This would make the cost of keeping an open ditch in repair 12½ per cent. of the cost of running it through large drain tile, to say nothing of the benefits to the small drains, the redeeming of land wasted by an open ditch, etc.

The capacity of the large sized tile that can now be had is enough to successfully drain 1,000 to 2,000 acres of land and we are not done tiling till these large open ditches, which are such a nuisance to the farm and that are almost as bad as a mortgage, have been converted into tile drains. If it has benefited us to put in what tile we already have in isn't the benefit equally as great and as absolutely necessary to keep these ditches in repair? It is true we have but very little swamp land and but few farms that do not have enough tile in them to keep it dry enough of a moderately dry year, and if wet weather does not continue during the planting season, but it is this same wet weather, the continued rains that sog the soil because of the incomplete system of drains already in, that cause the average yield as reported by our crop bulletin to fall

short of what it is possible for it to be. Why should the crop bulletin of Illinois show a yield of one-third more in one year than it does in another at any time? If all seasons were alike it would not do so. It is during the driest seasons that our reports show the greatest yield. Why? Because the most of the producing area is tiled sufficiently to carry off the light rains of a dry season and thereby the soil is so effectually drained in the spring months when vegetation is springing into life and during the time it makes the most rapid progress that by the time the drouth has done any damage the tender roots which furnish life to the plant has grown so as to effectually shade its vital points against the scorching rays that come later on. I do not think we have any history of a drouth in April or May in this country that was so severe that vegetation would not grow and even flourish. It is later on that the dry weather begins to be its work and if there are heavy rains about planting time and soil is insufficiently later on that the dry weather begins to be drained the hot sun of June and July scorch the slender roots of vegetation that have been choked with water at times when it should have been making healthy growth, and our empty corn cribs and oat bins tell the story. Can any one say that if we had the proper drainage that we would not have a more uniform yield.

True there has been a great falling off in the demand for tile in the last three years, and to look at the number of factories that have had to suspend it seems that sentiment belies the statements. I wish to say that our oldest counties have shown a marked interest this fall in tiling their large ditches and Illinois is not the State to let this work stop now and allow what she has so nobly begun to go to waste.

I would like very much to leave my subject a moment and call attention to the best and cheapest manner to get our large tiling done, but it would tend to overthrow the aboriginal drainage laws of our State and that might be treason, and I do not want to lay myself liable, yet it is significant that Ohio, whose lands, if we had the same here (we who say we are done tiling) would say they need no tiling at all, use more tile than we do and are twenty years ahead of us on the tiling question.

The Ohio ditch laws give the farmer from one to ten years and some times twenty years to pay for their tiling, at a minimum rate of interest of from 3 to 5 per cent. By paying the cash for the improvement the State secures the very best talent in the way of contractor for the work and secures to the farmer the benefits of a cash deal; pays the tile man for his tile in cash as soon as delivered and gets the cash discounts and sells the work in such a way that contractors material men can afford to bid much lower, etc. If I were to speak of the best way to lay our large tile, I would say adopt the Ohio ditch laws, and I believe a study of these laws or to witness them in operation will convince any one of you of this. Can we depend upon the tile interest to keep pace with our other interests? I think we can. Already I see a rousing interest in large tile drains for tiling our large open ditches and think the next few years will bring about a new era in tiling that will be as great a benefit as that already done.

President Purington: If there is no discussion of this paper we will pass to the next, and hear Mr. Lambert.

THE VALUE AND ADVANTAGES OF CONVENTIONS.

By Louis H. Lambert.

Mr. President and Gentlemen of the Convention: It occurs to me that our worthy secretary has made a poor choice in selecting me to write on this subject, as there are a good many in this association who could handle it a great deal better than I can, although I have derived a great benefit from Conventions.

The first meeting I had the pleasure of attending was the National Brick Manufacturers' Convention, at Louisville, Ky. I was then an infant in the clay business, knew nothing but trials and tribulations. We made bricks and sold them, but that was not the last of it; the man that bought them would come back the very next spring and then I would catch it. Those bricks had shelled or crumbled by freezing in the winter. What the trouble was we did not know. The bricks were hard and had a nice color, but they would not stand freezing. It was then that I made my mind to attend a convention. I got an invitation to go to Louisville, and I went.

There I met men who told me that my clay

would laminate, and gave me a prescription that was worth to me a living, and we have never been troubled with lamination in brick since. Then I made my mind to attend the State convention the following year at Springfield, and since then I have attended the State conventions every year and if I was troubled with anything I would always find some one who had experienced the same and told me how to overcome it. As the members of the Illinois Clayworkers' Association are not at all selfish, if they know of a good point they very willingly give their fellow craftsman the benefit of it.

So with the papers written by some of the oldest and ablest clayworkers in the State. Those alone are well worth the time and money spent to attend the convention. One can learn more from them and the discussion of the same than he can making brick and tile a whole year, unless it is someone that knows it all and don't care about anyone else's knowledge. He I would advise to stay at home. Let him keep on making brick or tile the way his grandfather did and if he can sell it at the same price sold then he is all right. But if he must meet competition of to-day "he is not in it," because we all know that to-day we have to produce a better and finer ware and sell it for less money than our forefathers did, and in order to do that we have to use modern machinery.

At the convention we can always find a machine or kiln agent ready to show the good points about his machine or kiln and we need not go without that knowledge unless we want to. Another thing that is of a great benefit is the knowledge we gain by visiting the different clay industries in the city where we have the pleasure of holding the conventions.

As our executive committee is always very careful in selecting a city for holding our conventions where members will derive the most benefit by visiting the different clay enterprises, which are always very interesting as well as instructive to the members, from it we all derive more or less knowledge that we could not get if we did not attend these conventions.

Again, the friendship which springs up between the members at a convention is something which I am sure we all highly esteem. Now I will close with my humble effort to explain the advantages of having and attending conventions.

I believe you who are here to-day listening to my short address will not take advantage of my errors and omissions.

Wishing good luck and success to this convention, I am yours truly,

Secretary Stoll: In the paper just read Mr. Lambert, in speaking of the benefits of conventions, says that at one of them he learned something he had not known before, and that was how to stop the lamination of his brick. And there may be some here in the convention to-day who are experiencing the same trouble, and it might be well for Mr. Lambert to tell us what he did.

Mr. Lambert: The way we overcame that trouble was, in the first place, we mixed our clay more thoroughly. In the second place, we made side-cut brick instead of end-cut, and another thing we did was to use a lubricating die.

President Purington: His Honor the Mayor tells me there will be an exhibition of the fire department on the Square at 5 o'clock and he is very anxious to have the members of the Convention witness same.

Secretary Stoll: The next paper on the programme is

—"The Tribulations of a Brickmaker,"—

By A. L. Converse, Springfield.

Mr. Converse: Senator Palmer and myself are very intimate friends, greatly to the credit of the Senator [laughter], and he once said in my hearing that one of the worst things that a man could do was to hold a sore finger under the nose of anyone, and inasmuch as you friends here are all brickmakers, I feel satisfied that you will not take it that anything of that sort is being done to-day, because you all have your troubles, and lots of them. I regret that this paper comes at a time when we are closing, when we ought to go off in good nature. It would have done better yesterday, but when I begin to state the real troubles I am

afraid some of you will go away with saddened faces.

TRIBULATIONS OF A BRICKMAKER.

By A. L. Converse, President Springfield Paving Brick Company.

Mr. President and Gentlemen of the Convention: The subject, "Tribulations of a Brick Maker," which has been assigned me is one upon which I am poorly qualified to write.

The subject itself being somewhat pessimistic in its nature, should never have been assigned to a man who is opposite in his make-up.

Tribulation has a doleful sound, and is a tune that should be played on an instrument of but one string.

The first knowledge that I had that I was to write upon this subject came to me through the medium of the journals of the craft, and always looking upon the information received from that source as being strictly reliable, I had not the heart to do anything that would bring the journals into disrepute. I therefore am before you in conformity with the published program. Had it been announced that I was to read an essay upon the Mound Builders of Mexico, or upon the state religion on the Klondike, this convention would have had to listen to a dissertation upon one of those subjects.



A. L. CONVERSE, Springfield.

I have unbounded confidence in all of the Clayworking journals. We take them all at our house, and we all read them, including the help. Last Easter my wife came out in what the ladies would call "a regular duck" of a bonnet. I think it is one of the most becoming bonnets I have ever seen her wear. I was not pleased with the thought of the prospective bill, but when I hinted at that she said she made it herself, and that she had patterned it after some of the ceramic designs in pottery she had discovered in the Clay-Worker. You can imagine my sigh of relief. When I remarked that there was real profit in that journal, she said, "Why, don't you know what May has done? The sink spout and kitchen sewer got stopped up, and just as I was going to send for the plumber, I found that everything was lovely. When I asked her where she got her idea, she said she had been reading one of Mr. Billingsley's articles on farm drainage in the Drainage Journal." My boy patented a new-fangled churn, and just as I was about to apply for a patent for him, he said: "Don't do it, pa; I copied it from a pug mill that I saw in Brick. On Christmas eve we had for dinner the finest lobster salad that it has ever been my fortune to enjoy, and upon inquiry, I found that the cook used a recipe found in the Clay Record for the manufacture of slip for dry pressed brick. [Laughter and applause.] So you can see why the clay journals are indispensable in our household.

I am not aware that the manufacturing of brick is accompanied with more trials than other occupations, although it would seem from the fact of this subject having been assigned me, and properly placed upon the program, that there was a vague sort of impression that special tribulations came to him that engaged in this enterprise.

I but recently entered a barber shop for the purpose of being shaved. (I would not have you think that the barber shop is the only place where I undergo the shaving process.) In this shop there immediately commenced an animated conversation upon the importance of the organization of a barber's union. I soon learned that the immediate cause of this suggestion was the fact that a couple of good-looking young women had started a shop on the opposite side of the street, and that they were practicing the tonsorial art at greatly reduced prices.

As soon as I succeeded in getting the lather out of my mouth I was constrained to make the remark, "Poor barbers; you are worse off than I; as yet I have not had to come into competition with women in making brick."

When an invalid in his wanderings in Florida in search of health came across one of the natives resting upon an inverted stump, and asked if there was any malaria or consumption in this country, he received this answer: "Young man, I reckon you are hunting after a healthy place to live; if so, I want to assure you that after skirmishing around for over 80 years, I have come to the conclusion that it's dangerous to live anywhere." I throw in this thought for the purpose of advising any of my hearers, that if he ever expects to engage in any occupation that will be free from trials and tribulations he had better secure tickets for the next world; and in making selection of the particular place for location, to get as far removed as possible from either the up or down draft kilns.

The greatest difficulties that I have experienced in conducting a brick manufactory has arisen from an over confidence in the makeup of my disposition. Unfortunately I am too much in the habit of implicitly relying upon the statements of the innumerable road agents that visit our works. When one of these winning and attractive fellows tells me that he has the only machine that is capable of making merchantable brick out of my material, of course I am exceedingly anxious to believe him; and when he further tells me that the back action of his pug mill so thoroughly combines the shale and water that the result will equal a five years' weathering, of course I am prone to give my assent to his proposition, and begin to look upon him as being angelic in the extreme. If to this is coupled the statement that the improved die in his repress will make a square or round cornered brick without changing the lining, and that the mechanical arrangement of said repress is such that it gives three times the pressure of any other machine, and has never been known to break, it is easy to understand that I should naturally want one. And if in this connection I am made to understand, that if I only had one of John Blank's friction clutches I would have no difficulty in either starting or stopping all of the aforesaid machinery simply by winking my left eye, is there any wonder that a cool fifty immediately slips our fingers in its purchase?

After all of these promises and guarantees prove to be but a delusion and a snare, and I find that our brick have to be smoothed with a shingle before I can palm them off on a near-sighted contractor, is there any wonder that I find fault with my wife's cooking at dinner time; or that I blow up my shoemaker the next time I meet him for his ill-fitting shoes which have produced corns on my heels?

I am glad to assure you that none of these troubles come from the use of our patent kilns. I have found from experience that our kilns surpass the guarantee placed upon them. I remember asking in my innocence how long they were supposed to last. I was informed that they had been in use over twelve years, and all that had been made thus far were in as good condition, if not better, than when first constructed. We have had ours about five years, and I believe they show a decided improvement every time we overhaul them. We have never had to take one down, on the contrary, we are always building them up.

At the rate we are going I think our kilns will last a thousand years; they require but few repairs, and those at a trifling expense. With occasionally a new floor, furnaces once in a while, now and then an arch which has been first supplanted with a side wall, coupled with a few new chimneys, never more than ten at a time, is as much as we have ever had to do in any one year. Stay rods and buck staves we don't count, because we always keep a blacksmith and he repairs those at odd times. Some brick makers use

kilns of their own designing; you can always tell one of these fellows by his sallow complexion and his far gone look. They always walk with a lateral curvature of the spine motion, with a slight impediment in the left leg, and carry their right hand in their pocket to disguise the loss of two fingers and a thumb. Most of them are cross-eyed, and when talking about the merits of their kilns (which is all of the time when they are awake), their mouths work like a camel's chewing his cud. Their hair has a singed aspect. All of these home-kiln makers that I have known have been grass widowers, their wives having run off alone, never wanting to be caught with another living man. I am happy to state that I have never invented a kiln. While we are willing to admit that brick cannot be burned without kilns, yet making them with kilns is the killingest part of the whole job.

As to dryers, I have been informed by a number of half-baked brickmakers that dryers are like the forks of a road, whichever you choose you will be mad at yourself for not having made a different choice.

But this has not been my experience; our dryer works beautifully. We had reason for believing it to be the best on the market, and we have never changed our mind; it never gives us a particle of trouble as long as the cars stay on the track, and the wind blows the right direction, and the pipes don't leak. Our dryer was invented by a Dutchman (a very small man). I expect he commenced inventing it before he got his growth, and never grew any more after the first inspiration.

Our first impression was that we had built it wrong end foremost (like the Dutch language). But after getting an expert to examine it for us we found it was all right with the exception of the stack, which we have since altered, and the doors which we have taken out, and the floor which we have remodeled. We have lately overhauled the roof, and believe we have got the best dryer in the country.

We have an excellent old colored gentleman that has our dryer in charge, by the name of Green. I have sometimes thought if he wasn't Green he wouldn't want the job.

Our dry pans, I think, without doubt are the best the market affords. The mullions are fastened together with yokes not unlike the yokes found upon southern oxen, and are not unlike the aforesaid oxen in occasionally turning their yokes. These dry pans afford the boys a vast amount of fun when it comes time to repair them; in fact, I think I can safely say that it comes nearer a picnic than anything they have to do on the works. It takes about a dozen of them to hoist one of these mullions from its field of operation. It is then that the plug of tobacco is sent on its round to do its mission as an equalizer, American, Irishman German and negro each taking a chew in proportion to the size of their respective mouths. If any of it is left after having contributed to the happiness of each in his turn, it is generally returned to the pocket of the boss. I have never found out what the boss does with what is left, but I have always suspected that he carefully lays it away for the next traveling agent. For real fun without tribulation, give me a nine-foot twin dry pan to overhaul. I understand that after pulling and lifting of these ponderous machines all day, the young men put in the whole of the following night in the mazy dance, while the old fellows walk immediately home and remind their wives that on account of the recreation which they have had they are willing to put in the night taking care of the baby.

I have thus spoken of the pleasant side of brickmaking. I have been somewhat particular about it in order that I might entrap a few more men to engage in the enterprise. What we need is more competition—competition, you know, is the life of trade. I want to help as much as possible these oily tongued road agents in their mission of starting more plants. If I can only supplement their fairy tales of how building brick can be made for \$2 a thousand, and No. 1 pavers at \$4 a thousand (all at a profit), and can help them to make stockholders believe it, and thereby induce them to accept our surplus in the form of dividends, I shall be happy.

These statements will further help municipalities to understand the enormous profit that we are making, and give contractors an opportunity to whoop and holler about the manner in which they are being swindled by unlawful brick combines.

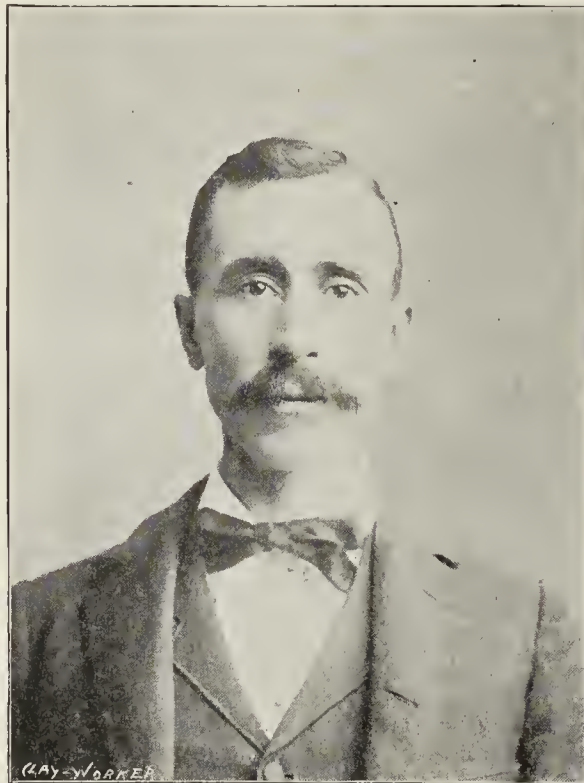
I have reached the conclusion that the easiest way for me to increase the dividends is to cut down my own salary.

The only real tribulation that I have experienced in conducting my business is in the loss of my horse; I got along with him nicely until for some reason unbeknown to me he took it into his head to try and imitate the end man of a minstrel troop in the play of bones, but bones became too much for him and he had to succumb.

I bargained with one of my best friends for the purchase of his horse, but after he found that I expected to pay for the same with my note he refused to deliver. I then addressed to him the following letter, which I shall here insert, that you may know the extent of my tribulation in that direction:

Mr. John H. Brock:

Dear Sir—I have not heard from you concerning the horse that I bargained for last Monday. Will you please call at my office at your earliest convenience, and let me know the conclusion you have finally reached. I believe your horse will answer my purpose nicely, if he is not too strong (in appetite). I would like a horse that could go his mile in two minutes, for the double purpose of avoiding my creditors and being able to catch up with the fellows that owe me. Do you think he could be taught to thrive on a diet of bran and sawdust? If so, how little bran do you think would suffice? If he has learned the trick of my last horse of keeping himself clean by rubbing on the corner of the barn, and if his hoofs are sufficiently hard to permit of his being used without shoes, I shall be glad. As my buggy is worn out, I shall expect to do considerable riding on horseback (if I can borrow a saddle), and as I am getting a little stout, do you think I could teach him to squat a little when I want to get on? If the requirements here made can be guaranteed, instead of offering my note, a number of which are in active circulation, I



DAVIS BROWN, Decatur, Chairman of Committee on Entertainment.

will give you three bran new Bryan dollars on delivery.

Respectfully yours, etc.

In a few days I received the follows answer:

My Dear Sir—Your esteemed favor of the 6th was so heavily loaded that it had to travel slow and did not reach me until yesterday. I am sorry to inform you that the horse you wanted has been sold. But it is the height of my ambition to please my customers. Fortunately I am on the track of another horse, a near relative (grandfather) of the one you wanted. I know he will suit you equally well. This horse will not go his mile in two minutes, but I will guarantee that in less than two minutes he will go as far as he wants to, and he will be sure to stop when he gets there. This horse was formerly owned by James M. Britt, the renowned turfman of Springfield, Ill., who used him in his own family for twenty-eight years. After he had been thus thoroughly tested and his good qualities found out, being hard up, he was forced to sell him, which he did for forty-five cents, payable in labor. The purchaser, owing to the extravagance of his wife, has never been able to pay for the horse, and he can now be had at a great bargain. I know he will suit you. While he will not squat to be mounted, he will squat to let you off. I do not know that he has ever been fed on sawdust, but he has been known to thrive on telegraph poles. Another peculiarity of this horse is, if he should become disabled in one leg, he can travel just as fast on three legs as he can on four. Hoping you will appreciate a good thing when you hear of it, etc.,

I am yours truly,
JOHN H. BROCK.

I have given you this letter verbatim et literatim, that you may know the high estimate placed on the requirements of a real brick man in our neck of the woods.

I think I shall buy his horse; if so I shall not have to spend all of the two and a half that I borrowed for the purchase of the other, and in that case I will have something left to apply on the seal skin sack that I rashly promised my wife when I started in the brick business. But after all I am having a good time. This is the best world I have ever lived in. I remember asking my mother once where I came from. She said I came down from heaven. But inasmuch as that was a long while ago, and I must have been quite young at the time, I don't remember it. I feel that the man that can't get more good than bad out of this world is both a fraud and a delusion. I at one time taught school and boarded around, and can assure you that for every meal that I ate of bacon and corn-dogger I got three with chicken and cranberry sauce.

And this has been my experience in making brick; there is no use in grumbling; I have made some money, and had some pleasure, and no more trials and tribulations than any other occupation in which I have been engaged. I am now beginning to realize the anticipated prosperity for which we have all been longing; for the first time since the starting of our plant are we behind in filling our orders, and the first time in our history that I have real tribulations on account of abuse from contractors for not keeping them going. (Applause.)

President Purington: This paper is open for discussion.

Mr. Eudaly: It is certainly well worthy of discussion. It has been suggested that discussion ought to be opened for a few minutes, in order to show our respect to the man who has gone through so much with such a degree of health and prosperity. I seem to be one of the parties interested, and while I agree with all that has been said in the paper, I feel that other gentlemen should make the principal remarks. I want to say it is one of the most amusing papers I have heard for a long time. I think it has opened up an avenue of discussion that will last the entire year. I do not expect to hear the last of it for a long time.

Mr. Pike: You make it worse, Eudaly, the longer you talk about it.

President Purington: I have been asked to call on Mr. Pike.

Mr. Pike: This is rather a dangerous thing for me to talk upon. I have been urging on other friends around me and hoping my friend here, who always helps me out of a scrape, would go on enlarging on it. I do not think I can add anything to what has been said.

—The Wear and Tear of Clayworking Machinery.—

Mr. Converse: May I say a word? I want to say this thing was announced in the journals that I was to write on Tribulations. I have no real tribulations. What has been written was written in a spirit of humor, and of course you all took it that way. I am frank to state that of all the enterprises in which I have ever been engaged, and I have been engaged in a great many, I know of no other that is so destructive upon the plant itself as that of the manufacture of brick. This is no criticism on those who are selling machinery or dry houses or kilns, but what I say is true of every man's machinery and every man's dry house and every man's kiln. You can not do that kind of work without a greater percentage of loss on the original investment than anything I know of, and for that reason I am bringing out this idea. We are furnishing our material for far too little money, only to keep up a constant deterioration on account of loss. This is a serious aspect to this business. We have all got to keep up repairs, got to keep our plant running or lose in the long run. I think the men

who are selling machinery have made altogether too glowing a picture of it. There is not as much money in the manufacture of brick as a great many people anticipate, and I was in hopes that some of the officers of the municipality here might hear that paper and get something of the idea of the expenses to which we are put to get our commodities before them. The truth of it is no matter at what price we sell our brick, in the estimation of the people, we are getting in the neighborhood of 100 per cent. profit. I have sold brick for a good deal less than they cost me. It is difficult to make municipalities and contractors believe that. So while there is a spirit of humor in that paper, there is some truth in it as well. There are some things that men ought to look at and consider fairly before they undertake an enterprise of this kind. I am sure my experience is the same as that of other gentlemen. I have no complaint to make. There has not been a year in which I have been engaged in the business that I have not made some money, and I have counted off each year a large per cent. of loss. Our plant, I believe, is better than it was when started. We have tried to keep it in repair, but don't any of you start a brick plant unless you expect to make extensive repairs.

Mr. Eudaly: I would like to make a few remarks. We all understand Mr. Converse's paper to be intended just as we took it. Nevertheless, following up his last remarks, there is a great deal of truth and honest suggestion in this paper. Take any line of manufacture, whether it be that of clay or most any other line in this country, you will find that when companies or firms break up and go to the wall it is because they have not, when making up their inventory from year to year, counted anything for the deterioration of the plant. They go on from year to year as though the plant were worth just the same as in the start. They go on the theory that nothing wears out about the plant in many lines of manufacture, and finally they come to a point where they have a worthless plant, because not kept in good repair, and yet they inventory it at its original cost. I remember a number of years ago when I was interested slightly in a manufacturing concern in Cincinnati, and fortunately I was interested with a number of gentlemen who represented a number of lines; they were bright men and understood their business. I heard a number of discussions at the time we were making an inventory, and this rule was laid down by these gentlemen as being a correct rule to follow: In 99 cases out of 100 you should deduct from the original cost of the plant 25 per cent. the first year and if you kept it in a reasonable state of repair you should deduct 10 per cent each year thereafter, and that that was the only safe basis on which to conduct business. Perhaps that may be an exaggeration in many cases. I believe it is so in many cases of brick manufacturing. I believe that estimate is placed too high. I am certain it is quite too low in others. One other thing. Whenever you hear a brick manufacturer talk about his plant not having cost him anything for repairs and that everything has gone smooth and he has gone sailing on right along, you can put it down that he has not made very many bricks. You can not manufacture clay products of any kind without great wear on your plant. There is no line that is so hard upon machinery as that of handling clays. It is impossible to regulate a line of machinery for

handling clays so as to anywhere nearly approximate the amount of power required to run that plant from one minute to another. Take the dry pan, for instance. At one minute it may require fifty horse power and the next ten. It is a continual shift change, and it is just the same with the brick machine. Of course, if the clays are properly prepared and pugged by the time they get to the machine the amount of power required from one minute to another perhaps does not change with such great rapidity, but there is a continual change; and so it is all over the entire plant, and there is no way of regulating it. And the amount of fuel you will use in your kilns and the kind of men you use to handle your kilns calls for continual change. The material with which you build and repair your kilns undergoes a continual change. These are facts that are much more prominent in the manufacture of clay wares than any other lines I know anything about personally. So that the clay manufacturer should be very careful to take these things into consideration when making up his annual statement. [Applause.]

Mr. Batley: I am one of the unfortunate machine men. I think that Dr. Converse's paper was read with the best of intentions. I too think that the cost of the manufacturing of brick have been exaggerated. Only the other day I met a representative brick manufacturer from Chicago, and speaking of the cost of brick and the price of manufacturing he said he would make brick and deliver them down town at less than \$3.00 a thousand. I have been familiar with the process of brickmaking from my childhood days in 1859 up to the present, and I say there is no brickmaker in the market who can make brick and deliver them for \$3.00 a thousand. I do not care by what process he makes, and I want to give you another illustration of the trials and tribulations of a brickmaker. Some years ago we sold a brick plant in our own State of Ohio. Friend Eudaly knows the place well. In this firm there are probably fifteen or twenty stockholders, and there has no two years gone by that they have had the same superintendent. In 1897 they changed their superintendent and took one directly out of a dry goods store—one who had never made a brick in his life. In the month of October we received a letter in our office saying the brick were all laminated and to send an expert there at once. I went down there and I looked over the plant, and I said to the superintendent, "Open up your machine," and he did, and gentlemen, the augers in that machine were completely worn out; there was not one any larger than the diameter of any black hat over there on that rack. I sent for a new set, put them in the machine and it worked all right. The superintendent said he did not understand it, and it was simply because he did not understand his business or he would have known the cause of his lamination. There are a great many of the trials and tribulations of brickmakers to-day caused by superintendents who know no more about brickmaking than a child just born. It is just as practical to think that I could go down on the street and set up a watch factory and be successful as it is to expect a man to come out of the dry goods business and make brick.

President Purington: To illustrate more fully the power it takes to handle clay, we all know what wonderful power electricity has and the great many appliances to which it can be attached. Three

or four years ago an electric company—it is known to-day as the General Electric Company—tried to run a steam shovel in a Chicago clay bank and they gave it up as a total failure. Another thing, I would like to ask Dr. Converse in regard to the valuation of his plant, as to whether he charges all his repairs to his different machines and kilns, to the manufacture of brick or to the kilns and machinery and then takes off his per cent., or whether he charges it to brick-making and then takes off the percentage.

Dr. Converse: We charge up to our brick kilns and machinery a certain percentage and then deduct. We charge to repairs everything that is made as a repair. Then we finally wind up with a deduction of a certain percentage, nearly 10 per cent., for wear and tear.

President Purington: We used to do that for a great many years, but in the last few years we have changed that method and are more satisfied. We fix a valuation on the plant and we keep it at that valuation, and every cent that is spent on that plant for any article is charged direct to the manufacture of brick, with the supposition that during the year we have expended enough on the plant to keep it up to a working condition. I understand a great many factories carry on their business that way.

Mr. Loy: Some time ago a gentleman advertised in the clay papers for an experienced man to superintend his factory, which was located in northern Iowa. I was looking around for something good, so I answered his advertisement, and he wrote me, saying if I would come he thought I would find everything satisfactory; that while he wanted to employ a good man, still if I was pleased with the place he would sell me a one-third interest. I went to see him and he offered to sell me a one-third interest in his plant for \$17,500 and the investment was not very large; probably \$10,000 would build a better plant, and I asked him why he wanted to sell his plant. He said, "I can make plenty of money on it." I said, "Well, why do you want to sell it?" and he said the trouble was he spent all he made for repairs. He did not understand the business, and that is the way with a great many owners of tile factories.

Secretary Stoll: This brings us to report of Treasurer. But before we have that I have a letter here from the Mayor of Peoria.

—After the Next Convention.—

The Secretary then read a letter from the Mayor of Peoria, in which he extended a very cordial invitation to the Illinois Clayworkers' Association to hold their next annual convention in Peoria.

President Purington: If there are no objections this matter will be referred to the Executive Committee.

Mr. Elder: While this matter is before us, in behalf of the brick manufacturers of Bloomington I desire to extend an earnest invitation to this organization to hold its next annual Convention in the city of Bloomington. We are centrally located, with good railroad facilities; we have good hotel accommodations (and plenty of good water to drink) [laughter], and if you will come we will give you a hearty welcome, treat you right and try in every way to make the Convention a success. I have no idea we can give you as fine entertainment as we have received here in Decatur, but we will do our very best. Our Mayor joins with us in extending this invitation, and we sincerely

cerely hope it will be accepted and that a year hence we of the Pioneer city of Bloomington will have the pleasure of extending the glad hand of welcome to every member of this Association [applause].

President Purington: In behalf of the Association, I wish to thank the Mayor of Peoria and also the brickmakers of Bloomington for their kind invitations. The matter will be referred to the Executive Committee.

Mr. Stookey: If the Association is willing, I would like to ask Dr. Converse one question. He made a statement that he has made brick and sold them for less than they cost him. This is a statement of affairs that I can not understand. I do not know why a man should do that, and I would like to ask why.

Dr. Converse: Competition.

Mr. Stookey: Did you have to sell them?

Dr. Converse: Yes, sir; I had to sell them or not keep up with the crowd.

Mr. Stookey: Had you not better drop behind?

Dr. Converse: No, sir. We had to do business with business men and we had to sell brick as low as our neighbors or get out of the business.

Mr. Pike: He told me confidentially that a man wanted to borrow \$3,000 and he sold his brick at a discount to get the \$3,000 to loan him [laughter].

Dr. Converse: Let me say a word. While the laws of Illinois have given us a little relief in this matter, still we almost have to whisper about it. Our President smiles. We have in our place about four or five brickmakers, and there are times when some of them have just got to have money—they have put their money into brick and it is there and they are not receiving any benefit or profit, and they think they had better turn them over and realize a benefit, and as a result, if anybody is in a different condition they have got to meet prices or lose their customers. Brickmaking is not unlike dry goods or groceries; if a man wants to do business he has got to keep in line with the trade or get out. There has not been any opportunity to make any arrangement locally by which a fair profit might be realized. While I am not an advocate of combines or trusts, I do think there is such a thing as people protecting themselves, and I can see no reason why a community or locality engaged in a certain manufacture should not have an understanding that will result in profit, instead of cutting each other's throats. This is not only the condition of things at Springfield, but it is true of every other place. People have been clamoring for something cheap, and if you offer them something for a dollar they want it for 75 cents. It is one of the things that has come about during these close, stringent times. I am looking for a time when people will stop quibbling over a fair compensation for a good article.

Secretary Stoll: This brings us to the report of the Treasurer.

Treasurer Townsend: I have not much of a report to make:

Amount on hand from last year..	\$73.08
Amount collected and received	
from Secretary	66.00
Amount now on hand.....	\$139.08

Mr. Pike: This is an improvement over last year's report and I move the report of the Treasurer be accepted and placed on file.

Motion duly seconded and carried.

Secretary Stoll then submitted his report, which showed a slight increase in membership and a balance on the right side of the ledger after all bills were provided for.

It was moved by Mr. Hammerschmidt that all bills be paid. Seconded by Sol-fisburg and carried.

Secretary Stoll: The next is the report of the Committee on Resolutions.

The report was read by Mr. Plumb, as follows:

REPORT OF COMMITTEE ON RESOLUTIONS.

Whereas, the Illinois State Fair is now permanently located at Springfield, and the clay industries of our State are assuming such proportions as in our estimation justifies recognition of its magnitude by the State at its annual exhibit, it is

Resolved, by the Illinois Clay Workers' Association in assembly at Decatur, Ill., January 6, 1898, that we most earnestly request the Illinois State Board of Agriculture to make such proposals and inducements as will be an incentive to our craft to make an exhibit, and to place the exhibit of this Association in a suitable building on the Fair Grounds; and this Association hereby pledges all assistance possible to make an annual creditable exhibition.

This Association, now about to close its session, takes pleasure in extending its thanks to the local committee of arrangements of the Decatur brick-makers, and the "Leader" Manufacturing Co., to-wit: Messrs. Albert Ammann, Sherry Tuttle and Davis Brown, for the complete and satisfactory manner in which they have provided for every want of this Association.

We also wish to thank the local press of Decatur, which has so fully and impartially reported the proceedings of this Association.

We thank the managers of the railway companies for the generous tender of their cars to enable the members of our Association to visit the various industries in the city.

We wish to put ourselves on record in our hearty appreciation of the banquet tendered our members by the local brick-makers, and the Leader Manufacturing Co., at the St. Nicholas Hotel, and presided over so ably by Judge Nelson as toast master.

The retiring officers of this Association have our thanks for their labors in advancing the interests and welfare of this Association.

F. Plumb,
E. M. Pike,
J. M. Mamer,
Wm. Hammerschmidt,
A. A. Harrington.

Mr. Plumb: In behalf of the Committee, I move its adoption.

Motion seconded by several and carried.

Secretary Stoll: The next on the programme is the

ELECTION OF OFFICERS.

Mr. H. Ammann: Mr. President, I speak in behalf of the Decatur brickmakers: Knowing full well that it has been the custom of this Association to select its President from the town in which they have held their meeting, and knowing also that the office of President is an important position, none of the brickmakers of Decatur care to assume the responsibility and serve in that capacity, and I would like to nominate instead of a Decatur brickmaker a man capable of filling the office to a nicety, Mr. H. F. Townsend, of Avon.

W. Hammerschmidt: I second the nomination.

Mr. Townsend: I want to nominate a Decatur man. I—

Mr. Plumb: I will relieve the gentleman of any further embarrassment. I move the rules be suspended and the Secretary be instructed to cast the unanimous vote of this Association for Mr. Townsend for President.

Motion was seconded by Mr. Pike and carried.

Secretary Stoll: The ballot has been

cast and I declare Mr. Townsend duly elected.

Mr. Hammerschmidt: As Decatur does not want the Presidency, I nominate Mr. Henry Ammann for Vice-President. I move a suspension of the rules and that the Secretary cast the ballot for Mr. Ammann.

Motion seconded by several and carried and Mr. Ammann declared duly elected Vice-President.

Mr. Pike: It is well in some instances to make changes. For instance, it was a good thing to change the location of the Convention and to change the President; quite a good thing for the country to have a change politically, but there are some things it is not good to change. We have a Secretary who has worn himself bright in the service; he knows what we want—he is, in short, the Convention himself—and around him revolve all the duties and embarrassments, and if anything goes wrong we blame it on the Secretary. He is accustomed to it all, and without going any further I nominate the present incumbent, Mr. G. C. Stoll for Secretary and suggest that the rules be suspended and that President cast the unanimous vote of this Convention for him [applause].

Motion seconded by Mr. Mamer and carried.

Secretary Stoll: The next is the Treasurer.

Mr. Loy: Since our money must all be handled with care, I nominate for Treasurer Mr. Wm. M. Stare.

Mr. Plumb: I am not going to be bluffed off by a poem. I believe in distributing these little favors around geographically over the State. I nominate Mr. J. M. Mamer, of Campus. He is always here. If he has missed any Convention it has been one when I was not here, for I have always found him on hand.

President Purington: I will appoint as tellers Mr. Elder, Mr. Ammann and the Secretary.

A counting of the ballots by the tellers showed Mr. Stare to have received 19 votes and Mr. Mamer 13.

President Purington: I declare Mr. Stare your Treasurer for the coming year.

I will ask Mr. Hammerschmidt to escort the newly elected officers to the platform. As I am about to retire from the office which I have held for about one year, I assure you that I have had much pleasure in serving such a body as is present. I can sympathize with your newly elected President, because I was about in his position a year ago, only I was called up to the chair without any warning by Mr. Plumb and I have not forgiven him yet. I wish to thank you for your kindly assistance you have given me in presiding over this meeting, and I trust that the Association will improve and increase in numbers as it has in the past few years. I thank you for the courtesies you have shown me and I take pleasure in introducing to you your new President, Mr. H. F. Townsend.

President Townsend: Brother Clayworkers, I can only wish for the tongue of Brother Adams. I would not care which did the talking, the tongue or the teeth. There is a little girl in our neighborhood about three years old, one of those little personifications of innocence that go to make home happy. She has been going to Sunday school and she has learned two or three texts. She was over to a neighbor's a few days ago and a blessing was asked at the table. Her people do not do that, and it struck her as funny or strange. The next day at

the table she said, "Mamma, can I talk to the tablecloth?" Her mamma said, "Yes." Her father and mother kept quiet and she said, "I am with you, amen." Brothers, I am with you, amen. I feel there is one way we can make a success of this Association. I am a clay-worker and I expect to continue a clay-worker for many years to come. I like the business. It is just about dirty enough to suit me. I think there is not a member here but who has enjoyed this meeting fully as much, if not more, than any meeting we have ever had. I know this is my experience, and I believe our meetings will keep on improving. I am going to set my stakes for an attendance next year of 100 [applause], and with your hearty co-operation I know we can make it a success.

Mr. Hammerschmidt then introduced Mr. Ammann.

Mr. Ammann: Gentlemen, as a speech maker I am a failure. You no doubt have found that out by this time, but I am very glad to have this honor bestowed upon me. This is the first time I have ever met with your Association, and I will say that I was more than pleased with this one and will try to be with you at the regular meetings from now on [applause]. I did not have any idea they were so good. Words are not at my command this afternoon to thank you for the honor you have conferred on me in making me your Vice-President. Again I thank you. [Applause.]

Mr. Hammerschmidt: Gentlemen, you all know the Secretary. He needs no introduction.

Mr. Stoll: Gentlemen, I thank you ten times—I think this is the tenth year I have been Secretary of the Association—and I rather congratulate myself upon having such good health all the time. It has been a little discouraging at times in getting the brickmakers to take places on the programme, but I have had no trouble to speak of. I hope another year to have as good a programme as we have had this, and with your co-operation I think we can have as good a meeting—I do not think we can have a better—but I want as good a one, and I will do my best to please you, as I have in the past. [Applause.]

Mr. Hammerschmidt: I now introduce your Treasurer, Mr. Wm. Stare.

Mr. Stare: I thank you for the honor you have conferred upon me and I shall try to fulfill the duties of the office as best I can. I will do everything I can to help the Association along. I do not think I have missed but one meeting in the last thirteen years, and that year I was in California. I will try to keep plenty of money in the Treasury. [Applause.]

Secretary Stoll: We have sixty-six members enrolled this year, as against fifty-nine last year. [Applause.]

Mr. Randall: I am glad the Secretary made that last announcement, because it shows progress. It shows that while we may have made mistakes as brick manufacturers, there was no mistake made in coming to Decatur, and if we can continue to increase our membership a little as we have the past year it will not be long until the Association will be back to a prosperity basis.

Secretary Stoll: I have a telegram from the Vice-President, J. W. Skinner, saying he was detained at home, but that he will remit his membership fee and be with us next year. [Applause.]

On motion of Mr. Randall, seconded by Mr. Lambert and others, the Convention then adjourned subject to the call of the Executive Committee.

THE BANQUET.

The most enjoyable feature of the Illinois convention was the banquet tendered the visiting clayworkers by the brickmakers of Decatur and the Leader Manufacturing Company. It was served in the dining room of the St. Nicholas Hotel, where a hundred plates were laid. At 9 o'clock sharp the doors were thrown open and the guests filed in, keeping step to the music of a mandolin orchestra. The room was prettily decorated with palms and flowers, and at each plate was a posy and a souvenir card bearing the following menu:

Blue Points.	
Consomme Jardiniere.	
Celery.	
Olives	Radishes.
Boiled Salmon.	Hollandaise Sauce.
Parisienne Potatoes.	
Chicken Patties.	
Browned Potatoes.	French Peas.
Boned Turkey.	Aspic Jelly.
Boiled Ham.	Tongue.
Mareschino Punch.	
Stuffed Roast Quail.	Cress.
Fresh Shrimp Salad.	
Neapolitan Ice Cream.	Assorted Cake.
Fruit.	Salted Mixed Nuts.
Coffee.	

This elaborate dinner was well served and at 10:45 cigars were passed, Mayor Taylor himself directing this part of the programme, and the Toastmaster, Judge W. E. Nelson, called for order. His venerable appearance, friendly manner and ready wit made him popular from the start. He is a gentleman of the old school and will ever be remembered kindly by the visitors, each and every one of whom seemed to enjoy the "flow of soul," which continued until 2:00 a. m. Even at that late hour the company seemed loath to say good night and retire, not a few lingering in the lobby for another hour.

The fact that the best of order prevailed and closest attention was given every speaker to the very last is of itself the highest praise that can be paid the speakers. The list included Judge W. E. Nelson, W. S. Purington, Galesburg; D. V. Purington, Chicago; Mayor Taylor, E. M. Pike, Chicago; W. A. Eudaly, Cincinnati, Ohio; R. R. Montgomery, Decatur; Dr. A. L. Converse, Springfield; Alderman George De Witt, Decatur; T. A. Randall, Indianapolis; J. C. Adams, Indianapolis; John Mattes, Decatur; D. W. Stookey, Cedar Rapids, Iowa; W. D. Gates, Chicago; Alderman Jas. Keefe, Decatur; D. O. Loy, Atkinson, and A. F. Townsend, Avon.

We will not attempt even a brief outline of the speeches, which were in turn instructive and amusing, serious and gay. Those who neglected to attend, thinking to get the full benefit of the convention by reading our report will miss much, in this feature at least. President-elect Townsend brought the exercises to a close by singing "Illinois," a happy ending of a most enjoyable feast.

—The Trip to the Brickyards.—

Thursday morning the visitors were taken for a short trolley ride through the principal streets to the Union Depot, where a special train was waiting to convey the party to the brickyards. The first stop was made at the works of the Mattes Brick Company, which was gone over thoroughly and we then moved on to the works of the Tuttle Brick Company. Both plants were fully described and illustrated in the December Clay-Worker. The latter plant, however, had

been overhauled since our former visit and new machinery installed by Davis Brown, which gave it the appearance of a new plant. From here the party walked to the works of the Decatur Leader Manufacturing Company, where they inspected the facilities of that enterprising concern for making the machinery with which their brick and tile are made. The shops are large and well equipped. The wheels buzzed and whirled a merry tune of industry that told of better, happier times. As we made our way back to the hotel many were the compliments paid Davis Brown and the Decatur brickmakers for the successful manner in which they handled the whole affair.

—In the Ante Room.—

There was no exhibitions of machinery or models, but one of the ante rooms was monopolized by the machine, kiln and dryer firms, who sent representatives, with catalogues and other trade literature, which was here displayed and offered to any who might care to possess them. As Mr. Batley stated, machine men do not attend conventions so much for the purpose of booking orders as to learn the needs of the trade and get acquainted with those who may subsequently be in the market for their appliances. Nevertheless, some sales were made and the general feeling of hopefulness and good cheer among the "missionaries" was very noticeable.

LIST OF MEMBERS.

Thos. Trainor, West Chicago, Ill.
J. M. Mamer, Campus.
N. L. Mamer, Campus.
Frost Manufacturing Co., Galesburg.
Wm. Hammerschmidt, Lombard.
W. S. Purington, Galesburg.
H. F. Townsend, Avon.
J. B. Clemans, Anderson, Ind.
Wm. Stare, Mendota.
T. A. Randall & Co, Indianapolis, Ind.
A. R. Batley, Bucyrus, Ohio.
D. V. Purington, Chicago.
A. C. Solisburg, Aurora.
A. L. Solisburg, Aurora.
J. M. Powell, Orestes, Ind.
C. C. Barr, Streator.
G. M. Ashby, Chicago.
Clark & Pickard, Minonk.
D. E. Kretsinger, Egan.
F. Plumb, Streator.
John Kloess, Belleville.
Oliver Tilbury, Towanda.
R. McShane, Lostant.
W. A. Eudaly, Cincinnati, O.
H. M. Baldrige, Illinois.
H. Brewer & Co., Tecumseh, Mich.
Elder & Dunlap, Bloomington.
Chicago Brick Machinery Co., Chicago.
F. E. Swift, Washington, Ia.
L. H. Lambert, St. Mary's.
G. C. Stoll, Grant Park.
H. C. Patton, Flanagan.
Wallace Manufacturing Co., Frankfort, Ind.
Maroa Brick and Tile Co., Maroa.
Leader Manufacturing Co., Decatur.
D. O. Loy, Atkinson.
George J. Hartwell, Chicago.
S. A. Tuttle, Decatur.
J. C. Ammann, Decatur.
T. Lincoln, Colfax.
L. C. Farnam, Pawnee.
D. M. Duddleston, Stewartson.
E. M. Pike, Chicago.
J. J. W. Billingsley, Indianapolis.
J. F. Martin, Arthur.
C. M. Walker, Adrian, Mich.
M. J. Lee, Crawfordsville, Ind.
J. D. Jensen, Pekin.
D. W. Stookey, Cedar Rapids, Ia.
A. L. Converse, Springfield.
G. J. Walters, Chatsworth.
D. A. Farnam, Zenobia.
W. D. Gates, Chicago.
David Davis, Litchfield.
C. N. Furr, Bement.
R. Thomas, Newman.
H. V. Cook, Odin.
J. G. Shea, Danville.
H. Major, Dixon.
F. Lehman, Chicago.
H. Haigh, Catskill, N. Y.
J. W. Skinner, Varna.
J. C. Adams, Indianapolis.
Henry Ammann, Decatur.
Davis Brown, Decatur.
Jesse Johnson, Varna.
J. F. Mattes, Decatur.



OFFICIAL ANNOUNCEMENT.

**Pittsburgh the Place, February 15-18 the Time,
for Twelfth Annual Convention of the National
Brick Manufacturers' Association.**

To the Members of the N. B. M. A.:

AS PREVIOUSLY ANNOUNCED, the next annual Convention of the National Brick Manufacturers' Association will be held at Pittsburgh, Pa., Tuesday to Friday, February 15 to 18, 1898. Pittsburgh's central location and unsurpassed railway facilities make it an especially desirable point for conventions of all kinds. Her great clayworking interests, and the fact that her representative brick manufacturers have been identified with our Association in years past, make it peculiarly available for us at this time.

—Hotel Headquarters.—

The meetings will be held in the banquet hall of the Monongahela House, which hotel will be headquarters during the Convention. Delegates and those accompanying them will be accommodated at a uniform rate of \$3 per day, excepting, of course, those who desire special accommodations, such as parlors, rooms with bath, etc., for which the rate will be \$3.50 to \$6. Those who will be accompanied by ladies and others desiring special accommodations are requested to write to the hotel direct, ordering reserves, stating exact time of intended arrival, and the character of accommodation desired.

—Reduced Railroad Rates—

Have been secured on the certificate plan; that is, delegates and those accompanying them, if they pay full fare going and *take a certificate for same* from the ticket agent, will be entitled to return tickets at one-third the regular fare, making two-thirds rate for round trip. Those starting from small towns should make inquiry from local ticket agent a few days in advance, to insure the receipt of proper certificate. Where same cannot be obtained, however, a receipt from the ticket agent bearing *official stamp of ticket office*, and stating that it is for full fare and in lieu of regular certificate, will suffice. *Those desiring certificates should present themselves at the ticket office at least thirty minutes before departure of trains.*

—Exhibition Hall.—

A suitable room in the Monongahela House has been engaged and proper facilities will be provided for the exhibition of specimen brick, trade literature and small models of machines. Any one desiring extensive space or power for the operation of machinery is requested to confer with John McLaren, Secretary Committee on Arrangements, 1002 Liberty street, Pittsburgh.

—The Programme.—

FIRST SESSION, TUESDAY, 2:30 P. M., FEBRUARY 15TH.

Prayer.

Enrollment of members and roll-call.

President's Annual Address—Wm. H. Brush, Buffalo.

Report of Treasurer—John W. Sibley, Coaldale, Ala.

Election and installation of officers.

Appointment of committees.

"Looking Forward," address by J. C. Adams, Indianapolis,
Discussion to be led by ———.

(Note.—No papers or essays not included in the regular programme will be heard unless previously submitted and approved by the Executive Committee. At the close of each

essay or address, the subject under consideration will be fully discussed.)

—Tuesday Evening, 8:30 O'clock.—

Informal reception and collation in the banquet hall of the Monongahela House, tendered by and given under the auspices of the Pittsburgh brick manufacturers.

SECOND SESSION, WEDNESDAY, 9:30 A. M.

"The Use of Electric Tramways in Hauling Clay," Charles W. Eiker, Chicago, Ill.

"Burned Clay as a Fire-Proofing Material," W. D. Henry, Pittsburg, Pa.

"The Refractory Qualities of Clays," Prof. Edward Orton, Jr., Columbus, Ohio.

—Questions for General Discussion.—

What is, or should be, the standard size of Roman brick?

Have continuous kilns proven successful in burning face brick?

Will any salmon brick withstand exposure to freezing?

How much water can a brick absorb and yet be safe from frost disintegration?

Does not saltpetering injure salmon brick as much as frost?

Have not brickmakers made a mistake and sacrificed the artistic effect by too close shading for color in trying to produce a monotone front?

Does the use of oil as a fuel increase the fire hazard?

THIRD SESSION, WEDNESDAY, 2:30 P. M.

"The Economy of Brick as Compared with Frame Structures," R. N. Buell, New Britain, Conn.

"Drying Brick in Kiln by Use of Heat from Cooling Kilns," S. H. Alsip, Belleville, Ill.

"Experimental Work, Wise and Otherwise," E. E. Gorton, Terra Cotta, Ill.

—Questions for General Discussion.—

Is drying up-draft in a down-draft kiln an economy?

Does it pay to cover the top of an up-draft kiln with earth?

How are ornamental brick generally burned in an ordinary dry-press yard?

Is air-pressure as good as steam in the use of oil for burning brick?

How can finger-marks on face brick be avoided?

Is the standard size of common and face brick adopted by the N. B. M. A. generally adhered to? If not, what further can our Association do to maintain the standard?

What is the best metal for making dies for ornamental brick?

—Executive Session.—

At 4:30 p. m. the Convention will go into Executive Session for the consideration of the Association's private business. All reporters will be excluded, and no published report will be allowed of this part of the proceedings.

FOURTH SESSION, THURSDAY, 9:30 A. M.

"Why Some Brickmakers Live in Wood Houses," T. D. Potter, Gardner, Mass.

"Brickmakers' Accounts," W. H. Hoagland, Cayuga, Ind.

"Brickmaking in the Far Northwest," Walter S. Bowen, Little Falls, Wash.

"Brickyard Construction," Frank W. Butterworth, Marion, Indiana.

—Questions for General Discussion.—

Is burning brick with producer gas a success in Europe? If so, why is it not introduced in this country?

Is it practicable to make gas from bituminous slack for burning brick?

Which is the best way to set and burn fire-flashed or impervious face brick?

Is it best to set dry-press brick in the kiln direct from machine, or to pass them through the dryer, economy in drying and quality of brick considered?

Is it either economy or good policy for brickmakers to use iron stacks about their own works?

Will an iron stack do as good work on a continuous kiln as a brick stack?

FIFTH SESSION, THURSDAY, 2:30 P. M.

"Manufacture and Use of Press Brick in the South," Lee Dunn, Lake Charles, La.

"Soft Mud Brick," C. L. Merrick, Syracuse, N. Y.

"The Advancement of Paving Brick Tests," Arthur W. Sewall, Pittsburg, Pa.

Report of Paving Brick Commission.

—Questions for General Discussion.—

How is clay calcined and what is the cost? If it can be done cheaply, would it be feasible and beneficial, in the manufacture of paving brick, to use a small proportion of calcined clay with shale that vitrifies too readily? What would be the effect on the brick?

How fine should shale be ground to make the best pavers?

Should a kiln of pavers be closed up absolutely tight after the burn is finished?

Does age, when in use, or when under cover and not exposed directly to weather, improve brick in resistance to abrasion?

Can paving brick be burned successfully in the continuous kiln?

How can the element of noise in brick pavements be obviated or minimized?

Can a given load be hauled over a brick pavement more easily than over asphalt?

—Reports of Committees.—

—Miscellaneous Business.—

FRIDAY, FEBRUARY 18TH.

Under the guidance of the Local Committee on Entertainment, delegates and those accompanying them will go on a boat excursion about the city, visiting Davis Island, lock and dam, inspect the water front on both the Allegheny and Monongahela rivers, proceeding up the latter several miles, after which visits will be made to the great glass, coal and iron manufactories. During this trip refreshments will be served, and if the weather is propitious the trip will be a delightful one.

—Membership Badge.—

Each member of the Association and accompanying ladies will be presented with an appropriate souvenir badge, the gift of the Pittsburg brickmakers, which will of itself be the open sesame to all entertainment and social features.

Brickmakers of America are each and every one cordially invited to attend the Convention and participate in the deliberations. Those from across the water, if any there be who can attend, will also be made welcome. Those desiring information relative to requisite of membership, etc., are requested to address the Secretary at Indianapolis.

THE EXECUTIVE COMMITTEE,

WM. H. BRUSH, President.

THEO. A. RANDALL, Secretary.

THE FOUR-YEAR-OLD SENDS GREETING.

Friend Randall—I have just learned with sincere sorrow of the death of James Dingee, of Philadelphia. Foremost among all the long list of old friends whom I hoped to meet and greet again during the Convention is the name of James Dingee. Despite his physical infirmities, his was an exceptionally genial and kindly personality. A royal entertainer himself, we had hoped to repay in part some of his many courtesies and enjoy with him another of our old-time reunions, which are so enjoyable to the older members of the N. B. M. A. This may not be, but we will long hold his name in loving memory.

Now, Friend Randall, you ask me, as a member of the Entertainment Committee, to tell what we are going to do to the members of the N. B. M. A. when we get you to Pittsburg. Now, seriously, you do not expect me to give the whole thing away, do you? I know something about past Conventions. I know what other cities have done, and can assure you that Pittsburg will not take a back seat, but will prove equal to the occasion. To those who ask you what we are going to do, say, "If you really want to know, go and see." All the brickmakers need do is to come; we will do the rest; they won't even have to "push the button." Remember the day and date; examine your ticket; see that it reads "To Pittsburg;" that's all you have to do.

To avoid embarrassment to any of the country brethren who may feel the least bit timid about the trip, will say, if they will observe the above suggestions and arrive safely in Pittsburg, the Reception Committee will take good care of them thereafter.

Suppose a word or two about Greater Pittsburg is in order. First, let me say that since we took to using gas for fuel, Pittsburg is not so smoky that one cannot recognize his neighbor in broad daylight on a clear day, but I do not want to be understood as intimating that gas is so abundant here that any member will be justified in leaving at home his individual plant for generating the kind of gas that both illuminates and warms a Convention. Bring that with you, and see that it is in good running order.

Of course, we will not be behind outlying towns, such as Buffalo and Chicago, in the matter of social entertainment. Not to be outdone by any of the other Convention cities, we have a number of committees that will look carefully after all details. For instance, provision has been made to obviate the necessity of those brethren who do not wear "spike-tails" at home providing dress suits for this special occasion. Our dress-suit man, D. C. Cawley, has been appointed a committee of one to provide "spike-tails" for visitors. No one need bring one; just call on Cawley.

There will be a working committee of ladies, who hope to make the week a very pleasant one to the visiting ladies, affording them such entertainment as they themselves most desire. They will find many things to interest and amuse them here in Pittsburg, and it is hoped that a large number of delegates will be accompanied by their wives and daughters.

While we expect to look after the comforts and pleasures of the visitors from start to finish, Friday will be OUR day. We



The Monongahela House, Pittsburg.

are going to show you about Pittsburg—give you all a boat ride, with the usual accompaniment of music, refreshments, etc., which we hope will prove pleasant and enable all to return home with a better idea of our city, its resources and attainments, than you otherwise would have. Just say to the brickmakers of the country that we are going to keep open house; all who come will be made welcome and, we hope, happy.

Sincerely yours,

Pittsburg, January 9th.

EDWIN C. MCGRAW.

CHICAGO TO PITTSBURG.

The Convention Delegation to Be Chaperoned By Gates.

Chicago, Ill., January 14, 1898.

Editor Clay-Worker:

Dear Sir—I find, on hasty canvass, that several persons have engaged transportation to the Pittsburg Convention from here via the Baltimore & Ohio Railroad, and I write this to urge all who will attend the Convention to make arrangements to go at the same time, and thus make up a congenial party, as we have done on several other occasions. A rate of a fare and one-third

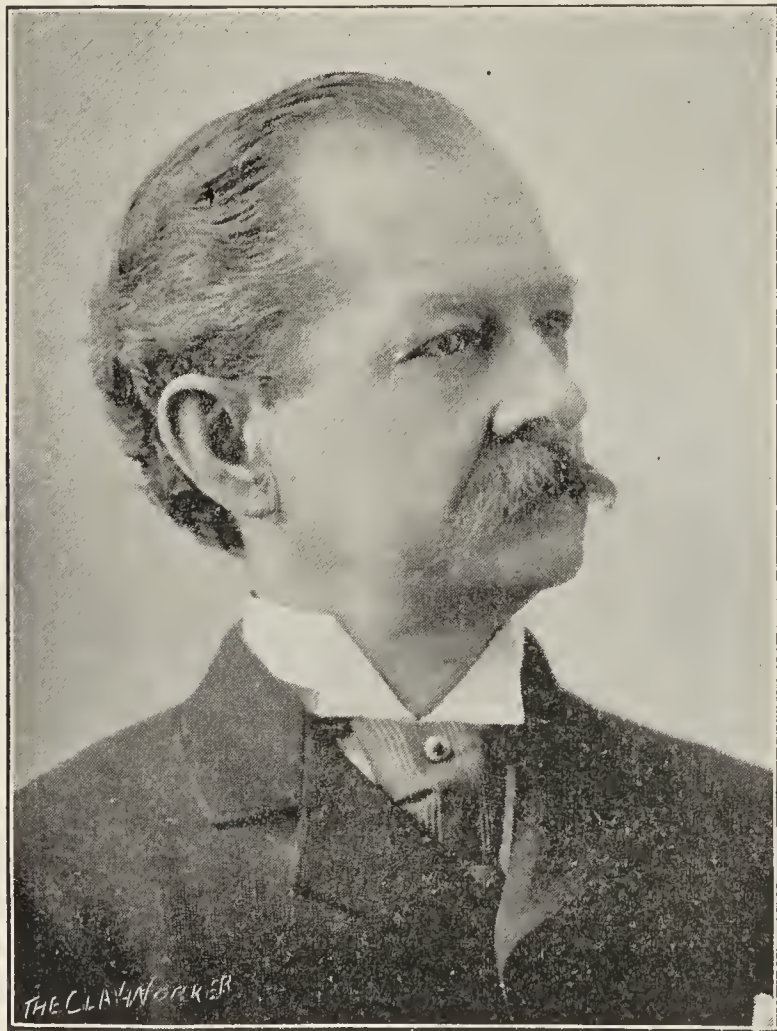
on the certificate plan has been granted, which makes the round trip rate \$14.70. The sleeping-car fare will be \$2.50 for a double berth. A special Pullman sleeping car for our exclusive use will be attached to the B. & O. train leaving the Grand Central Passenger Station, corner of Fifth avenue and Harrison street, at 3:30 p. m., February 14th. Dinner will be served in the dining car. This train will arrive in Pittsburg at 7:45 a. m. the following day. All those who desire sleeping-car accommodations should address W. W. Picking, City Passenger Agent B. & O. R. R., 193 Clark street, Chicago, who promises to take good care of all who go. Hoping for a jolly visit the first night out, I remain,

Sincerely, WILLIAM D. GATES.

OBITUARY—DEATH OF JAMES E. DINGEE.

PHILADELPHIA mourns the loss of one of her best-known brickmakers, and the members of the National Brick Manufacturers' Association and readers of the Clay-Worker generally will learn with deep regret that James E. Dingee has passed over to the hosts of the great and silent majority.

His death occurred on the 26th of last month at his home,



THE LATE JAMES E. DINGEE.

No. 1707 Master street, uremia being the direct cause. Although Mr. Dingee has been a chronic sufferer from muscular rheumatism for many years past, it was not until the end of October last that he complained seriously of his trouble to his immediate family, while spending the autumn months at his country residence at Grubbs Landing, Delaware county. The disease taking the form of ophthalmia caused Mr. Dingee to complain of the coal oil lamps, believing his inability to read his papers at night due to the poor light. He prevailed upon his wife and daughter to return and take up their abode in their winter residence in the city.

Being advised to go to an optician, he was immediately informed that he needed the services of an oculist, and through the agency of Dr. Closskey he discovered that it was the light of life dying out, the sight of the right eye being entirely destroyed through the excessive use of tobacco. This had communicated also with the nerves of the left eye, and so tortured

with the prospect of going blind, Mr. Dingee braced himself with heroic fortitude and called in the services of his family physician with instructions to deal with him truthfully and without fear. In this undoubtedly his best hopes were shattered and he learned too late that the entire human machine was out of gear.

Consistently, however, with his entire philosophy in life, he bore up bravely against the inevitable, and attended yard, office and other duties until the end of November, when, unfortunately, he took cold, and this confined him to the bed on which he passed away, watched over by his loving wife and daughter, also his brother, Henry C. Dingee, who for many years has been associated with him.

James E. Dingee was born in Philadelphia in 1840. His father, Edmund Dingee, well known before him, owned the brickyard at Twelfth and Chestnut streets, where real estate now brings \$6,000 a front foot. Mr. Dingee, Sr., died in 1856, thus leaving James E. Dingee, at the early age of sixteen, to run the yard and carry a load of responsibilities, which he did with an innate pride and force of character that showed plainly on all sides the progressive nature of the man and the heart that responded cheerfully to the humane instincts foreign to many.

Real estate speculators followed closely upon his every move, and just so soon as brick walls began to encroach upon the freedom of his plant Mr. James E. Dingee would move again. Seven moves and three fires are chronicled in the business life of this particular plant. But go where he would, Mr. Dingee always found time to listen to the woes of others, and his hand always responded to the promptings of his heart where widow or workman needed help.

The plant now located at Twenty-sixth and York streets, covers twenty acres. From an output of 250,000 bricks annually the capacity was increased by forty-one years of actual supervision and good judgment until the annual capacity reached 38,000,000.

In politics Mr. Dingee was an ardent Republican, and in 1879 was elected to Common Council to represent the old Twentieth ward for four years. He was also a member of the Union Republican Club, and although he has not of recent years been a candidate for any office, he has always kept up an active interest in national and local politics. He was a director of the Northwestern Bank since its foundation in 1888, and has been closely identified with and in the development of real estate operations in the northwest section of the city, where he erected over 300 houses and many large buildings.

The funeral, which took place on the 29th of December, was attended by full Masonic rites, Mr. Dingee being prominent as a Mason and an Odd Fellow and always an influential member of the Master Builders' Exchange.

Mr. Dingee leaves an estate valued at \$100,000, and with his usual past forethought and big heartedness, divides this among his immediate family, directing that his executors, Albert H. Dingee and Arthur Moore, continue his business jointly with his brother, Henry C. Dingee, for five years after his death, his brother to receive one-half of the profits.

Thus closes a life that once was full of rare good qualities, a thoughtful head acting in harmony with a generous heart and a mind ever moving in the cause of progression and good work. In this, the new-born year, let every member of the National Brick Manufacturers' Association see to it that when the light dies out reflection will be made bright by the thought that you too have done your part nobly and as well.

W. P. LOCKINGTON.

IT IS ALL SUFFICIENT.

Editor Clay-Worker:

Enclosed please find check to renew subscription to the Clay-Worker for the year 1898. Should not want to do without it at any price, as I consider it the only clay journal published, or at any rate the only one that I have seen that I should care to subscribe for. Hope to see you at Pittsburg. With best wishes for the New Year, I am

Yours very truly,

DANIEL P. DeLONG.

Glens Falls, N. Y., December 28, 1897.

THE LATCH-STRING HANGS OUT.

Pittsburg is noted the world over for its great iron and steel works. There are many iron foundries there having extensive facilities for the making and handling of heavy castings. One of the pioneer foundries is that of the Fisher Engine, Foundry and Machine Works, which was established by William Fisher in 1857 and operated by him up to the time of his death, on May 5, 1895, when the present proprietors, Phillips & McLaren, assumed control. They had previously been connected with William Fisher, and were familiar with the trade and its requirements. The accompanying illustration give a better idea of the extent and equipment of the shops than a volume of words. Their facilities for doing heavy work can hardly be surpassed. They give special attention to clay-grinding and crushing machinery. Their great hoists and drills and lathes, etc., enable them to make and handle castings weighing tons as

He is known to them all, and to know "Barney" is to like him. With a line of such excellent machinery as the Fate-Gunsaulus Company offer, he will surely get his full share of the trade favors.

BETTER TIMES IN THE SOUTH.

From the reports of local papers we take it that the South is fast getting onto a prosperity basis. At least that is the condition that prevails in Alabama, the home of the popular treasurer of the National Brick Mfgs. Association. The Birmingham papers just now are commenting on some big contracts that have been awarded the Coaldale Brick and Tile Company, including one for several million brick to be put down in Montgomery.

In a recent letter "Master John" writes in a very cheerful vein. He says every day brings inquiries for paving brick



Interior View of a Portion of Phillips & McLaren's Foundry, Pittsburg.

easily as a small foundry does stove plates. They write that they have been very busy for the past few months, and present orders and prospects indicate that that happy condition will continue through the winter. They invite all the brickmakers who attend the coming Convention to visit and inspect their works, which are located between Twenty-third and Twenty-fourth streets on Smallman, one block from Penn avenue, so that any car on the Penn avenue line takes one within hailing distance of their office, which is but a block away from the great fire-brick works of Harbison & Walker, which were fully described in the December Clay-Worker.

A GOOD COMBINATION.

Genial B. A. LaDow is now the Chicago representative of the Fate-Gunsaulus Company, of Plymouth, Ohio. It was intended to make this announcement in their ad., which appears on page 75, but it was omitted through an oversight. "Barney" needs no introduction to the brick and tilemakers of the United States.

from various points in the South, and it seems almost certain that inside of a few months they will have to build a new plant at Coaldale. At the Pittsburg convention he expects to talk with those interested in such plants with a view of putting up works that will command the trade of that section. He now has contracts booked and in sight that call for nearly 15,000,000 brick, and as the annual capacity of his plant is but half that quantity he will evidently have to enlarge his present plant or build a new one.

Heretofore everything in the way of pavements in the South has been of wood or granite. The former has worn out and helped to spread the yellow fever and the latter is a back number everywhere. At Atlanta during the past summer ten blocks of granite pavement were taken up and replaced with brick from Sibley's works, and everyone there now says that the new pavement is the best the city has ever had. The spirit of improvement now prevailing generally through the South will make a great demand for paving material of all kinds, and in the nature of things, chiefly because of its sanitary qualities, vitrified brick will be the favorite material.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

An Example Others Might Follow With Profit.

Editor Clay-Worker:

Enclosed please find \$2, our subscription for the coming year. We have been reading your sample copies long enough, and thought we would surprise you with a remittance. Our firm name is West & McLean, composed of Joseph A. West, of Homestead, Pa., R. C. McLean, Pittsburg, Pa., and L. F. Darral, Jeanette, Pa. We have secured a lease in a very prosperous district in Allegheny City, and think our prospects very flattering for the next few years.

In your December number A. C. Ochs, Springfield, Minn., wishes to know if a gas engine is suitable for brickyard work. Would say that if Mr. Ochs visits Pittsburg during the Convention, in February, we think we will be able to show one in operation. We have contracted with the New Era Iron Works, Dayton, Ohio, for a 100-horse-power gas engine, built especially for us, to be placed ready for work by the 20th inst., and if it is successful we will be pleased to give any information we can.

WEST & McLEAN BRICK CO.

The Home Markets Again.

Editor Clay-Worker:

It appears that my simple endeavors to diffuse a spirit of equity and brotherly feeling amongst the readers of the Clay-Worker generally, and the brickmakers of our Quaker City in particular, affords my Brother "Down-Towner" a fund of amusement, and he forthwith proceeds to exhibit—what appears to him—my folly or weakness, and then proceeds to ridicule and demolish propositions emanating from his own brain, but which he appears inclined to assign to me.

I certainly made no pretensions at humor in the letter which so amused my down-town brother: therefore, to him, at least, it must have a ridiculous or absurd side, which I failed at the time to see, but which is very much in evidence when decked out from the construction wardrobe of "A Down-Towner." Now, Mr. Editor, I must say it appears to me an unkind and an unjust thing to do to array me in clown's clothing, then to ridicule and poke fun at me; and I appeal to you that anything approaching a "tirade" "against the poor down-town brickmaker" (with the large stock of impudence) is not to be found in my quiet, unobtrusive nature. Why, my calm, easy-going and peaceful life has no use for declamation and invective, the principal make-up of a tirade. I think, perhaps, I did betray a little perturbation over that grabbing groceryman who, having twenty-eight stores in Brooklyn and New York, comes to and invades the Philadelphia market with three of his stores. I have now to inform you that he has at this writing thirty-five retail and two wholesale stores in this city!

Now to return to my down-town brother. Are you aware, my dear friend, that the clothing you made for me does not fit? Your arguments are based on your own assertions, not on what I said in my letter. You say, "If Hydro-Carbon is going to," etc., "if Hydro-Carbon wrote," etc., and "if he referred to our firm," etc. Now, it is very strange, but my friend is wide of the mark in all three assumptions, and if he will read my letter again he may find that my object was not in favor of combines or trusts as generally understood. He will also perceive that the principles laid down would not favor one district more than another. He will see, too, that I raise no objection to the invasion of markets where the demand cannot be met by local supplies, neither do I object to the customer choosing his own market. I did not question the legal right of the down-town brickmaker to dump his brick in West Philadelphia, but his moral right is still questionable, because the local yards, so far, have been easily able to meet the demand.

Down-Towner's sense of legal right appears sharp enough, but I am not so sure about his sense of moral right when he justifies his invasion of an overcrowded market by saying, prac-

tically: "You invaded my market away back in the eighties, when we had a boom and could not fill our orders. I did not object to you then." Very true, my friend; there was no talk then of invading, nor any occasion for it; and, let me add, there ought not to be now, nor would there be, only for that unmanly competition which you are pleased to designate "rot." You do not suppose, I feel quite sure, that an invasion into your market would justify you in retaliating; yet such appears to be your plea all through your letter.

Of course, when everybody is overloaded with orders, no manufacturer complains of fierce competition nor invading the territory of another. The fact is that such conditions entirely reverse the location of the strife and competition then alights on the shoulders of the buyer and consumer, but duly returns to the manufacturer when the reaction or next dull season sets in. I presume my down-town brother just glories in the rush and riot of a big boom, and is hoping for a return of those glorious old excesses in which all come out winners apparently.

My guessing was not far wrong, but there appears to have been more than one invader, for I learn the bricks I saw hauled in are not yet paid for, nor any such price charged for them as that named in the "Hoop la" paragraph. Clearly my Hoop la friend's firm is not the one I allude to.

I observe there is now another down towner hauling and dumping his bricks here, making the third. I congratulate my brother's firm in having so good a customer and would remind him that there is all the difference in the world between a customer seeking a manufacturer and the manufacturer seeking the customer. My friend knows this quite as well as I do; more especially is this pronounced when the customer so promptly pays his bills. I heartily indorse the last sentence of my brother's letter; there is nothing unmanly in closing a deal that comes along your way when it comes clean and straight. As yet I see no reason to withdraw any of my strictures on the means used to capture foreign markets, nor of the unmanliness shown in invading an already crowded market. Recent developments only go to strengthen the position I have taken on the subject.

While my brother considers "all this talk about fierce and unmanly competition" "rot" he at once admits "it is very severe in all quarters and all businesses." Then he asks, "Who can you blame for it?" and "Where can you begin to pick out the unmanly fellow?" Now, my dear friend, we have only to do a little self-examination to find out who is the unmanly fellow and who is to blame; this is the straightest way to the root of the matter. Next let us closely examine competition, as we meet with it in business, and what do we find it to be? A monster of the polypus species, drawing everything to itself, whose vital principle is avarice and envy. The more avarice and envy abounds the stronger and keener is competition.

I have never met a man who would not object to being reputed avaricious and envious; yet how few of us can reasonably object to such a reputation? If, then, such a character is so repulsive to us all let us try a little reform. A friendly, brotherly feeling and disposition is just the opposite of avarice and envy, and the spirit of helping and co-operating with each other seems to me by far the best weapon to be used against the destructive shafts of competition and trusts or combines. These trusts or combines have, however, the same object in view, viz., to limit and weaken competition, but with this difference in results—a trust concentrates wealth or crowds it into one center, while true co-operation disperses it from center to circumference in every direction. What is the object of the Barber sewer-pipe trust, the wire trust and all other trusts but the centralization of capital, profits, property and everything in sight. It is only a matter of time when the grab will be made at the brick and tile yards—in fact, the whole clay industry; and what does this eventually mean? A greater contraction of wealth and its irresistible corollary, the greater distribution of poverty.

The side of politics my friend follows is of no consequence to me, but it would be some small comfort to know whether he is still hoping, which he says is "the only way," or whether he has "quit hoping" and going ahead and leaving his brethren behind, as he informs us in the next line or two; then he immediately reverts to his hoping again—rather conflicting. However, let me ask my brother if he has any sympathy with severe competition and the unmanly tactics by which it is supported, and if so to state the grounds on which his choice is based, for to my mind it seems clear that co-operation and sympathies of interest in all business affairs and the ostracising of smarty who exercises his talent at the expense of a brother in the business, trying to induce the co-operation of the operative builders, etc., is the surest and safest way to cripple the severity of competition. What is the object of our conventions? Is it not to help each other by a diffusion of knowledge pertaining to improved methods in business and manufactures? Is it not for mutual aid and to foster a brotherly feeling toward each

other? In short, is it not for mutual co-operation? My down-town brother surely has no objections to raise on this point. If he read my letter with ordinary care he would perceive that my strictures were not aimed solely at that poor down-town firm of brickmakers, but chiefly at some defestable business methods pursued by firms not in the clay business at all, and that my voice, or pen, was raised to deter, if possible, such methods entering into the clay business.

HYDRO-CARBON.

Continuous Kilns Their Salvation.

Editor Clay-Worker:

Enclosed is a little Christmas offering—\$2 for the Clay-Worker for '98.

It is pretty hard to write a cheerful letter about the brick business when the prospects for it are at the best rather gloomy, but I hope some day in the near future that the brickmakers around San Francisco (only eight in number) will come to the conclusion that they owe something to the stockholders and themselves, as well as to the dear people who buy brick.

Five years ago the brickmakers formed a Brickmakers' Protective Association, but, after working together in a sort of a half-and-half harmony for three years, they "busted" the thing, or at least the price of brick, and it has been a losing game ever since—hard brick selling at \$5 per thousand, when the poorest kind of soft coal screening costs \$5 per ton, and other expenses outside of labor in the same proportion. This is not a soft snap, and if they did not burn their brick (size, $8\frac{1}{4} \times 4 \times 2\frac{1}{2}$ 19-32, burned,) in the continuous kilns and save from 70 to 75 per cent. of the fuel bill they formerly had when we burned our brick in field kilns, they would find their profit on the wrong side of the ledger.

Our great trouble here is that the capacity of the yards is so much greater than the demand—at least double. San Francisco, San Jose, Stockton, Sacramento and the whole country within a radius of 75 to 125 miles around San Francisco use only about 60,000,000 per annum, and the prospect is not good for a greater demand for some years to come.

I am glad to see in the Clay-Worker that some of the brickmakers back East are learning to burn brick in the continuous kilns. Here all brick, repressed and stock, as well as common, are burned in these kilns, and I have never seen one of these kilns yet that would not only burn good brick with only ordinary management, but turn out 98 per cent. hard, and with less than half of 1 per cent. loss on an average for a whole year, as we do. This requires some knowledge and close attention on the part of the burners.

San Jose, Cal., Dec. 3, 1897.

HOPEON.

Gaseous Fuel In Kilns, Etc.

Editor Clay-Worker:

The excellent articles now being written for the Clay-Worker by Americus are being carefully read, criticised and enjoyed by myself, and no doubt many other readers of this magazine, and while accepting the bulk as good, wholesome reading, I must object to some portions of his paper in the December issue pertaining to gaseous fuel. I think I have had to take issue with other writers to the Clay-Worker on the same subject. If my memory serves me right, Brother Carson made the same or a similar assertion some three or four years ago, when he was experimenting with producer gas for brick burning. I cannot conceive what ground there is for the assertion that "The combustion gases from a gas kiln must not be used for watersmoking," or that a kiln must be raised to a dark red by direct firing, or otherwise, before turning on the gas. I never found such restrictions necessary, neither in kiln nor furnace; watersmoking presented no difficulties to my gas-firing experiments; all that was necessary was to be sure and have good gas in the producers and have an excess of air for burning it just inside the kiln—I may here say that it was cold air, too. When gas will burn clearly and steadily at the plug-hole on top of the producer, it may be relied on at the burner in the kiln, with either hot or cold air. I must also take exception to the statement that it requires higher fuel consumption; at any rate, that is not my experience, but the contrary; not only a lower grade of fuel may be used, but a less quantity, if the producer is kept in good trim and the air supply nicely proportioned and delivered to the burner in a divided state; in short, if you would derive the full benefit of producer gas, it must be well made and properly burnt. This holds good whether you use regenerative chambers or not. If, however, regenerative chambers are used, the advantage of gas over direct coal firing is from 25 to 75 per cent.

To me, the proposition of heating the air by drawing or forcing it through a cooling kiln appears fallacious, not only from the point of injuring the contents of the kiln, but from the small

amount of heat to be derived from it. I have never seen it tried, but I venture the assertion that if all the air necessary to support the fires of a burning kiln was forced through a kiln just burnt, that the cooling would be completed inside of twelve hours. Now, if it is necessary to have a constant supply of hot air for gas-burning, it is evident we cannot rely upon the cooling kiln for it, for it must also be obvious that the air supply is diminishing in temperature directly with the cooling kiln, and therefore will in a short time be so low as to be practically valueless. All who have had experience with regenerative furnaces know that it is necessary to reverse the currents every fifteen or twenty minutes to keep the regenerative chambers up to an efficient heat; that is, these chambers—which are filled with fire brick checker-work—are alternately cooled and heated up again every fifteen or twenty minutes. A better comparison, however, with the cooling kiln is the hot blast stove of the blast furnace; this is very much like a round kiln from twenty to twenty-four feet inside diameter and about sixty or seventy feet high, and is filled with checker-work same as the regenerative chamber mentioned above—in fact, that is really what it is. Now, these regenerative hot blast stoves that only heat the air 1,000 to 1,200 degrees F., have to be reversed every two hours; this was the practice ten or twelve years ago.

The points, however, that I wish to enforce are that producer gas can be efficiently burnt in the kilns or under steam boilers with cold air, and less fuel will be required to do the same work. These assertions are not based on theoretical considerations alone, but are supported by practical experience. What I have said concerning the heat from a cooling kiln is not altogether derived from practical experience, and if any practical brother can show me clearly how one-fourth of that heat can be utilized, he will confer a favor on many readers of the Clay-Worker and myself.

W. WAPLINGTON.

Annual Meeting of The National Association of Stove-Lining Fire Brickmakers.

Editor Clay-Worker:

The annual meeting of the stove-lining brickmakers was held on Wednesday and Thursday, December 15th and 16th, at the Broadway Central Hotel, New York City. There was a large attendance of members. Nearly all of the factories were represented. The Pennsylvania and the New York State sections were early in their attendance, but owing to an unusually severe storm and dense fog, the New England section, who generally come by the popular Fall River line of steamers, were delayed, and did not arrive until 3:45 p. m., so that the general business could not be proceeded with at the appointed hour.

H. S. Horton, of Peekskill, N. Y., the President, and Benjamin F. Fox, of Reading, Pa., Vice-President, being present, called the meeting to order at noon and suggested that as the Secretary, B. C. Pierce, and the Treasurer, John Williams, were among the delayed passengers, who had sent a telegram stating that they could not arrive before 3 p. m., that they should adjourn to meet again at 4 p. m. This suggestion was acted upon.

As the great stores of New York were decked out in their holiday displays, and were crowded with shoppers, several of the brickmakers set out to see the holiday sights, and incidentally to spend some of the profits derived from the past season's labor in clayworking, and probably the adjournment helped to gain them a heartier welcome upon their return home. One party, under the escort of C. A. Bloomfield, made a visit to the stores of Tiffany & Co., at Union Square, to see the exhibit of choice specimens of various ceramic products from Russia, Germany, France, Great Britain, Italy, Asia and Africa, as well as from our own country. The exhibit of Delft ware, in its charming shades of blue upon white, attracted the most attention. There were some large pictures painted upon groups of 6x6 tiles that were exceeding fine, especially one copied from a masterpiece of the celebrated blacksmith-painter, Quintin Matsys, entitled "The Burgomasters." It was upon forty tiles, and the painting was so carefully and artistically executed that the joints were almost invisible. It was a pleasure to hear the wondering expressions of the brickmakers as they went from one wonderfully beautiful specimen of clay work and pottery decoration to another, and all of us came away with a more exalted idea of the scope of the clayworker's art.

At 4 o'clock, the belated members having arrived, the regular order of business was taken up, and the organization was completed by the election of officers for the ensuing year. The officers for 1898 are as follows:

President—Benjamin F. Fox, Reading, Pa.

Vice-President—Wilson L. Condon, North East, Pa.

Treasurer—John Williams, Taunton, re-elected.

Secretary—B. C. Pierce, Taunton, re-elected.

Among the reports presented to the Association none was more welcome than that of the Treasurer, which again showed a favorable balance, including an item exceeding \$9, being interest upon the balance in charge of the Treasurer.

On Thursday, at 9 o'clock sharp, the members again came to order and completed the business of the year. The reports concerning the past season's trade and prices were generally satisfactory, even above the average, and all the members were convinced by another year's experience that the good-will and help derived from these assemblages were of great value to the trade as a whole, and to each member individually. Once again it was affirmed by past President Harvey S. McLeod, of Troy: "It is not, What can the Association do for me? but What can I do for the Association? that makes the success." This is the keynote which dominates the harmony and maintains the accord of the stove-lining fire brickmakers.

On Wednesday evening the visiting members were entertained at a theater party, and on Thursday the annual banquet of the Association, with its season of cheerful reminiscence and hopeful prophecy, brought this most enjoyable gathering to its close. The following gentlemen were present at the banquet and helped to make the function a pleasant one, the President of the Association presiding: Benjamin F. Fox, President, Reading, Pa.; Wilson L. Condon, Vice-President, North East, Pa.; John Williams, Treasurer, and B. C. Pierce, Secretary, Taunton, Mass.; H. S. Horton, Peekskill, N. Y.; Harvey S. McLeod, Troy, N. Y.; Gideon Francis, Dighton, Mass.; Joseph Williams, Taunton, Mass.; C. S. Helmer, Buffalo, N. Y.; Mr. Hyser, Philadelphia, Pa.; Walter Parker, Bradbury French and Arthur Lincoln, Taunton, Mass.; Wilmer J. Falls, North East, Pa.; H. A. Perkins, Brooklyn, N. Y.; William Latshaw, Royersford, Pa.; C. A. Bloomfield, Metuchen, N. J.; James Taylor, Port Monmouth, N. J.

The subject of this Association joining the N. B. M. A. was again referred to, and it is very probable that several of the members will attend the coming Convention of the N. B. M. A. at Pittsburg in February.

JAMES TAYLOR.

CALENDARS FOR 1898.

As usual at this time of year, our sanctum walls are decorated with a number of very pretty calendars. Among them is one from J. C. Steele & Sons, Statesville, N. C., showing a lovely little maiden charmingly bedecked with posies and surrounded by a group of "New South" brick machines, cutting tables, clay cars, etc.

Another from the Frost Manufacturing Company, Galesburg, Ill., shows a maiden older grown and less bedecked, but happy in the anticipated possession of a beautiful bouquet which a group of Galesburg gentlemen are about to present to her. The same firm favored us with a smaller calendar, the striking feature of which is a group of lads clad alone in their native modesty. From his calendars, we judge that Andy Harrington is a devotee of the nude in art.

Another and an exceptionally handsome contribution to our yearly collection bears the imprint of F. W. Silkman, importer and jobber of clays and chemicals, New York City.

HOLIDAY REMEMBRANCES.

Among the holiday offerings that have reached the editorial desk, is a substantial pocket card case, bearing the imprint and kindly wishes of the Wellington (Ohio) Machine Company. It is a useful gift, one that reminds the recipient that Wellington is a good place to buy Monarch and Quaker brick machines and other brickyard supplies.

A similar token comes with the compliments of E. W. Bach, the well-known Secretary of the Standard Fire Brick Company, Ottawa, Ill. These little remembrances are very pleasant to take, and make the "daily grind" more endurable than it otherwise would be.

We are indebted to the Perth Amboy Terra Cotta Company for two very pretty tokens of their esteem in the form of a handsome paper-weight and a grotesque penholder. The latter represents a disciple of Joss seated on a pedestal, his outstretched arms forming a ready receptacle for the editorial pen. They are both excellent examples of glazed terra cotta, and are much appreciated.

From Maine to California is a wide territory, but the Potts Brick Machine and Disintegrator seems to be at home in every section of it, as the reader who turns to page 78 will observe.

The Ohio Ceramic Engineering Company, Cleveland, ask special attention to the fact that their repress, which is illustrated on page 9, is not a complicated machine, as it seems some of our readers have been led to believe.

The Chicago Brick Machine Company, having outgrown their former quarters, have taken three additional rooms in the

same building, which affords them much better facilities for handling their business, which is growing in a very satisfactory manner. They extend a cordial invitation to all clayworkers visiting the "Windy City" to call and see how cozy they are in their new quarters.

WATER PROOF BRICK.

ONE OF THE BEST KNOWN brickmaking concerns of western Pennsylvania is the Welch, Gloninger Company.

The firm was organized about ten years ago and succeeded to the business of James H. Welch & Bro., who started ten years previous to that, or in 1878. James H. Welch and John H. Gloninger constitute the present firm. They have two plants, one at Monaca and the other at Vanport, Pa. Their specialties are "W" fire brick and "Water-proof" front brick. The "W" brand was adopted by them about fifteen years ago and they have made it so popular that there are now about ten imitations of it on the market. Five years ago they adopted the name "Impervious" for their front brick and it also has been copied by many others, so they have changed the style to

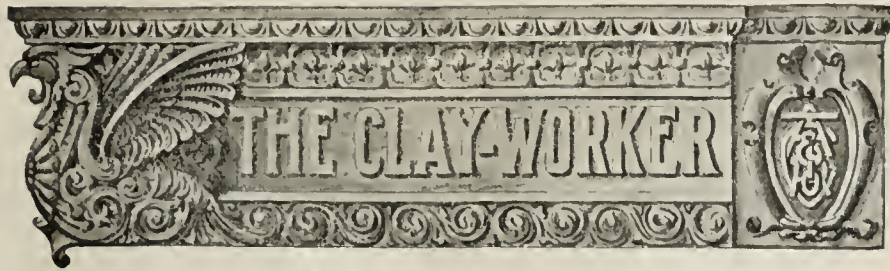


A Water Proof Brick.

"Water-proof" and hope to make it a standard from which other brick will be estimated.

Among the buildings for which they have furnished brick are Madison Square Garden, New York; Fire Department Building, Boston; High School Building, Buffalo; Zoological Garden, Pittsburg, and the Jenkins Building, Pittsburg, which is probably the finest wholesale grocery warehouse in the country. Their "Water-proof" front brick are made by the stiff-mud process and are repressed, while the "W" fire brick are molded soft-mud brick. The combined capacity of the two plants, both of which are situated about twenty-five miles from Pittsburg, is 35,000 a day.

Their city office is in the Carnegie Building and is in charge of Mr. J. H. Cunningham, who is himself a "water-proof" brick. At least, we have never known him to take water, and his neighbor, James F. Bowes, the resident representative of the Hydraulic Press Brick Company, whose office is in the same building, assured us that he never did either. We know they are both hustlers and as clever as clever can be—as any visiting brickmaker who may call on them will find.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

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JANUARY, 1898.

No 1.

CURRENT COMMENT.

We are intentionally a few days late with this issue. A good thing is worth waiting for, so we know our readers will not complain. We will be equally late with the February issue, which will contain a full report of the National Convention, and, by the same token, will be well worth waiting for.

* * *

"Made more brick last year than this, but we sold for better prices this year, so we have made more money and are consequently happier." So spake a member of the Illinois Convention. There is a deep significance in this that we wish might sink deep into the heart and make an indelible impression on the mind of every reader.

* * *

Prosperity is with us. For corroborative evidence just look through our advertising pages, remembering that this is not a BREAK issue. The large number of new ads. have come to the Clay-Worker naturally, and not as the result of special rates, exaggerated statements and never-ceasing solicitation, neither of which is necessary in our case. Machine manufacturers know from experience the trade-getting qualities of the Clay-Worker, and when business prospects justify extra effort, they turn to its pages as naturally as a duck takes to water. Prosperity is with us.

* * *

In a recent letter Davis Brown, the General Manager of the Leader Manufacturing Company, who is entitled to much of the credit for the success of the Decatur Convention, writes:

"Our people have been benefited greatly by the Convention, enjoyed it fully as much as the visitors, and are under obligations to yourself and the other old-timers for making it a success. I am unable to see why the attendance cannot be increased. Our people will attend next year—a thing they have not done in eight or ten years; so you see there was some good in coming here and waking us up."

It is gratifying to know that both the entertainers, as well

as the entertained, were benefited, and that Decatur will have a good working delegation at the next Convention.

PASTE IT IN YOUR HAT.

Mayor Taylor (may his tribe increase!) in his welcome address said: "Decatur was among the first cities to commence the improvement of its streets by paving them with brick. Make your foundation right, cover it with good brick, and in my opinion it is as good if not better than any other pavement on earth to-day." The sentiment was applauded, and well it might be. Coming, as it does, from the official head of a city that has used paving brick for more than a decade, it deserves to be inscribed on tablets of clay "in due and ancient form" and then placed before the heads of municipalities throughout the country. Paving brick manufacturers should do with it as they do with our little calendars—paste it in their hats.

A NEW DEPARTURE.

The programme of the Pittsburg Convention presents a new feature—an executive session, during which matters which are of vital importance to the entire brickmaking craft will be considered, though in some instances these interests may be local in character. All reporters will be excluded, and no published report will be made of the discussion, so that a full, free and unrestrained expression may be had. We anticipate that much good may come from this procedure. It will be free from any personal trend or tendency, and only such matters as are of importance to the Association and the interests represented will be considered.

TURNING OVER A NEW LEAF.

It may be a little late in the month to turn over the traditional one, but some kind of leaves can be turned over most any day. The leaf that we have in mind relates to prices. Brickmakers make brick enough, but they do not make money enough, and this is largely their own fault. The people will buy as cheaply as they can. This is always true. The brickmakers can get good prices if they like. Not for the asking, perhaps, but if they will command their forces as others do, the evils of unrestrained competition may be lessened greatly. Other business industries have worked around all of these difficulties. It is not because the brickmakers are situated any differently from the rest of the world, nor do we say that the brickmakers have less brains than others. We do say they haven't used them in the right direction. Most of the energy and thought of the brickmakers of this country has gone into technical brickmaking. If one is disposed to question this, let him look at the literature of brickmaking. Edison says that it takes as much brains to make money out of a product as it does to make the thing itself. We are not sure but it might be well for our conventions to take up questions of business policy in the same serious spirit in which they have heretofore considered the operative features of the business. In the meantime let us turn over a new leaf and ask for better prices. That is the way to get them.

HOW TO SANDBAG A COMPETITOR.

Taking the country over, last year's output of brick was large, but the consumer got all the benefit. The brick manufacturer became demoralized early in '97. He made up his mind that he would have to sell his brick cheaply, so he started in and he kept it up the whole year through. Wouldn't it be a good plan to start the year 1898 with the idea that you are going to get better prices?—and we wish to state that this spirit, if followed, will have a good deal to do with the result. If brickmakers at the beginning of 1897 could have known of the number of brick which they were to sell during the year, they would have asked better prices. In lieu of knowledge which we cannot have, we should try a little sand. A friend of ours works a very good scheme along that line. When he goes out to make

a sale he carries a small sack of sand with him, and when he feels that the other fellow is going to break him down he sticks his hand down in his side pocket, grips his sack of sand and takes fresh courage. Let every brickmaker in the country, in lieu of a lucky stone, put a little sack of sand in his pocket, and see if he cannot get better prices during the year '98 through the principle which it represents. When you get a little shaky in the fear that your neighbors are going to cut prices, put your hand in your pocket and take a fresh grip. Hold up your prices. Maybe your competitor will be doing the same thing. Let the talisman for 1898 be a sack of sand. It does not need to be large. Just a little sand.

LOOK AHEAD.

In the nature of things the brickmaking industry is progressive. The practical and artistic value of brick as a building and decorative material must make it a dominant quantity in its relation to other material used for the same general purpose. The engineering, the building, the artistic value of brick is such that the field for its usefulness must necessarily expand. The insurance value alone of brick is sufficient to proclaim it the ideal building material. The plastic quality of clay, which renders the formations readily and cheaply artistic, makes it a favorite material with those artistically inclined. The chemical knowledge with respect to clay has, among other things, added to the color value of this material. All progress comes from inherent qualities. The natural advantages of this material proclaim its future development and the commercial advantage which must necessarily come to those who keep up their equipment and who keep in touch with the movements of the clay-working world.

THE SPIRIT OF DECATUR.

The spirit of Decatur is the spirit of enterprise. Mayor Taylor believes in Decatur and hustles for it along practical lines. There is no town too small and certainly none too large to profit by this example. Decatur, like other live towns, has been indulging in a good deal of physical improvement. But, unlike many towns, so far as possible they have used local material. Think what this means. It does not mean sending a whole lot of money out of town as fast as material is shipped into town. That is what it means when wooden blocks, asphalt and even brick from outside points come into a town. When a city sends a large portion of its money outside its own borders for the material for local improvements, there is a limit to the amount of work which it can do. But where the expenditures are confined to and the money retained within the borders of the community, then, within reasonable bounds, there is no limit. It is a wheel within a wheel. Measurably, it is co-operation. Take Decatur as an example: The man who makes the brick is paid; he, in turn, pays his workmen; they, in turn, the grocer and merchant; the merchant, the banker; each in his turn getting a small part of the gross expenditure, and each in his turn being placed in a position where he can more easily pay for the improvement. This is a good principle; Decatur is working it for all it is worth, and other cities might profit by a similar course.

TAKE A FRESH START.

It is a good time, just now, to take a new start. He has not done his best who has not learned something worth remembering in the experiences of the past year. Some things undertaken may not have resulted as you expected. Such an experience is not an unmitigated evil if we determine to profit by it and avoid a like experience in the future. It is a good thing to balance the books at least once a year, and this period of relaxation is a suitable time—and this does not refer to the mere money side of life only. We could wish that every one of our readers might find occasion to place a handsome figure on the credit side of the balance sheet, but it would be a rare event if

it should be so. Such is not life in brickmaking, or in any other vocation, neither is it true that with any one person the entry is uniformly on this side or that. A concatenation of events, wholly beyond one's control, may have been linked together, resulting in pecuniary disaster, and the like may never occur again with the same individual, and is not likely to if, with heroic grit, he takes a fresh start and practices to avoid the undesirable happenings of the past. On the other hand, the man whose credit side of the balance sheet is largest may be on the other side of the ledger next year, possibly through his own unwisdom, but probably by the returning tide which so often sweeps out the freight it previously bore inward.

But the success of the year is not to be measured alone by the dollars on the debit or credit side of the balance sheet. Many a man finds a handsome balance on the credit side which has been bought at too great an expense. Whoever has been such a slave to his business as to have taken no time for mental, moral, social or domestic pleasures has paid too dear for his dollars. Have children been taken out of school or kept out, has wife been denied suitable rest, suitable books and suitable comforts so that the bank account might grow? That bank account has cost too much at such a price. Turn over a new leaf! Live with your family and for them. The hours of childhood can never be recalled. Better a meager bank account than uncultivated brains or a dispirited wife, not to mention your own dull and monotonous life. Work hard; that is right; but play hard, laugh hard, and be happy. The very best thing you can do preparatory to the coming summer's work would be to start for Europe from the tenth to the fourteenth of next month, taking in Pittsburg enroute. If you can possibly take in Indianapolis, so much the better. Stop off and visit the Clay-Worker, and from our office windows look upon the greatest Soldiers' monument in the world, from the top of which you can look over the central city of the United States; then plan to spend at least four days at Pittsburg and attend the National Convention of Brick Manufacturers. Ten chances to one you will be so invigorated and rejuvenated that you will not have to go to Europe at all, but will return home a happier and wiser man than ever before. Try it once. Take a fresh start. Make yourself happy by making others happy.

THE INFLUENCE OF ORGANIZATION.

The Convention at Decatur, the proceedings of which we publish in this month's Clay-Worker, was one of the most successful State Conventions ever held. The attendance was large, the spirit was good, the papers and discussions which it brought out will make a valuable addition to the literature of clay-working. The broad, helpful influence of a Convention, State or National, is now unquestioned. The closer the spirit of organization can come to the individual the better for all concerned. A State meeting is but an intermediate step between a national and a local organization. Not only should every State have its own organization, but every community in which there are two or three yards should have a local organization. There is enough demand for brick at all times to afford a respectable income to all brickmakers and to all manufacturers of clay products. National, State and local organizations should strive to make fair prices possible. We know pretty well how to make good brick. Now what we most need to know is how to sell them at a profit. The same quality of brains which has developed and recorded our technical knowledge should place us in a position to make money out of our product.

THE IOWA CONVENTION.

As we go to press a letter comes from C. L. Smith, the worthy ex-Secretary of the Iowa Brick and Tile Association, advising us that the eighteenth annual meeting of that Association, which was held at Des Moines the 12th and 13th, was one of the best held for a number of years. While the enrollment of members showed but thirty-five, the attendance was

really nearly double that number. The papers were splendid and the discussions spicy, practical and to the point. The election of officers resulted as follows: C. J. Holman, Sergeant's Bluff, President; W. W. Lewis, Williamsburg, Vice-President; Robert Goodwin, Jr., Redfield, Secretary; F. A. Stevenson, Webster City, Treasurer. The time and place for holding the next Convention was left with the Executive Committee. Invitations were received from Sioux City, Burlington and Iowa Falls. The next meeting will probably be held in one of these cities.

TRADE LITERATURE.

WE ARE INDEBTED to the American Clayworking Machinery Company, Bucyrus, Ohio, for a copy of their 1898 catalogue, which is a large and handsome book of nearly 200 pages. The cover is particularly bright and attractive. The design is artistic and is worked in red, white and blue and gold, Old Glory being the central figure. Between the covers is a great deal of valuable information for all clayworkers. Their extensive line of brick, tile and pottery machinery, which includes almost every mechanical device known to the trade, is fully described and illustrated. It is a costly publication, but we presume a copy will be mailed to any of our readers on application.

A BRICK-RED COVERED BOOK with the title "Clayworking Machinery, Horton Manufacturing Company, Painesville, Ohio," richly embossed in gold, has been received. Turning its leaves, we find it contains well-executed illustrations of the Hercules horizontal stock brick machine, their latest production, and other tempered-clay machines, which they make for both steam and horse power, and a full line of brick and tile-yard supplies, including dump cars, revolving turntables, trucks, barrows, molds, etc., etc. A copy can be had for the asking.

WE HAVE RECEIVED a catalogue from the Eastern Machinery Company which is devoted exclusively to their improved Friction Clutches, Clutch Pulleys and Friction Cut-off Couplings, all of which are peculiarly adapted to brick and tile machinery. Write for a copy if in the market for anything of the sort.

"THE PERFECT CLAY SCREEN" is the title of a little pamphlet received from Elder & Dunlap, Bloomington, Ill., which gives a brief treatise on screening clay and then tells how that work can be done most satisfactorily by the use of their screen, which is fully described and illustrated. They will gladly mail a copy to any of our readers desiring it.

F. E. SWIFT, Washington, Iowa, is sending out a neat little leaflet, telling of the merits of his patent furnace for brick and tile kilns. If you want to learn how to reduce your fuel bills, write him.

NEW ADVERTISEMENTS.

	Page.
Chambers Bros. Co., Brick Machinery, etc.....	1, 55
Chisholm, Boyd & White, Dry Press Machinery.....	4, 5
Williams P. C. & P. Co., Clay Crushers and Pulverizers.....	8
The Ohio Ceramic Engineering Co., Brick Presses.....	9
Chandler & Taylor, Engines.....	54
The Wellington Machine Co., Brick Machinery.....	54c
The A. Bonnot Mfg. Co., Clayworking Machinery.....	54e
American Clayworking Machinery Co., Clayworking Machinery.....	54g, 74, 81
Central Machine Works, Brick Machinery.....	54h
Baltimore & Ohio R. R. Co., Reduced Rates to Convention..	54k
C. & A. Potts & Co., Brickyard Supplies.....	54j, 68, 78
F. Lehman & Co., Brick Kiln.....	54l
Chicago Brick Machinery Co., Clayworking Machinery.....	54n
J. W. Carson, Brick Kiln.....	55
S. Geysbeek, Chemist.....	56
James Hensley, Brickyard Supplies.....	56
Carl F. Kaul, Brick Kiln.....	56
Thomas Carlin's Sons, Dry Pans, etc.....	66
Harvey Haigh, Brick Kiln.....	66
Huetteman & Kramer, Brick Machinery.....	68
Henry Martin Brick Mach. Mfg. Co., Brickyard Supplies....	69
Horton Mfg. Co., Brick Machinery.....	73
Fate-Gunsaulus Co., Brick and Tile Machinery.....	75
E. M. Freese & Co., Brick and Tile Machinery.....	80
Eastern Machinery Co., Brick Machinery.....	82
Wolff Dryer Co., Brick Dryer.....	84
American Blower Co., Brick Dryer.....	84

TABLE OF CONTENTS.

The Heart of Pittsburg	11	The Four-Year-Old Sends Greetings	45
Button-Hole Talks	19	Chicago to Pittsburg.....	45
A Valuable Point.....	20	Obituary—Death of James E. Dingee	46
Modern American Front Brick.	21	It Is All Sufficient.....	46
Old China of France and England, Bearing American Design	22	The Latch-String Hangs Out...	47
THE ILLINOIS ASSOCIATION.		A Good Combination.....	47
The First Clayworkers' Convention for '98 A Decided Success.	24	Better Times In The South....	47
Report of Members.....	24	Fire at Collum's Brickyard Philadelphia	54f
SECOND SESSION.		Calendars For 1898.....	50
Mayor Taylor's Welcome.....	27	Holiday Remembrances.....	50
President's Annual Address..	27	Water Proof Brick.....	50
Burned Clay For Roads.....	28	A Well-Known Machine Man Caned	54f
Tile Drainage as an Investment.....	30	CORRESPONDENCE:	
New and Old Brickmaking...	32	An Example Others Might Follow With Profit.....	48
The Tile Maker's Dream.....	34	The Home Markets Again.....	48
THIRD SESSION.		Continuous Kilns Their Salvation	49
How Can We Best Dull the Raw Edge of Competition?...	35	Gaseous Fuel In Kilns, Etc....	49
Advantage of Tile Drainage ..	36	Annual Meeting of The National Association of Stove-Lining Fire Brickmakers.....	49
Hollow Bloeks—Their Advantages	37	New York News.....	54b
The Advantage of Large Tile Drains	38	Among St. Louis Brickmakers.	54f
The Value and Advantages of Conventions.....	38	Pacific Coast News.....	54l
Tribulations of a Brickmaker	39	EDITORIAL:	
The Wear and Tear of Clay-working Machinery.....	40	Current Comment	51
After the Next Convention...	41	A New Departure.....	51
Report of Committee on Resolutions.....	42	Paste It In Your Hat.....	51
Election of Officers.....	42	Turning Over A New Leaf.....	51
The Banquet.....	43	How To Sandbag A Competitor.	51
The Trip to the Brickyards...	43	Look Ahead.....	52
In The Ante Room.....	43	The Spirit of Decatur.....	52
List of Members.....	43	Take A Fresh Start.....	52
Official Announcement.....	44	The Influence of Organization..	52
		The Iowa Convention.....	52
		Trade Literature.....	53
		Editorial Notes and Clippings..	54d

Index to Advertisements on Next Page.

BOOKS FOR BRICKMAKERS.

"CLAY GLAZES AND ENAMELS,"	Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

WANTED—A man for night burning who understands up and down draft kilns. Address THE GARDEN CITY CO., Farmingdale, L. I.

WANTED—Situation as superintendent or general manager of brick and tile plant. Thoroughly reliable and competent. Have not been idle for years. Know how to manage men, and make and burn all kinds of ware. Address AMERICAN, care Clay-Worker.

FOR SALE—All or part of two Penfield soft mud machines. Two Potts sanders, one four-roll crusher, with shafting, pulleys, etc., suitable to run the same. All in first-class condition. Immediate delivery can be made. Apply to MONTELO CLAY & BRICK CO., Reading, Pa.

WANTED—A situation as general manager or sales agent of a building brick manufactory. Thoroughly conversant with all the details of the trade, but especially the making and marketing of front or pressed brick. For several years connected with one of the most successful concerns in the U. S., to whom I can refer as to ability, integrity, etc. Address HUSTLER, care Clay-Worker.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
Simpson Brick Press Co	6	The American Clay-Working Machinery Co.....	54g, 74, 81
The Chisholm, Boyd & White Co.....	4, 5	The Fernholtz Brick Press Co..	7

Brick and Tile Machinery.

Anderson Foundry and Mach. Works.....	69	St. Louis Pulverizer Co	2
Baird and Son, H. C.....	62	Steele, J. C., & Son.....	64
Brewer, H. & Co	79	The A. Bonnot Co.....	54c
Carlin's Sons, Thomas	66	The Fate-Gunsaulus Co.....	75
Central Machine Works	54h	The Huetteman & Cramer Co..	68
Chambers Brothers Co	1, 55, 72,	The American Clay-Working Machinery Co.....	54g, 74, 81
Chicago Brick Machinery Co.....	45n	The Horton Mfg Co	73
Eagle Iron Works.....	58	The Eastern Machinery Co....	82
Freese, E. M. & Co	80	The Henry Martin Brick Mach. Mfg. Co	69
Frost Engine Co	76	The Leader Mfg. Co.....	72
Hensley, J. W.....	56	The Ohio Ceramic Engineering Co	9
Kells & Sons	62	The Wallace Mfg. Co.....	54m, 47l, 83
Means & Co., Jas.....	58	The Wellington Machine Co ..	54e
Madden & Co.....	63	Williams Patent Crusher and Pulverizer Co	8
Murray & Weleh	58	Wiles Co., A. M. & W. H	65
Newell Universal Mill Co	71	Woolley Foundry and Machine Works	77
Potts & Co., C. & A.....	54j, 68, 78		
Raymond & Co., C. W	54a		
Stedman's Machine Works.....	64		
Schoellhorn-Albrecht Mach. Co.	2		

Brick Kilns and Dryers.

Alsip, S. H	65	Pike, E. M.....	59
Carson, J. W.....	55	Phillips, S. G.....	62
Eudaly, W. A	67	Reppell, L. H	65
Haigh, H.....	66	Swift, F. E.....	60
Hundt & Co., F	59	The American Blower Co.....	84
Kaul, C. F.....	56	The Fernholtz Brick Press Co..	7
Lehmann & Co, F.....	54l	The Standard Dry Kiln Co.....	10
Morrison & Co., R. B	67	Wolff Dryer Co.....	84
		Yates, Alfred.....	58

Brick Yard Supplies.

Arnold, D. J. C.....	71	Phillips & McLaren	57
Coldewe & Co., G.....	60	The Atlas Bolt & Screw Co.....	70
Carnell, Geo.....	65	The Harrington & King Performing Co	3
Cox, Geo. S.....	59	The Henry Martin Brick Machine Mfg. Co	69
Caldwell & Son Co., H. W.....	61	The Horton Mfg. Co.....	73
Carmichael, T. W.....	60	The Pittsburg Mineral Screen Company.....	59
Elder & Dunlap.....	57	Wagoner, M. V. B.....	61
Marion Steam Shovel Co.....	70	Walworth Run Foundry Co....	480
Mey, F. H. C.....	59		
Mershon & Co., W. B.....	3		
Newton, A. H.....	61		

Miscellaneous.

Associated Trade & Industrial Press	60	Schools	63
Bennett & Sayer.....	57	Indiana, Decatur & Western ...	63
Baltimore & Ohio.....	54k	Illinois Central R. R	62
Big Four R. R.....	63	Lake Erie & Western.....	61
Cincinnati, Hamilton & Dayton R. R	63	Main Belting Co	60
Chandler & Taylor Co.....	54	Monon Route	61
Chesapeake & Ohio R. R.....	63	Osborne, W. R.....	59
Cotton Belt Route.....	60	Ropkey-Mason Engraving Co..	55
Dean Bros. Steam Pump Works	58	Tennille, A. F.....	60
Dover Fire Brick Co.....	61	The Jeffrey Manufacturing Co..	63
Evans & Howard	57	The Rockwood Mfg. Co	61
Gabriel & Sehall.....	58	The Sheldon Distillery Co	63
Geysbeek, S.....	56	Vandalia Line	62
International Correspondence		Westbrook & Wells.....	62
		Small Ads., Wanted, For Sale, etc.	

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

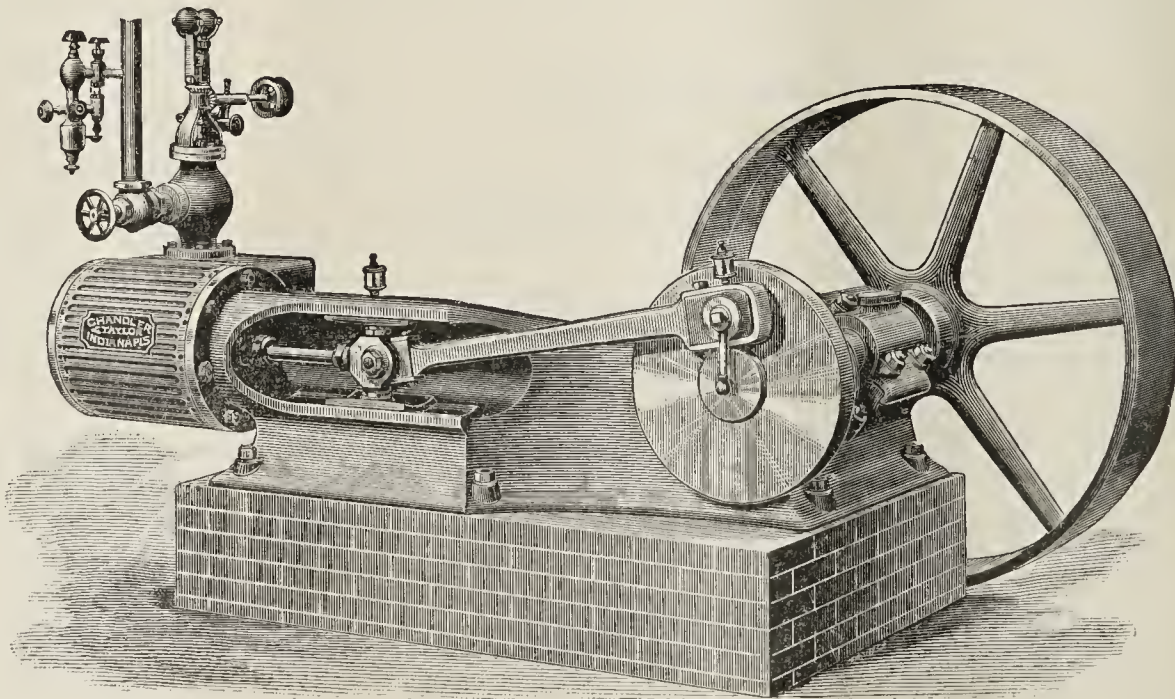
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ENGINES AND BOILERS

Suitable for Operating Clayworking Machinery.



We will be represented at the Pittsburg Convention by Wm. M. Taylor who will be pleased to extend the glad hand to the members of the N. B. M. A , among whom we already have a large number of friends and patrons and hope to increase the list.

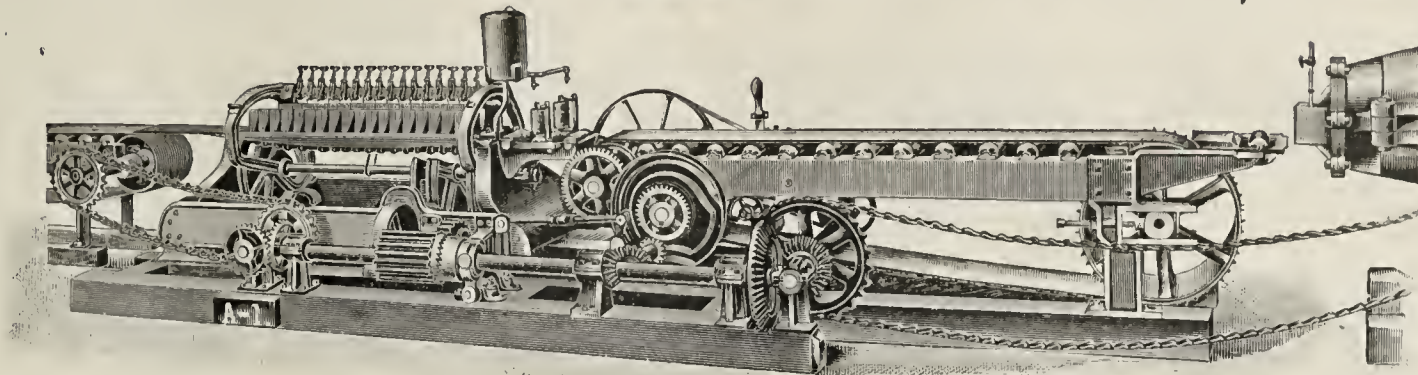


Manufactured by CHANDLER & TAYLOR CO.,

INDIANAPOLIS, IND.

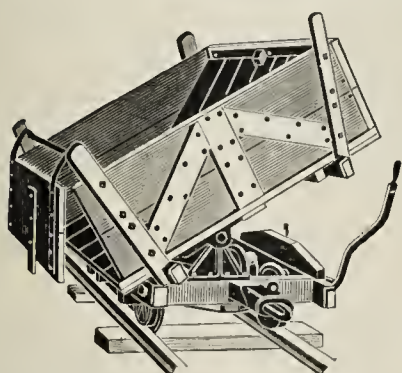
Send for Catalogue and Prices.

Yes Sir-ree! We Make 'em all, We do!

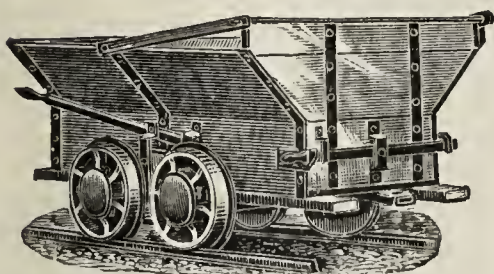


Automatic Side Cutting Table.

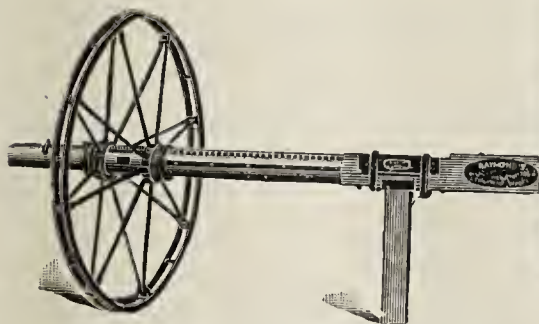
An' we make a whole lot more besides,



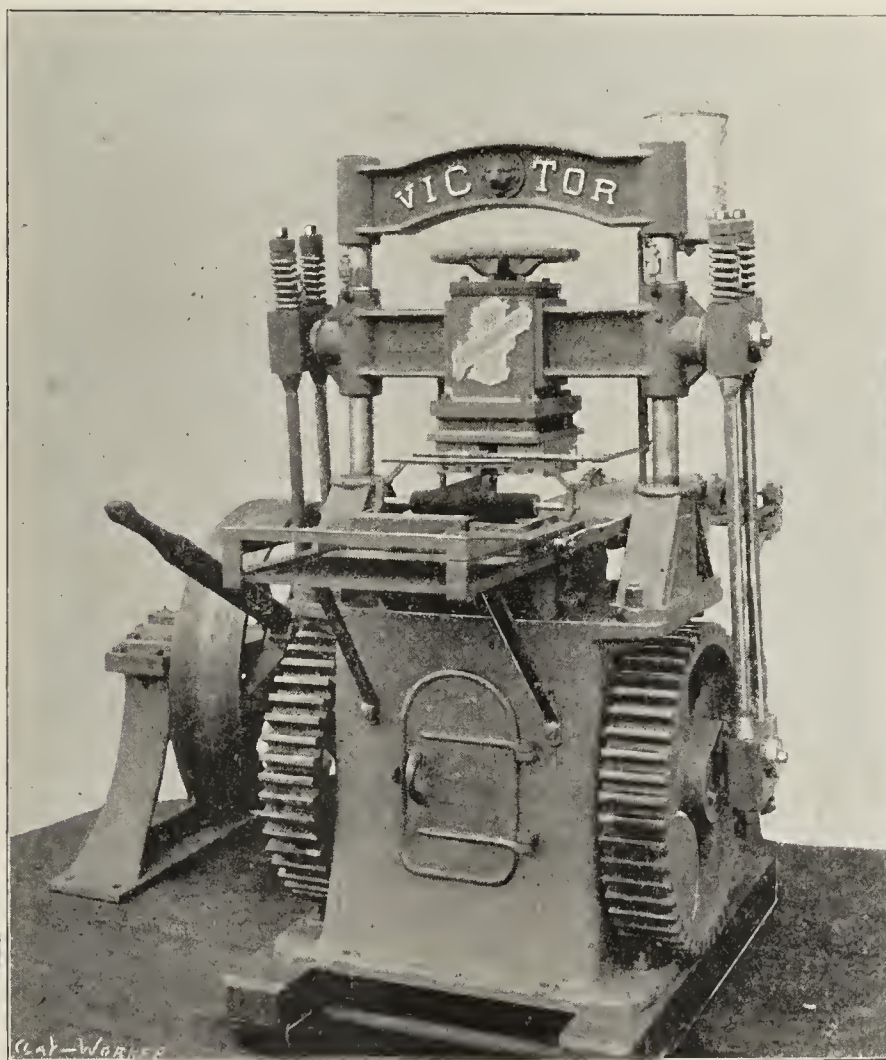
Automatic Dumping Car.



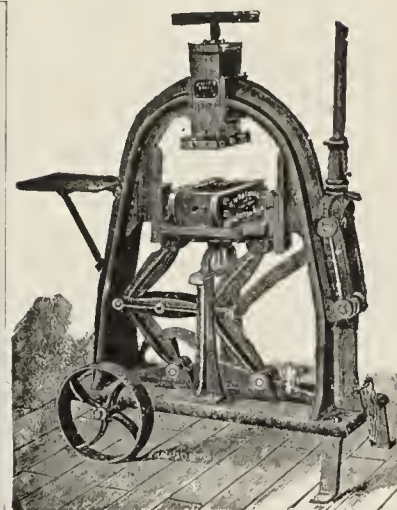
Bottom Dumping Car.



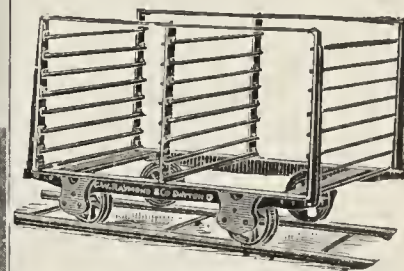
Wrought Iron Tempering Wheel.



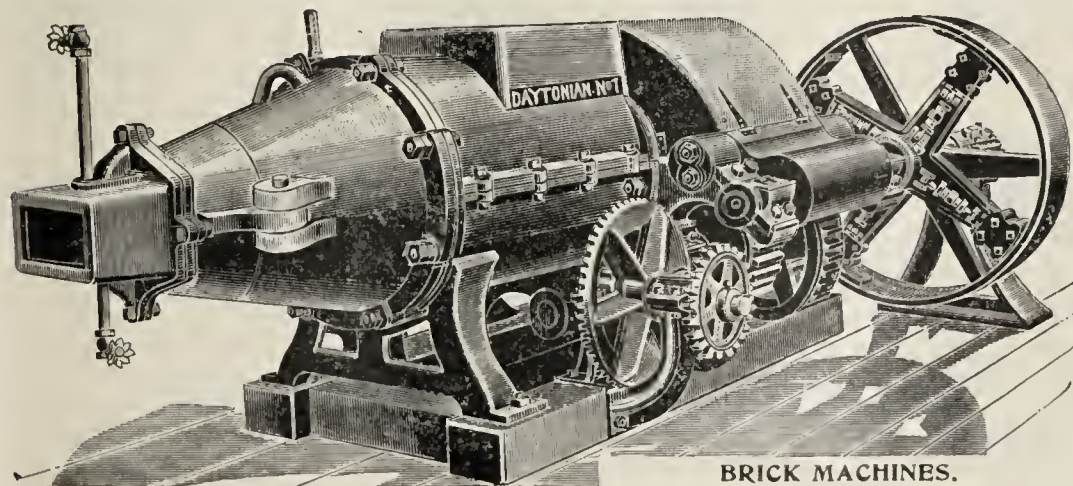
The Raymond "Victor" Repress.



Perfection Brick Press.



Dryer Cars.



BRICK MACHINES.

We Sell 'em too like hot cakes.

...

**C. W. Raymond
& Company,**

Dayton, Ohio.

Written for the CLAY-WORKER.

NEW YORK NEWS.



WHEN THIS NUMBER of the Clay-Worker reaches its readers the holidays will be numbered with the past. I hope that it was a merry Christmas to all, made so by the improved conditions of the trade, and especially in the brick industry. The tide-water manufacturers no doubt felt that they could say it was a merry Christmas to them when compared with the same date of a year ago, as regards the price of brick. Then many felt they could not afford to buy a very large turkey. This year his pocket contained more change, and he was merry because the last returns from his agent showed that brick was on the move upward and the commission man's instructions were not to ship but to hold back, as the market was bound to do better.

Sound advice; but what is a man to do when he has been, so to speak, eating husks for the past few years? He must send some to market, as he wants to feel that he is able once more to keep Christmas as of yore. If he waits for a further advance he may get left, as the season is getting late and the good weather may break and winter set in, and that one more cargo that he would like to ship so as to square up his little bills with the money from its sale will not reach market. With but few exceptions, it seems that no matter how hard pressed they may be for money, just so soon as there is any improvement in the trade, the surplus advance, I cannot say money, as they are expecting the continuation of better rates, they branch out at once. In the past Christmas has been the day in several cases to make presents of pianos and other costly articles, while some of the laborers were not paid.

It may be a happy New Year to the trade in this part of the States if (and that IF is the stumbling block) they will profit by past experience and so regulate the output that a steady price will rule. The claim is made that the amount of brick under the sheds is far below the usual amount of former years. If so, what is to hinder the year being a happy one in a financial sense to those engaged in the manufacture of brick. It is safe to say that each and all will strive to rush their yards the coming season, unless before it is time to start the market should fall to the figures of the corresponding ones of the previous year. The number of permits for the first three months of the year should show what the prospects will be; then compare it with former years, and one can judge the outlook for '98. The building of new houses and offices would needs be on a very large scale to help keep up the price if production should continue as it has for the past few years. As has been told before, '95 was the third largest in number of building permits, and when compared in price for brick with '86 and '87 it was simply not in it.

—Close of Navigation.—

The Hackensack and upper Hudson are closed at present with ice. The upper Hudson no doubt for the rest of the winter; the Hackensack may open if the weather remains as at present writing (December 28th). In fact, the brickmakers are loading two large barges with the expectation that a few days of mild weather next month will allow a tug to push its way through the soft ice. On the 23d the two barges reached the yards, when they began putting brick on them. On the 24th it was so cold and the wind was so strong that some of the men gave out; others took their places, but at noon they gave it up entirely, as ice was forming so fast that if they had worked till noon Christmas and gotten the barges loaded they could not get them out. On Monday, the 27th, the cold snap moderated, and they will finish loading them to-day.

—New York—

Is the market to which the majority of the brick is sent. To it one must look. The figures furnished by the Department of Buildings give an idea of what to expect for the coming year, as the following figures will show what the difference is for nine months of '96 and '97. When permits are granted, many of them are not used, while others may be held over till the next year, so that a comparison of the number issued and the number in course of erection in the same length of time may be larger, as those taken out the year before may appear in this year's list. The total number of plans filed from January 1 to September 30, 1897, was 2,801, to cost \$68,504,190. The same length of time in 1896, 2,555, to cost \$62,428,805, a difference in

favor of 1897 of 246 plans and in cost \$6,075,385. The number of buildings commenced and completed in the nine months: The number commenced, 2,299; completed, 1,979, in 1897; commenced in 1896, 2,175; completed, 2,380; which shows that 205 more were under way in 1896 from the previous year.

—Brooklyn—

Makes quite a show in point of numbers, but when the comparison in cost is made it shows that the class of buildings is of a different grade. The number of permits issued from January 1 to December 1, 1897, were 3,441; same length of time for 1896, 2,982. The cost of same, 1897, was \$14,785,058; in 1896, \$12,486,359. Number of buildings erected, 1897, 2,805; in 1896, 2,861. Estimated cost of buildings erected in 1897, \$11,818,321; in 1896, \$11,203,657. Buildings in process of erection, 1897, 1,886; for twelve months of 1896, 1,328. Estimated cost of those in process of erection, 1897, \$11,327,666; for the year 1896, \$9,940,637. The difference in number for 1897 is 459 more permits. In cost 1897 leads with \$2,298,699. In number of erection, 1896 makes a showing of 56 more. Estimated cost of buildings actually erected in 1897, \$11,818,321; in 1896, same length of time, \$11,203,657, with 1897 ahead \$614,464. Number now being erected, 1,886; for the whole year of 1896, 1,328, or for the eleven months of 1897 as the year of 1896, 558 more in favor of 1897. The cost of those now being erected, 1897, \$11,327,666; in 1896 for the whole year, \$9,940,637; 1897, with one month to hear from has in value \$1,387,029 in her favor.

What a benefit would result if the class of buildings were the same in the borough of Brooklyn, as it will be called after January 1, 1898, when it becomes part of Greater New York. The cost of projected buildings in New York City for nine months of present year amounts to \$68,504,190; in Brooklyn for eleven months is \$14,785,058, or \$53,719,132 in two months' less time. Brooklyn has been called a residential city. When one looks at the combined cost of 3,441 buildings as only fourteen and three-quarters million dollars, it proves that residences, as well as places of business, are of the wooden order—the product of clay is about the smallest cost in the building.

—What to Expect.—

The coming year can be judged from the figures above. If (what many in the trade expect) an active demand, how many more permits will be added, how much more in cost, and last, but not least, will the call for brick be so much increased that it will take what difference there will be if the expected shortage of this year is realized when the returns are in, as against the output of one thousand millions of the past few years? December, 1898, will reveal.

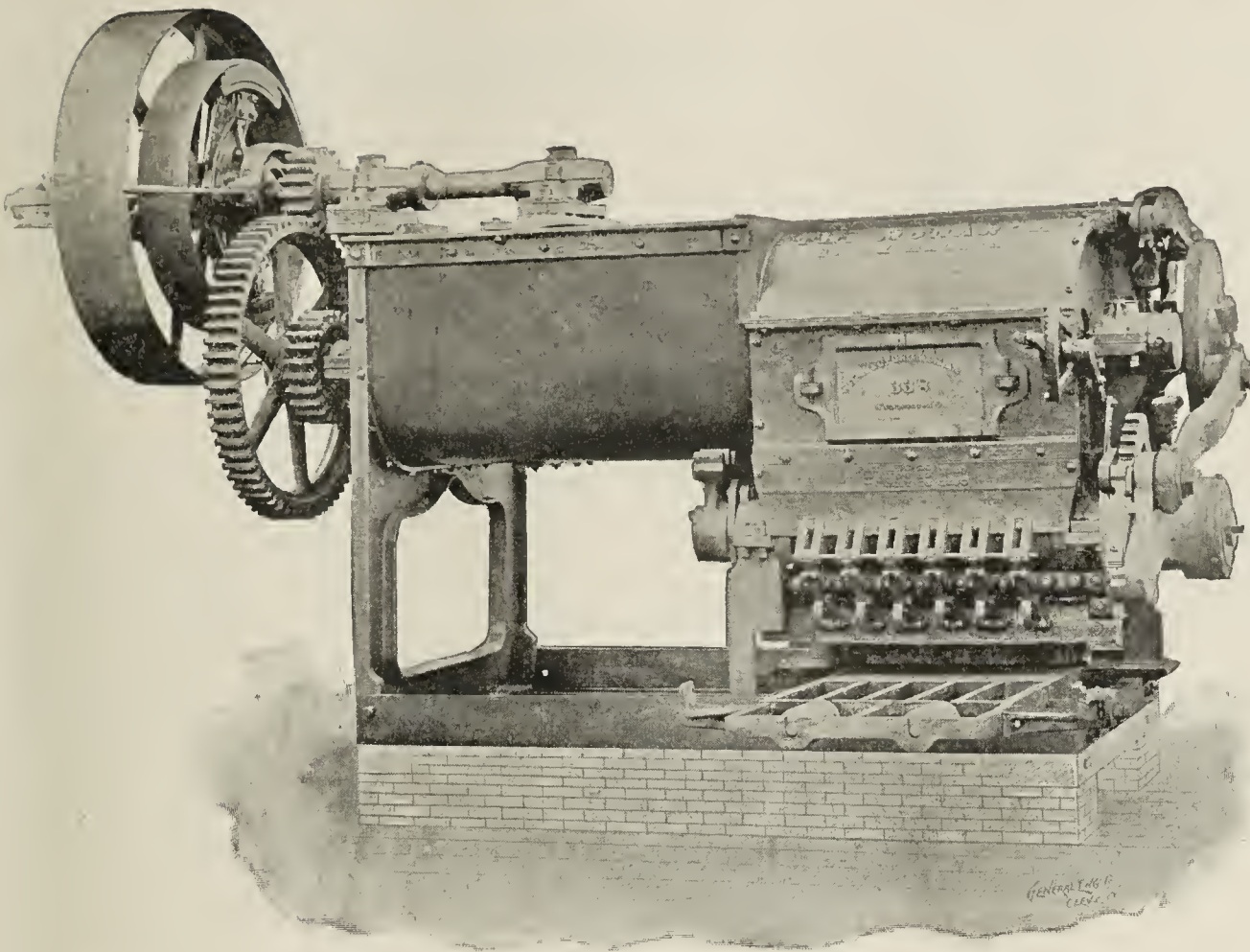
—A Great Deal of Sand—

Is needed in the making of brick, and is getting scarce along the Hudson, so much so that the time is not far distant when it will be a mint to the owners. A far-seeing man, the Vice-President of the N. B. M. A., has bought Plum Point, just below Newburgh, to furnish sand to the yards in Newburgh Bay. As Plum Point is to furnish sand, some of your readers may remember when it was bought for clay—yes, when the good old times in the trade, nearly thirty years ago, it was put up for sale and many men in the trade attended the sale. A gentleman from Haverstraw, Mr. Theodore Fredericks, was the purchaser. In those days the land was not so thoroughly searched and bored as now. When he came to investigate he found but little clay—in fact, not enough to warrant putting up a yard. Some say that it was fixed; the truth of that assertion, however, has never been proven. He paid over \$20,000 for it, and it has never been used for anything in the years gone by. He sold it some years ago.

—The Present Brick Market—

Is one to warm the cold heart of the brickmaker, who has had nothing to comfort him for some years. It comes late in the season. Though some may reap the benefit, others cannot by reason of the ice. The yards on the lower Hudson and South Jersey can place their stock while other manufacturers are shut in. But, as before mentioned, they are loading boats, trusting to Providence for a warm spell to get about 570,000 brick down the river. The seller feels so secure that he will not place a cargo to arrive, which he is usually anxious to do, as he does not want to place a price until the boat arrives, as a day may make a vast difference in the rate, as all want brick, and the supply is not coming to hand as largely as two weeks ago. Pale has reached \$3.50, or a higher figure than South Jersey sold for the past summer, with Hudson river selling for \$5.75 and \$6.25. How is that? Jersey hards selling from \$5.25 to \$5.75, with a good demand, and at the end of last week the agents mustered courage to make the demand from \$5.50 to \$6, and did not scare the buyer or have him say "I can beat that figure, but want to close the deal." Possibly by the time this goes to press a still higher rate may prevail. Only time and the amount of cold weather will tell. A. N. OLDTIMER.

Hackensack, N. J.



Attracting a Crowd

That's what the Pittsburg Convention is doing.

We'll be there; look us up, and we will tell you

Why

Our machines are like the man on the stack—

Up at the Top.

The "Monarch"

Horizontal; with Double Pug Mill and Double Presses, and other valuable features contained in no other.

The "Iron Quaker"

Upright; simplest, best and lowest priced of any real competitor.

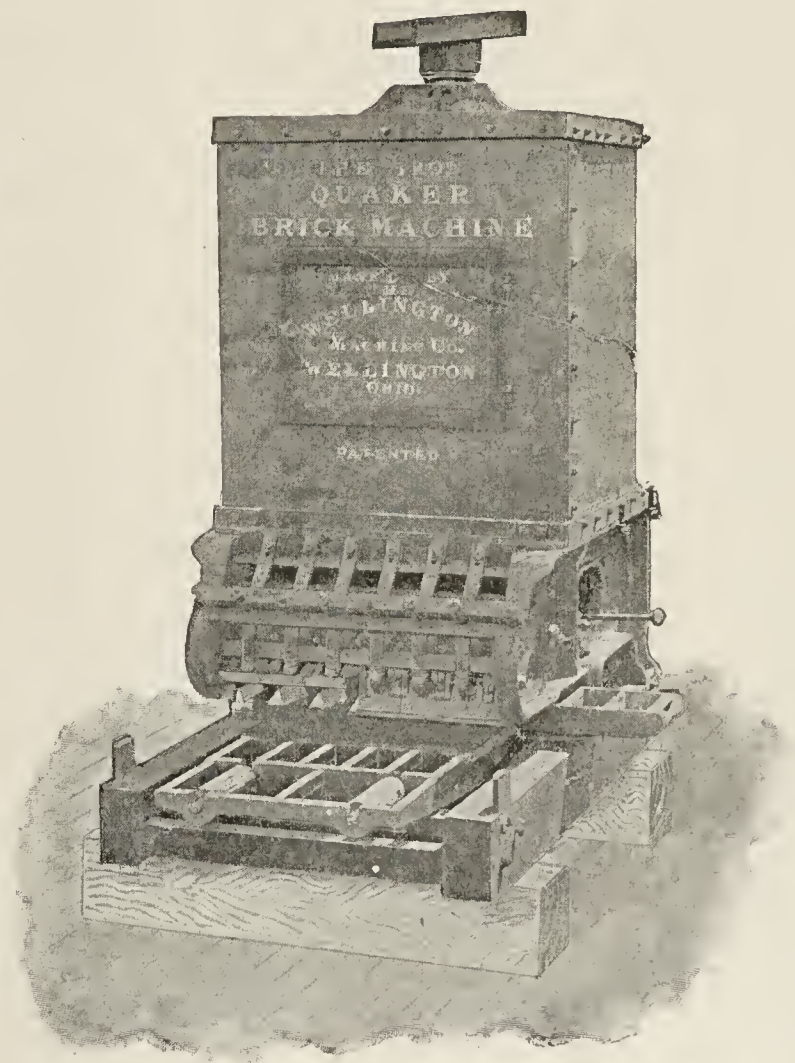
These two machines are unquestionably the leaders of the "sand-moulding" class.

AUXILLIARY MACHINES AND SUPPLIES

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.

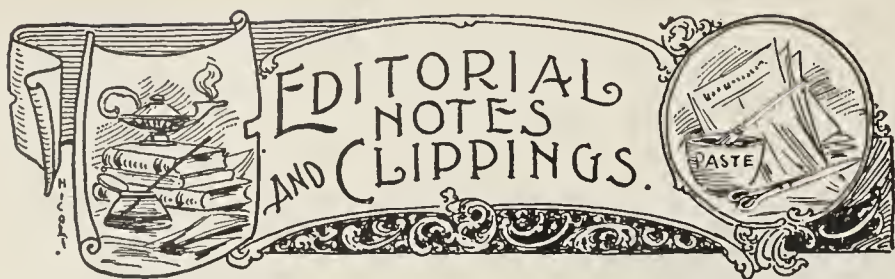


FOR SALE.

Odd sizes of moulds. Have not been used.
5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{13}{16} \times 4\frac{3}{16} \times 2\frac{7}{16}$. 9-16 in. partitions.
17 hand moulds (3's) standard size.
Second-hand, but used a few days only.
10 moulds, $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{3}{4} \times 2\frac{9}{16}$. " "
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{4}$. 9-16 inch partitions.
10 moulds, standard size.

The Wellington
Machine Co.,
WELLINGTON,
OHIO.

Send
for
Circular.



J. M. Cairnes will start a brickyard at Fair Hope, Pa.

Bernard Siener will erect a new brick plant at Bellevue, Ky.

Frederick Bros. will build a new brick plant at Mill Hall, Pa., in the spring.

S. Magg & Bros., of Iowa, are considering the purchase of Thomas Bros.' tile plant at Florida, Ind.

Joseph Philbrook has leased the brickyard of E. B. Mallett at Freeport, Me., and will operate same the coming season.

The Kentucky Portland Cement Company, Valley Station, Ky., are on the market for two hand-power brick machines.

J. E. Davis, Chandler, Oklahoma Territory, writes that he wants to buy a brick machine of about 20,000 daily capacity.

The Star Brick and Tile Company, Youngstown, Ohio, advise us that they have just started a brick and tile plant at that place.

Spokane has completed her first paved street, and the brick enthusiasts are rejoicing over the fact that it is paved with brick.

Knapp Bros. & Co. are making some improvements in their plant at Crowley, La., to further increase their facilities for making brick.

A. H. Dickey and W. R. Croit will probably erect a plant at Iola, Kan., for the manufacture of sewer pipe, drain tile, fire and paving brick.

William Smith intends making extensive improvements in his pottery at Bridgeton, N. J., putting in larger and more modern machinery.

The Northfield (Minn.) Brick Company is putting in a new boiler and engine, and making other changes preparatory to an early start in the spring.

C. Setroon and C. H. Miller will erect a large brick works at Opelousa, La. The machinery has been ordered and the plant will have a capacity of 50,000 daily.

John Winder, 8 Kasota Building, Minneapolis, Minn., writes that he is thinking of starting a brickyard in that vicinity, and is on the lookout for brick machinery.

David Haines has succeeded to the proprietorship of the brickyard at Yorktown, Pa., formerly owned by Aaron Haines, his father, who died some time since.

The Grassland (Ill.) Brick and Tile Company has been incorporated to manufacture brick, tile and other clay products. L. Heiligenstein is President of the company.

The T. B. Townsend Brick and Contracting Company are making extensive improvements in their factory at Zanesville, Ohio, that will greatly increase their facilities.

The tile plant of Carpenter & Dodge, Jamestown, Ohio, was almost totally destroyed by fire Christmas morning. The loss is about \$2,000, on which there is about \$900 insurance.

The H. Berthelet Sewer Pipe Company has been incorporated at Milwaukee, Wis. The incorporators are Henry Berthelet, A. H. Wells and James Morriso. Capital stock, \$2,000.

John B. Davis, in renewing his subscription to the Clay-Worker, asks to have his address changed to Blackford, Idaho, where he says he will start a brickyard the coming spring.

The Bell Pottery Company, of Findlay, Ohio, has been incorporated, with a capital stock of \$150,000, by William B. and E. F. Bell, William I. and T. M. McLure, and James A. Bone.

Parties desiring to invest in a dry pressed brick plant will do well to investigate that advertised in our For Sale column in this issue over the signature "Lock Box 277, Zanesville, Ohio."

We are advised by John C. Lysat that he is thinking of starting in the brick business at Flemington, N. J., and would like to buy a second-hand two-mold dry press and a small dry pan.

In a recent letter E. I. Johnson, Alvin, Texas, says: "We have a country down here that needs to be tiled, and would be very glad if you would send a good man to put up a tile factory."

The Queen City Brick and Tile Company has been organized at Cumberland, Md. Among those interested are E. C. Hender-

son, F. C. Perry, J. W. Smith, H. N. Hodgson and F. A. Blaul. Mr. Henderson has had a great deal of experience in the brick business.

The partnership of Voight, Benson & Johnson, brick manufacturers, North Minneapolis, Minn., has been dissolved, Mr. Johnson retiring. The firm will hereafter be known as Voight & Benson.

The Johnsonburg Vitified Brick Company has been organized at Portland, Me. The officers are Edward K. Milliken, Deering, Me., President, and Charles A. Hight, of Portland, Secretary and Treasurer.

C. P. Walker, Perry, Oklahoma, advises us that he contemplates starting in the brick business at that point, and would like to correspond with a responsible firm who would be willing to make tests of his clay.

An explosion caused by a leakage in the gas connections occurred at the Sheridan (Ind.) Brick Works. Three men were badly injured; two of them, it is feared, cannot recover. The loss to the property is \$5,000.

The death of J. W. Hart, the well-known brick manufacturer of Taunton, Mass., occurred in that city December 27th. Mr. Hart was seventy-one years old and had been engaged in the brick business for many years.

The J. M. Blair Brick Company, of Cincinnati, Ohio, sold 6,000,000 brick last year, which they consider was doing very well, all things considered. They think the outlook for the coming season is very much better than last.

The Eldora (Iowa) Clay Manufacturing Company, which has been shut down for the past six months, will soon resume operations. They will put in new and improved machinery, making one of the finest sewer pipe factories in that State.

A charter has been issued to the Vanport (Pa.) Brick Company, whose principal office will be in Pittsburgh. The incorporators are Frank Moore, Edward P. Botsford, Alvin K. Riley, William T. Dunn and George Rollings, of Pittsburgh.

George W. Haag, Centreville, Miss., in a recent letter, advises us that he would like to purchase either a soft mud or stiff clay equipment. He wants a complete outfit. Would not object to second-hand machinery, as it must be cheap.

The brick plant of M. W. Sands, North Cambridge, Mass., was almost completely destroyed by fire December 24th. The loss is estimated at between \$10,000 and \$15,000, which is partly covered by insurance. The origin of the fire is unknown.

The tile factory of Theodore Joute, at Mattoon, Ill., was almost totally destroyed by fire December 28th. The loss, which runs up in the thousands, is almost covered by insurance. Mr. Joute is of the opinion that the first was started by tramps.

The Champlain Brick Company, Mechanicsville, N. Y., has been incorporated, with a capital stock of \$20,000, for the manufacture of paving brick. The directors are Dr. C. W. Keefer, N. W. Squire and William H. Duffey, all of Mechanicsville.

Mr. Judson Stark advises us that the Stark Brick Company has finally been chartered to manufacture brick at Tunkhannock, Pa. The company owns about 1,000 acres of valuable clay and shale land, and will invest about \$100,000 in a plant.

The past season was a bad one for Detroit brickmakers, not so much in the number of brick sold as the price obtained for them. Mr. Conrad Clippert says the prospect for next season is excellent; brickmakers anticipate better times and better prices.

F. I. Shiers, for four years past the Superintendent of the Granite State Brick Company, has resigned his position to accept that of Superintendent of W. L. Davis's brick plant at Berlin, Conn. J. H. Conley, who has been with Mr. Davis, has returned to M. E. Jacobs's yard.

The partnership of Sherman & Wasson, brick manufacturers at Everett, Wash., has been dissolved. B. F. Wasson will continue in the business, and will renovate the plant, putting in new machinery and enlarging the capacity of the plant. Mr. Wasson says he now has on hand contracts calling for 1,000,000 brick.

Mrs. A. M. Entress, Webster avenue and Kirkpatrick streets, Pittsburgh, Pa., having put in a Martin machine in 1890, has just ordered one of the latest improved and heaviest Martin machines through the local agents, Messrs. Sankey Bros., 2101 Carson street, Pittsburgh, and which is expected to arrive at destination during the holidays.

The new year has come, and brings glad tidings, especially to the clay miners of New Jersey, in the shape of increased demand for the pottery clays for which New Jersey is famed. From Woodbridge, the famous clay-mining center of Jersey, the vast quantities of clays will be shipped from the various mines. Mr. P. L. Ryan, one of the leading miners, writes that

[CONTINUED ON PAGE 54f.]



A Royal Line

OF CLAYWORKING MACHINERY is the line we now offer the trade. A line that is the result of many years practical experience, for though our present plant is comparatively new, (the equipment is all the better for that,) those in charge have grown gray in the work of designing and making clay and cement machinery. Two years ago, under the direction of Mr. A. Bonnot, the well-known inventor and manufacturer, of Louisville, O., (for a time at Canton.) we began the manufacture of Clayworking Machinery of all kinds, and now have the best line of up-to-date brick, tile, pottery and cement machinery now on the market, including:

The ROYAL BRICK AND TILE MACHINE,

Three sizes with daily capacity of 30,000, 45,000 and 60,000 wire cut Brick.

The ROYAL AUTOMATIC CUTTING TABLE,

For either side or end cut Brick. The wires move laterally as well as downward in cutting, thus avoiding all ragging.

The ROYAL CUTTING-OFF DUMP TABLE.

Which is par excellence for all kinds of heavy blocks, moldings or long material.

The ROYAL PUG MILL,

Made in three sizes; 10 ft., 12 ft. and 14 ft. long, single or double gear.

ROYAL DRYER CARS,

Flat cars, double deck cars, rack cars of all kinds and of our own make.

ROYAL DRY PANS, Any desired size up to 10 ft.

ROYAL HYDRAULIC PUMPS, For Filter Presses or Slip Vats.

ROYAL SIFTER, Two sizes 24 x 30 and 36 x 42.

ROYAL DOUBLE and TRIPLE PLUNGER MILL, Three sizes; all iron and steel.

ROYAL REVOLVING SCREEN, That never clogs, being self-cleaning.

ROYAL JOLLYS, For from 1½ gallon to 8 gallons.

ROYAL TUBE MILLS, For pulverizing clay or cement, built any size, 36 to 60 inches in diameter, 12 to 24 feet in length.

And a full line of Brick and Tile Yard Supplies that are as good as money, skill and brains can produce.

That our Machinery is in demand is attested by the fact that our factory employing thirty hands or more, has been running 10 to 14 hours a day all through the past year. Our machines are sold under a positive **guarantee**. Our facilities for manufacture are unexcelled. If you want anything in the line of Clayworking Machinery, don't fail to get our prices.

The A. Bonnot Mfg. Co.,

LOUISVILLE, OHIO.

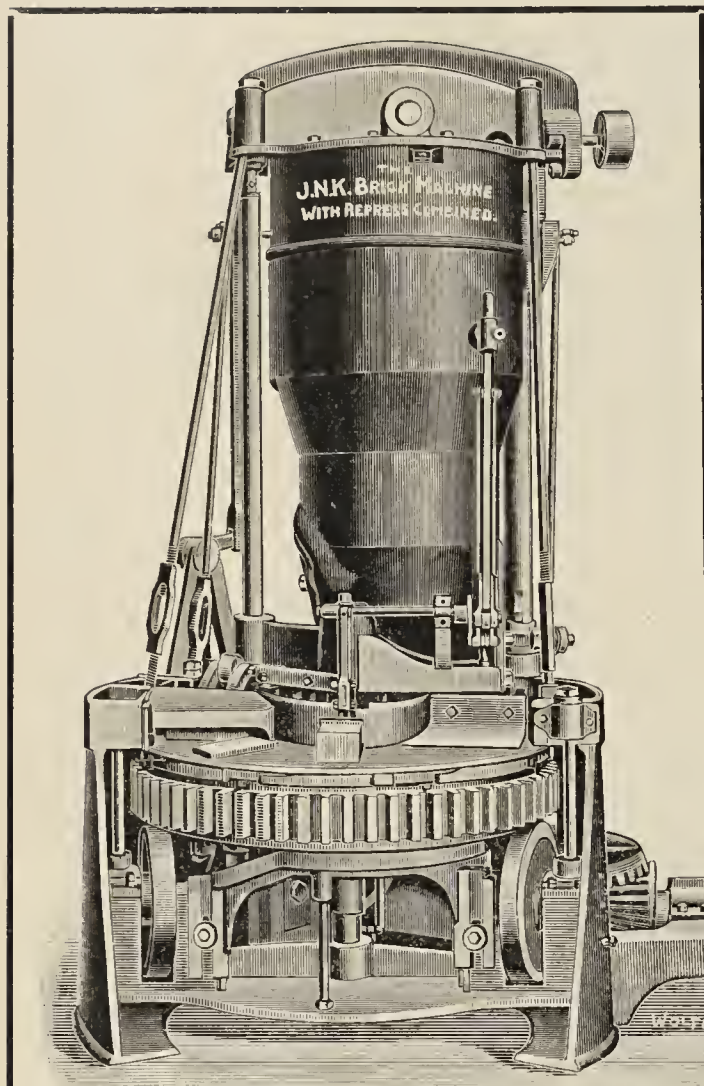
It was reported some time back that Mr. Bonnot was DEAD TO THE WORLD of clayworking machinery. We are glad to announce that he will MATERIALIZE at Pittsburgh the week of the Convention, and SHAKE with every member of the N. B. M. A., who will extend the glad hand to a LIVE dead man.



A GREAT IMPROVEMENT IN STIFF MUD BRICK MACHINES.....

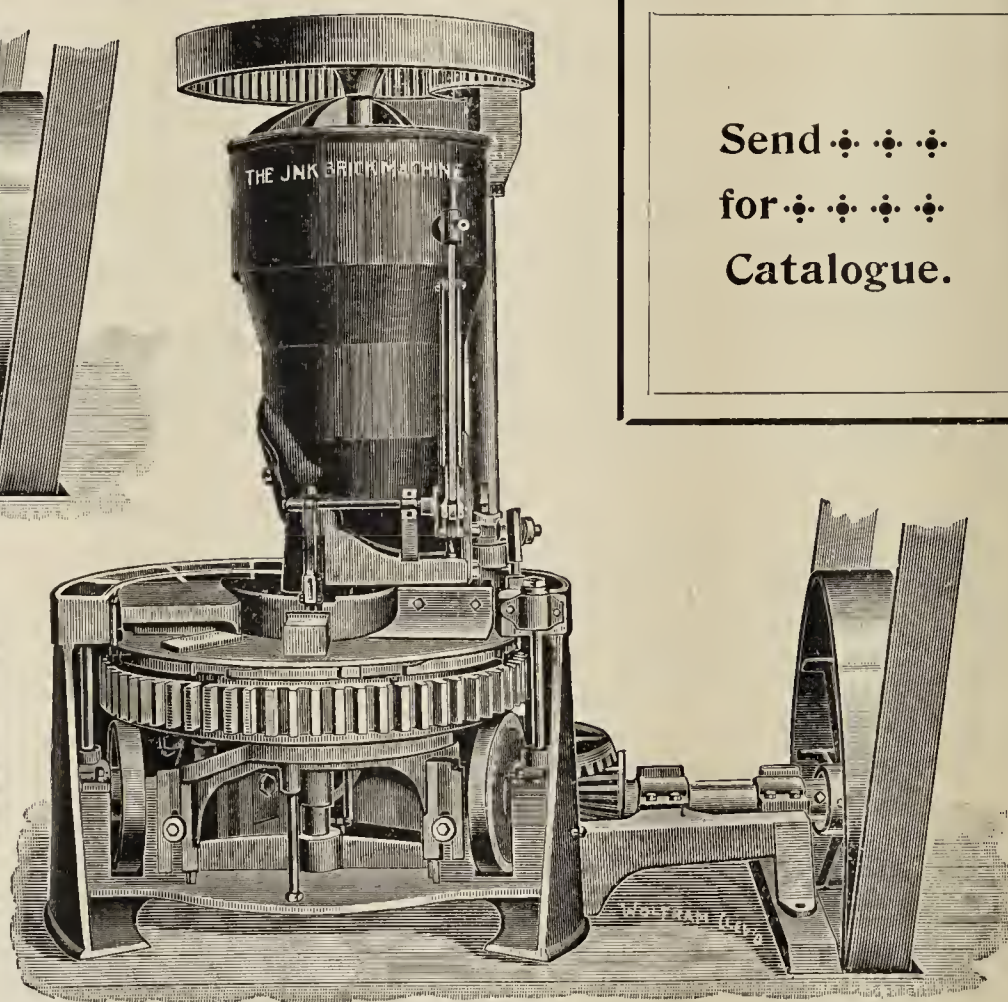
The J. N. K. Brick Machine

With Repress Combined.



The J. N. K. BRICK MACHINE with
Repress Combined.

THIS MACHINE has eight molds in the mold wheel, and the wheel revolves and brings the mold under the clay cylinder, where the molds are filled, then pressed to an even thickness, then comes the repress and represses them, next the brick is pushed out of the molds and onto a belt, then the mold is wiped and oiled and passes on under the clay cylinder again; now you have followed one mold around, and have made eight brick, now you can see as one brick is being made, one is pressed and one is repressed, one pushed out and one pushed off, and one mold wiped and oiled, and the repress is wiped and oiled every time it makes a brick, by these combined movements there is no time lost as 45 brick are made in one minute, and repressed and pushed off, and the molds wiped and oiled in the same minute, as all these movements act at the same time. With this machine fine repressed brick can be made as cheap as common brick.



The J. N. K. BRICK MACHINE without Repress.

Send . . .
for . . .
Catalogue.

The J. N. K. Brick Machine

Without the Repress will make 60 brick per minute, square, even in thickness, smooth top and bottom, sharp corners and edges, parallel in thickness, a good nice-looking brick, the mold is wiped out and oiled, and the brick are made the same as the brick on the repress machine, and the movements are the same, except the repress taken out, and it can readily be seen what I mean by a great improvement in stiff mud brick machines. As I manufactured the P. L. Sword Machine for about 10 years and having heard of all complaints, and objections to it I started out four years ago, when I bought them out, and began to remove all these though it has taken me four years of hard work and thousands of dollars to accomplish it, the results are the J. N. K. Brick Machine has none of these objections, which were made against the P. L. Sword machine; namely, the press plate and cut-off knives are not used on the J. N. K., as the brick are finished under the cylinder. The molds, when first filled, are filled one half-inch fuller than you want the brick; this surplus half-inch of clay is pressed back, under a heavy pressure into the cylinder, and the pressure is kept on till the brick is finished, so there cannot be any shifting of the clay to one side. The J. N. K. has a thorough system of wiping and oiling the molds. I will further say to those that are using the Sword Machine and are in need of a new mold wheel, or any other repairs, I respectfully request a continuance or the liberal consideration, which was at all times shown to me, by those who purchased from me. Any one wishing further information on the J. N. K. Brick Machine or desiring a P. L. Sword Machine or any part thereof, address

Central Machine Works,

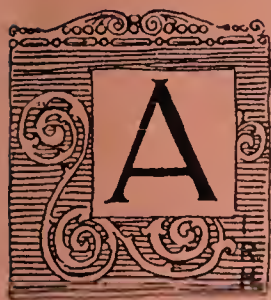
JOHN N. KAUFHOLZ, Proprietor,

OFFICE AND WORKS:

226-236 Abbey Street.

CLEVELAND, OHIO.

The 12th Annual Convention
OF THE
**National Brick
Manufacturers'
Association** will be held at
PITTSBURGH, PENN., TUESDAY TO FRIDAY,
FEBRUARY 15th to 18th, 1898.



FULL VERBATIM REPORT of this Convention, which bids fair to be the most successful in the history of the N. B. M. A., will be given in the February CLAY-WORKER, including all papers, discussions and portraits of prominent members. Next to attending the Convention, the best thing a brickmaker can do is to read the CLAY-WORKER's report. It is so full and accurate that those who attend the Convention would not be without it, and those who don't go can't afford to miss it. The consensus of opinion among progressive brick-makers is that the Convention Number of the CLAY-WORKER is the most valuable publication of the year. If you are not already a regular subscriber don't neglect to send in your order in time to get the February or Convention Number.

1898 FEBRUARY 1898						
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6	7	8	9	10	11	12
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27	28					

ADVERTISING MATTER TO INSURE INSERTION
MUST BE RECEIVED BY THE FIRST OF THE MONTH.

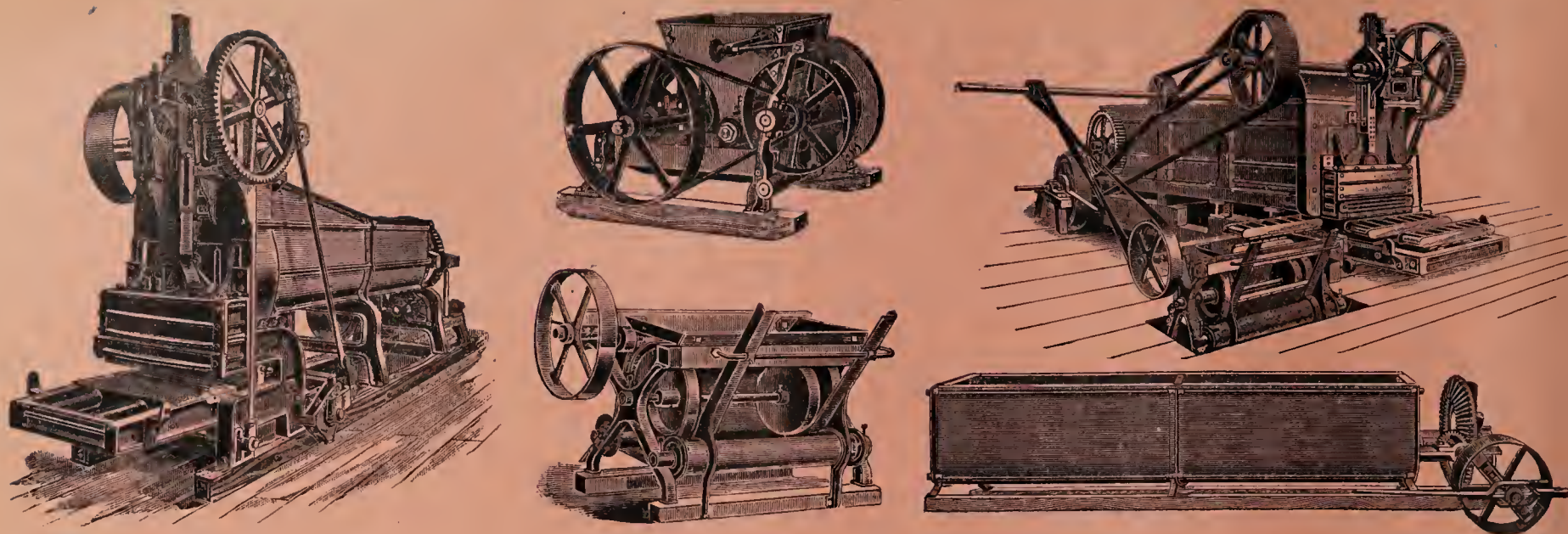
The CLAY-WORKER is now in its 15th YEAR and is recognized the world over as the best clayworkers' magazine published in the English language. It has more readers at home and abroad than all its followers combined. Take the CLAY-WORKER and you get the best value for your money. \$2.00 a year. Every issue is worth that sum.

T. A. Randall & Co.,

PUBLISHERS,

INDIANAPOLIS, IND., U. S. A.

The Clay-Worker Is Unequaled As An Advertising Medium.

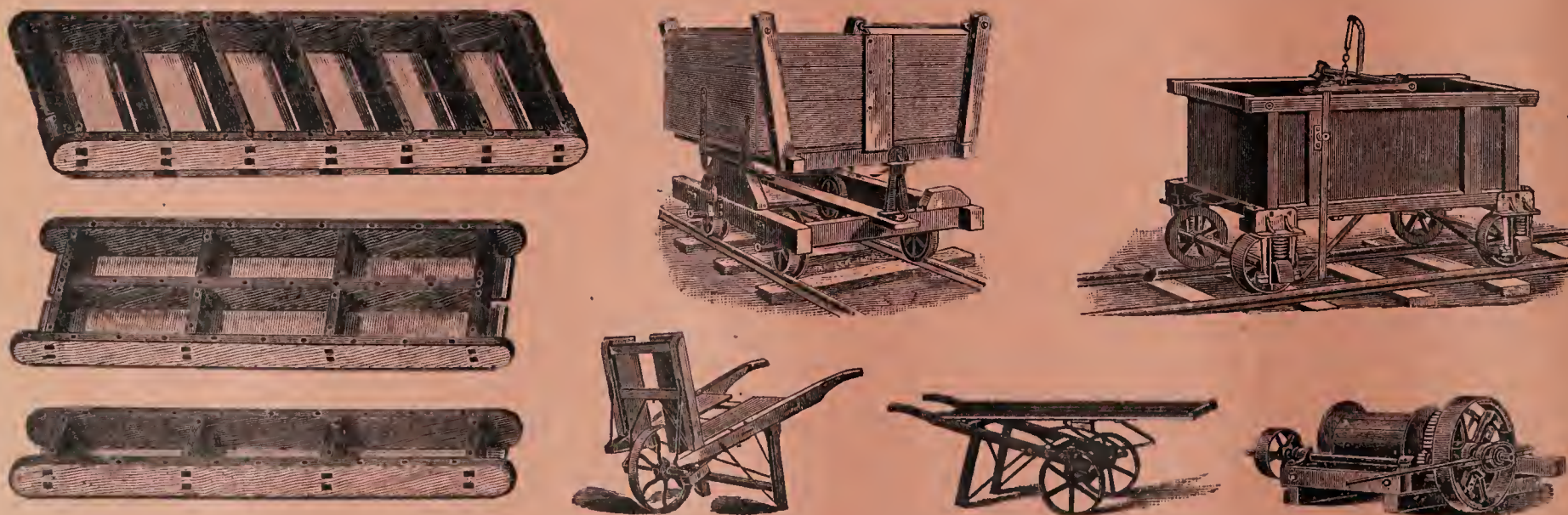


We Manufacture

THE Most Complete Line of Soft Clay Machinery in the United States: Horizontal Stock Brick Machines, Disintegrators, Mould Sanders, Pug Mills, Granulators, Cars, Winding Drums, Trucks, Barrows, Moulds, Shafting, Pulleys, Hangers, Kiln Castings and all Brickyard supplies. We save you all commissions.

Write for prices and terms.

C. & A. POTTS & CO., 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**



(See Ads. on Pages 68 and 78.)

Reduced Rates

TO THE

NATIONAL BRICK MFRS' CONVENTION

AT

Pittsburgh, February
15th to 18th,

VIA THE

Picturesque Baltimore & Ohio Railroad,

\$14.70 Round
Trip,

From CHICAGO.

The B. & O. Depot at Pittsburg is located at the corner of Smithfield and Water Street, directly opposite the Monongahela House which will be Headquarters for the delegates.

SPECIAL PULLMAN SLEEPING CAR will be attached to train leaving Grand Central Passenger Station at 3:30 P. M., February 14th, arriving at Pittsburgh in time for early breakfast the following morning.

Dinner will be served in Dining Car.

Tickets good going from February 11th to 16th—Returning until 22nd.

B. N. AUSTIN, G. P. A.,

W. W. PICKING, City Pass. Agt.,
193 Clark Street.

•—CHICAGO.—•

PACIFIC COAST NEWS.

THE NEW YEAR did not open with a rush in the clay-working trade, locally speaking, which fact is not disappointing, as nothing more was expected, inasmuch as quietude has prevailed for several months past. Other lines of trade are undergoing an improvement, and there is no reason why our trade should not do the same. The dealers are imbued with the idea that better times are in store for them in the "sweet by and by," if not in the near future.

Baird & Paul, brick manufacturers of Enderby, B. C., have dissolved partnership.

Improvements have just been completed at the plant of the Switzer Brick and Terra Cotta Company, at Blossburg, Mont., which will increase the capacity and improve the quality of the ware. In the spring it is the intention to erect large sheds to sort the brick into lots of even shade and quality, thus giving the builder or architect an opportunity to select any brick that may suit his idea of color as well as his purse. Various designs of ornamental brick will be made, and machines made especially to grind particular shapes for arches will be put in.

Many improvements are being made at Warm Springs, Anaconda, by the Anaconda Company, and it is understood that the company will make 9,000,000 brick next season at the West Side brickyards. The East Side yard will also be kept busy.

The contract for supplying the pressed brick for the new Wells-Fargo building in San Francisco has been awarded to the Steiger Pottery, of Baden, Cal.

The Stockton, Cal., Art Pottery will resume operations again about the middle of this month, after a short shut-down. Work was suspended to make improvements and to clean up the stock of 1897, and because of the quiet time that always occurs between the holidays and spring. But the demand for their goods has been excellent, and the pottery will start again with an increased force.

The brickyards at the river near Stockton, Cal., have closed down for the season, after the most prosperous run they have had in years. Common brick were in demand at \$6 a thousand, and more than that would have been paid by contractors in case of necessity. Prices advanced from \$5 to \$6 per thousand during

the year, and there are enough orders ahead to start the yards early next season at a good run. Over 400,000 brick were burned in three months at the local yards. The owners say that they are sorry they did not build more kilns, as they could have sold them without any trouble.

Mr. Hitesman, who owns kaolin clay mines near Lehi, Utah, has brought 1,000 pounds of it for distribution at the potteries in Salt Lake City for a further test. The clay is of a pure white color and very smooth and glossy, and contains some oil having an odor of carbolic acid. The company has one vein in sight fifteen feet wide.

The new pottery on East Main street, Los Angeles, Cal., has now begun work.

C. H. Bevins, who runs a brickyard at Idaho Falls, Idaho, recently examined several places in the vicinity of that town, and found a deposit of clay. He made it into brick and burned it with the others he had ready for the kiln. An examination of these brick showed them to be of a fine quality. The brick has a good color and is hard and tough. Mr. Bevins will most likely make a larger number of pressed as well as common brick.

The Remillard brickyard, near Pleasanton, Cal., is being covered with clay taken from the bottom of the pit, preparatory to next season's work. When dry, this covering will be smooth and hard.

The Capitol Machine Brick Works, at Los Angeles, Cal., supplied 20,000,000 brick to the contractors of that city, and it is expected that 30,000,000 will be required this year, as a result of the increased building boom.

SUNSET.

IN A CHEERFUL VEIN.

Editor Clay-Worker:

Enclosed please find \$2 for subscription to the Clay-Worker for one year. It has become such a welcome visitor that I wouldn't like to do without it.

The past season has been a little better than the four or five preceding ones, and the outlook for '98 is brighter still.

Hoping that you may have many things to be thankful for,

I am

Toronto, Can.

Yours respectfully,

J. RUSSELL.

The Lehmann ^{Portable} Continuous Kiln,

And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

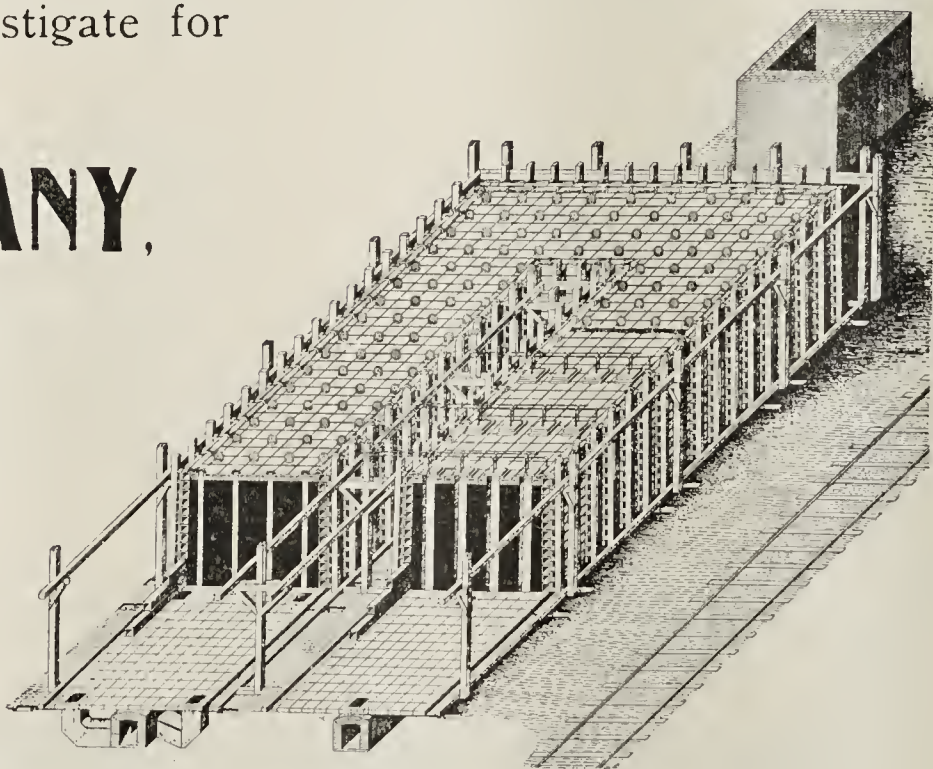
F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,
Plans and estimates furnished for Brick, Lime and
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.



BRICK MACHINERY

Wonder No. 4.

Capacity, 60,000 to 100,000 per day.

Big Wonder.

Capacity, 50,000 to 60,000 per day.

Intermediate Wonder.

Capacity, 25,000 to 40,000 per day.

Little Wonder.

Capacity, 20,000 to 25,000 per day.

BRICK CUTTERS

Cunningham's Side Cut Automatic Cutter.

Cunningham's End Cut 3-Stream Automatic Cutter.

Cunningham's End Cut 2-Stream Automatic Cutter.

Cunningham's End Cut 1-Stream Automatic Cutter.

Side Cut Broad Delivery Table.

Hand Brick Cutting Table.

Combination Side and End Cut Hand Brick Cutter.

PUG MILLS

No. 3, Plain Closed Top Pug Mill.

No. 3, Open Top Pug Mill with Wallace Patent Cleaner Teeth.

Tempers clay for 75,000 to 100,000 brick per day.

No. 2, Open Top Pug Mill.

No. 2, Closed Top Pug Mill.

Tempers clay for 35,000 to 50,000 brick per day.

No. 1, Open Top Pug Mill.

No. 1, Closed Top Pug Mill.

Tempers clay for 25,000 to 35,000 brick per day.

No. 1, Wallace Patent Pug Mill.

No. 2, Wallace Patent Pug Mill.

Tempers clay for 20,000 to 40,000 brick per day.

DRAIN TILE MACHINERY

Little Wonder Makes 3 to 12 inch.

Capacity, 8,000 to 12,000 4-inch daily; others in proportion.

Intermediate Wonder Makes from 3 to 18 inch.

Capacity, 10,000 to 15,000 4-inch daily; others in proportion.

Drain Tile Cutting Tables for large and small tile Trucks for Handling Large Tile.

Reversing Device for large tile.

CLAY PREPARING MACHINERY

Dry and Wet Pans, 6, 8 and 9 feet, with wood and iron frames.

Clay Screens.

Clay Crushers and Stone Separators of many designs and capacities to suit conditions.

Clay Elevators all lengths and widths to suit your desire.

Dry Clay Bucket Elevators of length and breadth to suit desires.

Friction Hoisting Drums.

Friction Geared Hoisting Drums.

Clay Cars. Truck Wheels and Axles.

Kiln Doors and Frames.

Kiln Doors without Frames.

Wheelbarrows for Brick and Tile.

Brick Pallet Spring Trucks.

Engines. Boilers. Pumps.

Shafting, Pulleys, Hangers, Couplings, Journal Bearings and Belting, both Rubber and Leather.

A Long Argument



IS NOT NECESSARY TO CONVINCE PRACTICAL BRICK-MAKERS OF THE MERITS OF OUR MACHINEERY. OUR SUCCESSSES PROVE THAT. . . .

A Case in Point

Is that of the Burnham plant in Milwaukee where we were reported to have made a failure. Under date of October 26th, '97, Mr. John F. Burnham writes:

“You guaranteed the **Big Wonder** to make 50 M brick per day; as a rule we have been able to better that amount by several thousand, and running under favorable circumstances have made as many as 80,000 a day, and you know our clay is very difficult to work. In fact some have said it could not be worked successfully by the stiff clay process—but the **Wonder Machine** is doing it.”

Mr. Burnham's equipment including Granulator, Compound 4-Roll Crusher, Pug Mill, Big Wonder Machine and Cunningham's Automatic Cutter was all furnished by us, and is entirely satisfactory.

Need we say more?

If you want anything in the line of clayworking machinery. Don't fail to get our prices.

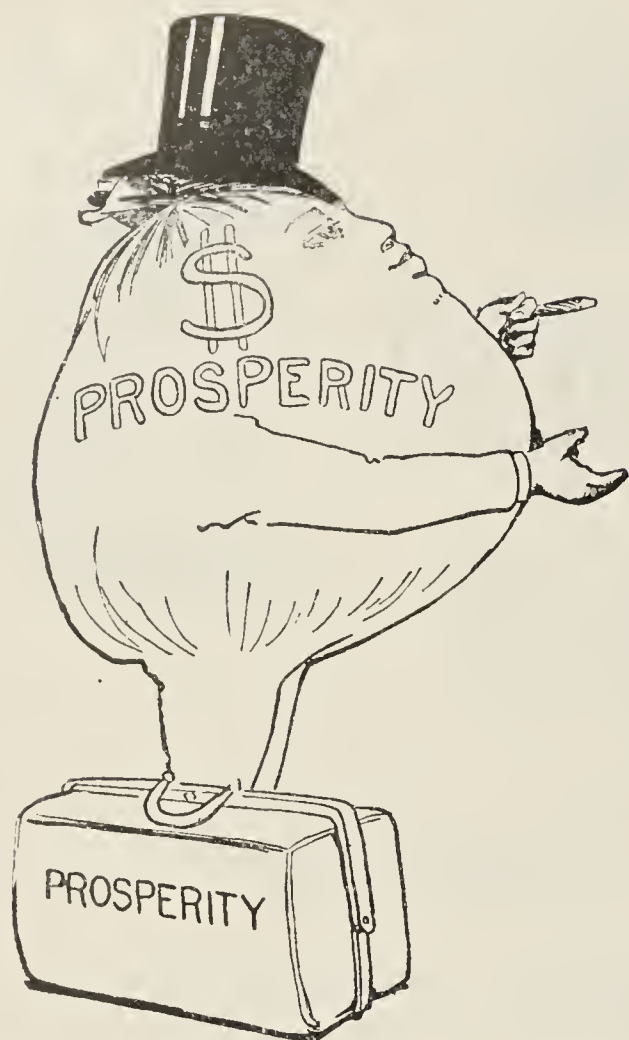
Wallace Mfg. Co.

Frankfort, Indiana.

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

See Ad. on Page 83.



A Prosperous and Happy New Year,



TO ALL
BRICKMAKERS!

MAY PROSPERITY visit each and every one of you and hold out the glad hand, so the New Year may be a Record Breaker in the way of business. We have had our own little visit from Prosperity, and we had to double our office space in order to accommodate him. Hope you will all have to double your output before the season is over, for the same reason.

We can help you to a visit from Prosperity by putting your yard in shape to take care of your share of the business and a little more. Our machinery makes the highest quality of brick at the lowest cost of production. Thus Prosperity comes sooner and stays longer.

We have the best Dry Press in the World, and are prepared to prove it. The same can be said of our Stiff Mud and Soft Mud Machinery. Any of them will insure you a long continued Visit from Prosperity.

The Chicago Brick Machinery Co.,
225 DEARBORN STREET.

NOTICE. Permanent Injunction and an Accounting.

A decree for a perpetual Injunction and an accounting, in the suit in the United States Circuit Court at Cleveland, against J. W. Penfield & Son, has been recently entered, and an **INJUNCTION ISSUED**, restraining the surviving defendant, Raymond C. Penfield from infringing our Patents No. 275,467 of April 10th, 1883; No. 297,671 of April 29th, 1884; No. 297,675 of April 29th, 1884 and No. 362,204 of May 3rd, 1887 (the wheel cut-off.)

CHAMBERS BROTHERS CO., Philadelphia, Penn.



The PEERLESS UP DRAFT KILN.

The latest and best kiln for burning both common and pressed brick. The **Peerless** while embodying new features is not an experiment, having been in practical use for two year and has proven itself a fuel saver and a money-maker. I **guarantee** 95 per cent of hard burned brick.

If you want at once the best and the cheapest Kiln; cheapest in first cost and cheapest in fuel consumption, don't fail to write for descriptive circular.

J. W. CARSON,

LaPrairie, P. Q., Can.

Two for the Price of One.

The two best papers published in the English language for **BRICK and TILE MAKERS** are

**The CLAY-WORKER and
The DRAINAGE JOURNAL.**

WE have made clubbing arrangements which enable us to offer new subscribers both papers for 1898 for \$2.00—the price of one. If you want the best information obtainable in all matters pertaining to the Brick and Tile business, you can't afford to be without either of these representative magazines. They are **the best** of their class. Address all orders to

T. A. RANDALL & CO., Indianapolis, Ind.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED—Second-hand pallets; must be 34 inches long. Answer at once,
SHELBY BRICK WORKS,
11 em Shelby, O.

THE TROUBLES you have with your clay, machinery or kilns, can be remedied. Consult the **TECHNICAL ENGINEER**,
12 tf l care Clay-Worker.

FOR SALE—CHEAP.—"Martin" Steam Power Machine; good as new. Address
FAVORITE,
121 care Clay-Worker.

FOR SALE.—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address,
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FOR SALE.—One of the best paying brick and tile factories in Iowa; part pay in good hand. Address, **PATTON & MUNSON**, Lock Box 11,
11 tf dm Lohrville, (Calhoun Co.) Iowa.

FOR SALE AT A BARGAIN.—One 4-mold Boyd dry press brick machine in perfect condition. **THE FERNHOLTZ BRICK PRESS CO.**,
8 tf l St. Louis, Mo.

FOR SALE CHEAP—100 iron, wood-top dryer cars and 10 to 15 thousand wood pallets, used in connection with cars. All in first-class condition. Address **PHILADELPHIA**,
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WANTED.—Situation as a first-class burner or superintendent; can give the best of references as to ability, etc. Address
TERRE HAUTE,
11 c care Clay-Worker.

WANTED.—One Stiff Mud Machine, end cut, capacity 25,000; must be in first-class condition and very cheap. Address
J. M. CRABILL,
11 d Clarinda, Ia.

FOR SALE.—Two 9-foot Iron Frame Dry Grinding Pans, overhead gear; only short time in use. A bargain to quick buyer. **PHILLIPS & McLAREN**,
11 L Pittsburg, Pa.

WANTED.—A two-mold dry press; second-hand machine preferred, if in good order. State condition of machine and lowest cash price; also location, so we can figure on freight rates. Address **"ATLAS"**,
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WANTED.—Situation as foreman or burner, up or down-draft kilns, fire brick, shale pavers, soft mud dry press; (29) twenty-nine years' experience; number one references. Address **BUSINESS**,
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FOR SALE CHEAP—One new Henry Martin letter A steam brick machine, never used. One all iron Talcott; four hand re-presses, one Dry Pan, one 20 H. P. Portable Engine and boiler; one Potts sander, elevator chain, flange wheels and a lot of moulds. Address
11 d C. & L. MERRICK, Syracuse, N. Y.

FOR SALE.—New Penfield Upright Stock Brick Machine, only used one month; seven-foot wet pan and tailings crusher. All in good order and cheap. Address
ROBINSON BRICK AND TILE CO.,
11 d Bellaire, O.

FOR SALE—As good as new; most of the machinery of a modern 40,000 capacity plant. Cheap for cash. Including repress and hand presses. It will pay you to examine this machinery before committing yourselves elsewhere. Address, **N. Y.**,
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FOR SALE—Brick and drain tile plant; R. R. switch to kilns; soft and stiff mud process; clay good for front brick, fire brick, sewer pipe, etc. Growing market. Will sell or form company with right man with capital and give him management of works. Address
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WANTED.—10,000 Shelving Boards, 1 inch by 4 inches, by 6 feet. Address
J. F. MARTIN,
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FOR SALE.—Half or whole of well-equipped brickyard in prosperous district and near the busiest 8,000 town in northern Michigan; steam power, 20,000 a day. Address
"BRICKYARD,"
13 cm 432 S. Jefferson, Saginaw, E. S., Mich.

WANTED POSITION—Practical, experienced, up-to-date man. Can manage your whole plant, machinery and all, economically; size him up; see if he will suit you; experienced in Southern clays; references. Address
M.,
11 cm 316 Walker Street, Augusta, Ga.

FOR SALE.—One Frey-Sheckler 4 roll Crusher; lot Tile Dies for Centennial; Paving Brick Die, 2½ by 9; 30-horse-power Engine and Boiler; some Shafting, Pulleys, Gearing, for Centennial Tile Mill; any or all very low. Address
ELLIS & HELFENBERGER,
Indianapolis, Ind.

WANTED—A position on a dry clay press brick plant, as superintendent, by a German-American possessing good executive ability and a thorough knowledge of clays, pressing, setting, water smoking and burning both up and down-draft kilns; good references. Address
SILICATES,
111 t care Clay-Worker.

FOR SALE.—H. W. CLASSEN & CO., Chas. H. Calssen, Proprietor, Manufacturers' Agents for sale of Sewer Pipe, Fire, Pressed and Paving Brick, Clay Products, etc. Correspondence invited. 305 McDermerry's Wh'f (Long Dock.) Box 8, Builders' Exchange, Baltimore, Md.
13 c

WANTED.—Position as superintendent by an all-round manufacturer of clay products, paving brick, dry press, soft and stiff mud, building brick, building block and sewer pipe. Experienced in building works and remodeling plants, up or down-draft kilns; 30 years practical experience; best of references. Address
G.,
111 p care Clay-Worker.

WANTED.—A situation as head burner and general superintendent, by a thoroughly practical man in all the branches of ordinary brick manufacturing, having spent lifetime at the same; age 35 years; strictly temperate. Can furnish best of references. Address
JOHN EAST,
N. W. corner Maltby ave. and Princess Anne road, Norfolk, Va.
112 p

WANTED.—An expert enameled brickmaker for superintendent enameled brick factory well established; one who understands the business in all its details, as to making, enameling, etc.; state method accustomed to use for enameling, age, nationality, references and where last employed. None need apply unless thoroughly competent. Address
S. E. B.,
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FOR SALE.—A complete Brick Yard Outfit, consisting of an A Special E. M. Freese & Co., Galion, O., stiff mud machine, crusher, disintegrator, winding drum with 300 feet of wire cable, clay cars with complete set of shafting, pulleys and being capable of turning out 25,000 bricks a day; also a ten-track Wolff's Chicago steam drier with 165 brick cars, complete with trucks for storing of empty cars, transfer cars, turntables, all ready for immediate use, and can be had at a bargain by applying in person or by letter to
J. A. BLAFFER,
River Front and Austerlitz st., New Orleans, La.
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FOR SALE CHEAP.

One second-hand, double die Columbian Repress; practically as good as new.

One Quaker Horse-power Brick Machine, in good order.

One Ten Horse Power Portable Engine, in good order. THE HORTON MFG. CO.,
1 tf 1 Painesville, O.

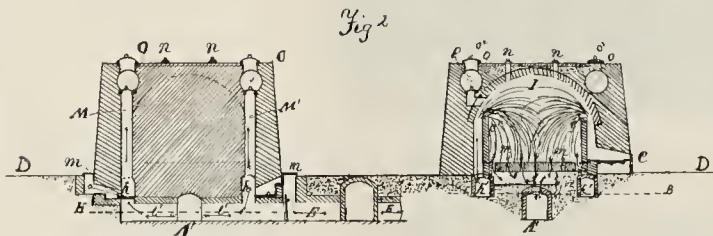
A GREAT CHANCE FOR A PRACTICAL BRICKMAKER.

A brick plant situated near Anniston, Ala., (this city now again coming to the front), and there will be a demand for bricks in 1898; for sale, or will lease to a practical brickmaker on easy terms. We have the finest clay in Alabama for common, red press and buff bricks, jugs and terra cotta, etc. Address
JNO. M. ELLIOTT,
1 tf 4 pm Easton, Ind.

S. GEYSBEEK, Ceramic Chemist,

New Brighton, Pa.

The Down Draft Continuous Kiln.



NUMBER OF PATENTS ON KILN.

Nov. 29th, 1892, 486,972.

Oct. 24th, 1893, 507,274.

Dec. 5th, 1893, 510,265.

Aug. 14th, 1894, 524,442.

Sept. 25th, 1894, 526,492.

Feb. 19th, 1895, 534,509.

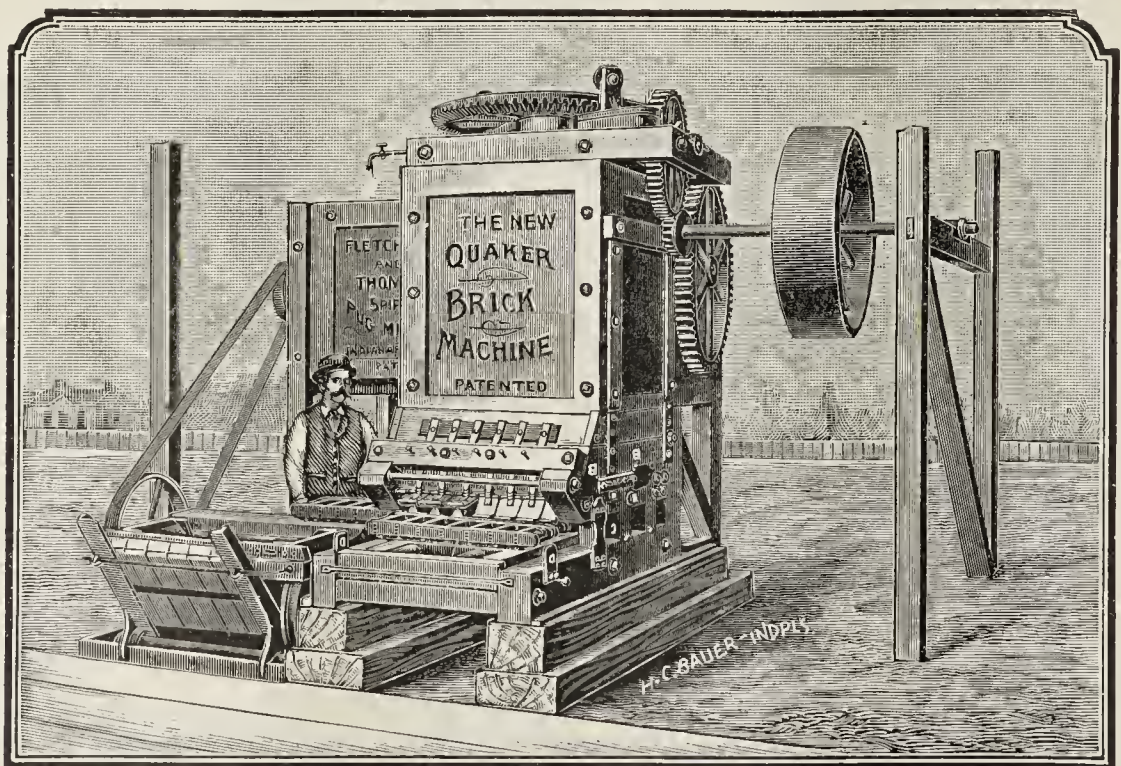
This kiln has been improved to meet the demand of every brickyard. It manufactures the best material that the clay will produce. The advantage of the improvement is that it combines the down draft and the Continuous kiln in one. Any one contemplating the improvement of his product and the saving of fuel should not fail to correspond with me, and get information in regard to construction and rights required.

C. F. KAUL, Madison, Neb.

Soft Mud Brick Machinery

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Iron Quaker, Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first class brickyard supplies at a very reasonable price. It will pay you to send for catalogue and special discounts before placing your order elsewhere.



JAMES W. HENSLEY,

General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,
920 Market Street, - - - ST. LOUIS, MO.

The PERFECT CLAY SCREEN.

Always Clean.
Perforations always open.
Separates the clay to full size of perforation
It is simple, durable and effective.
Impossible to clog or paste it over.
Especially adapted to moist clay.
Purchaser takes no risk.



View on underside showing action of Rotary Brush

HAS NO EQUAL.

Satisfaction guaranteed or no pay.

... Write us for full information ...

ELDER & DUNLAP,
Bloomington, Ill.

Standard Dry and Wet Pans

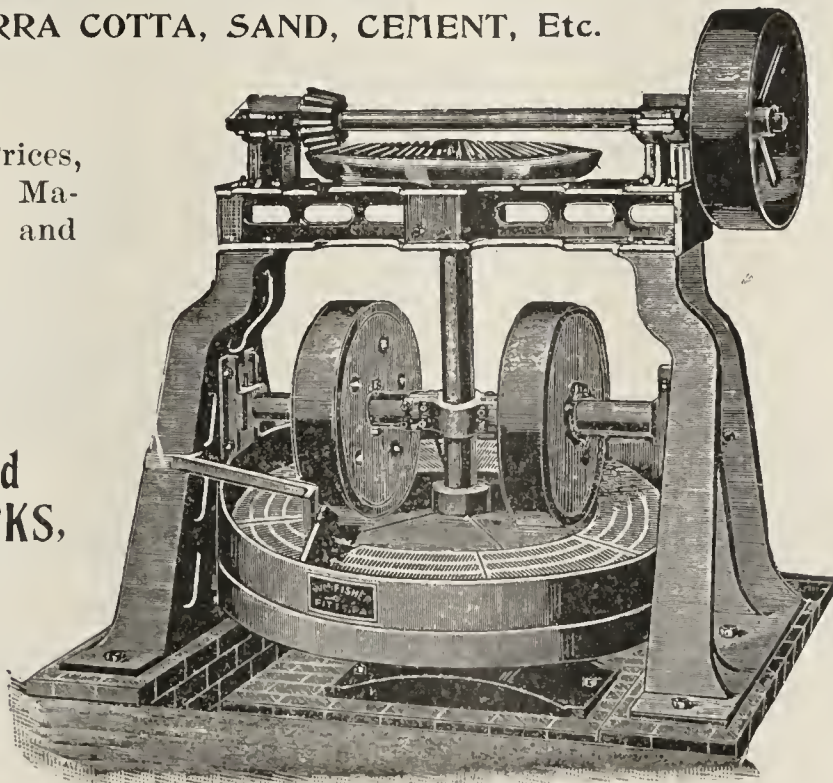
For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

FISHER ENGINE FOUNDRY and MACHINE WORKS,

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
Clarksburg, W. Va.

6 tf d

FOR SALE—Brick and tile factory; in operation now; manufactures tile in winter and brick in summer; has not shut down for 12 years, only for repairs; no competition; reasons for selling, patent kiln furnace to sell as per ad. on page 481.
F. E. SWIFT,
123 L Washington, Iowa.

FOR SALE.—One 8-ft under-geared iron frame wet pan; one 6-ft iron frame wet pan; one new 5-ft pan for wood frame; one Potts stock brick machine; one Potts sanding machine; one 7-ft horizontal pug mill; two vertical pug mills; large lot of steel and iron pallets; 20 pallet cars; lot of brick barrows, molds, etc. Address,
THOS. CARLIN'S SONS,
11 12 c Allegheny, Pa.

FOR SALE—At your own price; one Penfield & Son Horizontal Stock Brick machine, new never used; one Jonathan Creager & Son Grand Automatic Stock Brick machine used 90 days, good as new; one Adrian brick stiff clay machine; four first-class friction hoisters; 65 double deck Walworth Run dry cars, new; two side-cutting tables; one 85-H. P. boiler and engine; two small boilers and engines; two 40-inch fans, new; lots of 2 15-16 shafting; big lot of doors and grates; one Raymond Hand repress, new; one mould sanding machine; 50,000 W. P. Pallets, new rack for the same.
CHERRYVALE VITRIFIED BRICK WORKS
123 d Cherryvale, Kan.

FOR SALE.—The best equipped Pressed Brick Plant in state of Ohio. Brick have a standard reputation. Finest bed of red and buff clay right at the works. Six down-draft kilns holding 800,000 brick. Daily capacity of presses 30,000. Steam dry house. Kilns have exhaust fan system whereby save about \$2000 per annum in fuel. Best coal \$1.00 per ton delivered at kilns. Cheap labor. Belt line R. R. connects with seven railroads including B. & O. and Pennsylvania system. Largest line of molded dies in the state. Will sell at a great bargain. Correspondence and inspection of plant solicited. Reason for selling, have to move to Colorado on account of health. It will pay you to look this plant over. Address,
11 dm LOCK BOX 277, Zanesville, Ohio.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address
10 tf d SUPERINTENDENT,
Care Clay-Worker.

A BIG BARGAIN.

For sale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address
7 tf d WALLACE,
Care Clay-Worker.

FOR SALE.

3-ton Trenton Iron Co. Incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/2 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
1 Barr Pumping Company steam pump.
1 Chambers Bros. Company brick machine.
All new or little used, and in excellent condition.
1 tf d WALNUT,
Care Clay-Worker.

ENGLISH PLANS FOR PLASTIC BRICK WORKS.

Complete sets including general plan and elevation of works.
Plans and sections of machine room.
Plans for Dryer heated with waste gas from boiler.
Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.
Prices on application to
BENNETT & SAYER, Derby, England.

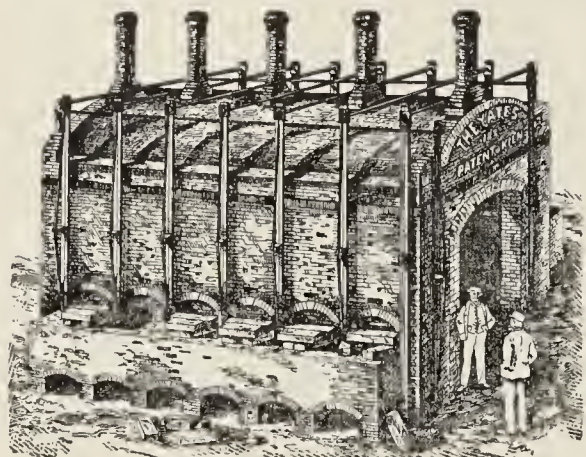
GABRIEL & SCHALLP. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated  Carbonate
of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.



For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES, Johnsonburg, Penn.

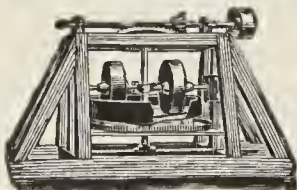
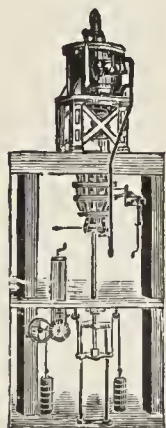
Steubenville Foundry and Machine Works.....ESTABLISHED
IN 1820

Manufacturers of

STEAM SEWER PIPE PRESSES

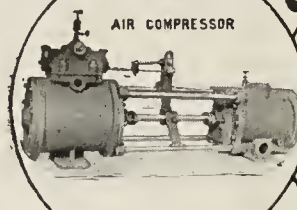
Of different sizes, making from 2 to 30-inch pipe inclusive.

Pipe, Brick, Tile, Coping, Fire Proofing and Building Block Dies.

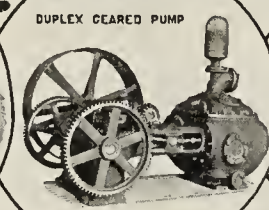
**CLAY GRINDING
AND TEMPERING
PANS AND PUG
MILLS.**

Feed Screws for Mining Clay; Steam Engines and every variety of Iron and Brass Castings, Shafting and Pulleys.

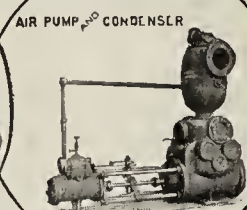
Send for circulars and estimates.

**JAS. MEANS & CO.,
Steubenville, Ohio.****DEAN BROS. STEAM PUMP WORKS.**

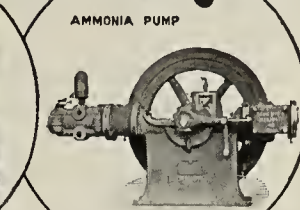
AIR COMPRESSOR



DUPLEX GEARED PUMP



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AMMONIA PUMP

PUMPING MACHINERY
FOR ALL PURPOSES**INDIANAPOLIS, IND.**SEND FOR CATALOGUE
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Clay Crushers.**

CLAY SCREENS AND ELEVATORS.

....

Eagle Iron Works,

Des Moines, Iowa.

**Roofing Tile
is Coming....**•➔• THE MACHINE TO MAKE
IT HAS ARRIVED.

A simple and very economical way of making Clay Shingles or Roofing Tile is found by using the machinery covered by recent patents granted to A. H. Murray and C. S. Welch. This industry is completely revolutionized by reducing the cost of manufacture to a nominal sum compared with the cost under the crude and expensive methods heretofore in use. This machinery is now ready for the market, and it has been thoroughly tested and is in practical operation to an extent that places it beyond a doubt of its practicability. Only territory east of the Mississippi river open. Correspondence solicited.

For full information address

MURRAY & WELCH, Huntington, W. Va.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chenoa, Ill.



GEO. S. COX'S
Ready Made
Cutting Wires,

Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

AN IMPROVED MUFFLED KILN

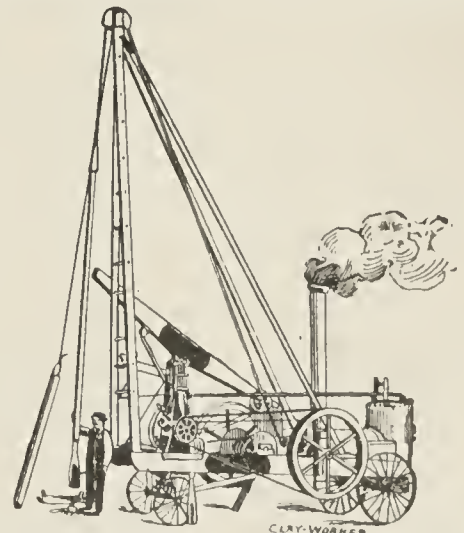
For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



THIS IS the best and cheapest kiln in the long run. It is guaranteed to do its work in a perfect and even way. There is no loss in burning with this kiln. Every piece put in comes out perfectly burned, whether set in top or bottom. We have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

F. HUNDT & CO.,
801 North Winchester Ave., Chicago, Ill.

W. R. Osborne,
Contractor for
Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.
Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

F. H. C. MEY,
Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

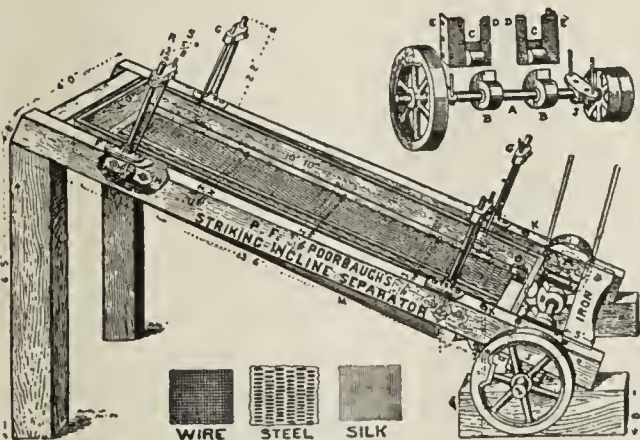
STRIKING INCLINE SCREEN

For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

• • • • •

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the



WIRE STEEL SILK

THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

PITTSBURG, PA.

A. F. TENNILLE'S

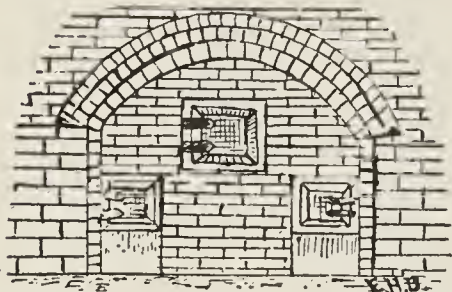
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Swift's Kiln Furnace,



F. E. SWIFT'S PATENT SLACK COAL COKER,
GAS GENERATOR AND SMOKE CONSUMER.

CAN BE ATTACHED to any kind or style
of Up or Down-Draft kiln. Nothing but
slack or waste coal
used from start to
finish of burn.



Fires not dis-
turbed but once in
10 hours till water-
smoke is off. Guar-
anteed to water-
smoke dry press
brick or the tender-
est of clays or ware
of any kind without
damage. These fur-
naces can be seen in
operation at my
works at all seasons
burning drain tile
in winter and brick
in Summer. It will
pay you to investi-
gate—I can save you good money.

For further particulars, address

F. E. SWIFT,
Washington, Iowa.

What do YOU know about
Bricks, Tiling, Pottery?

WE know ALL about
SPLENDID LOCATIONS

For the manufacturing of either of the above
along the lines of the

Cotton Belt Route.

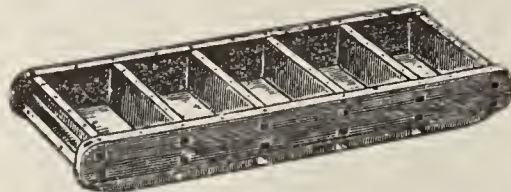
Splendid clays in abundance; Superior ship-
ping facilities to local markets in all directions;
and other inducements that will make it
worth your while to go in business on our
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For particulars write

J. St. KOSLOWSKY,
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MANUFACTURERS OF ALL KINDS AND SHAPES OF



HAND and....

MACHINE

MOULDS

We manufacture the the most substantial Moulds known,
and guarantee every Mould to be first-class
in material and workmanship.

A Special Discount on all orders received
on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

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CREDIT REPORTS on men who make BRICK, on men
who buy BRICK, on men who sell BRICK? Trust-
worthy service at lowest prices; ordinarily \$1.00 for
each report.

RELIABLE LIST of BRICK manufacturers and Supply
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Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,

ESTABLISHED NINE YEARS.

Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

Wellsburg, W. Va.

Fourteen (14) sold already this Season.

"LEVIATHAN."

"Upon Earth There is not His Like."



.....Sept1896.

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55 and 57 Market St., Chicago, Ill.

GENTLEMEN:—Please ship us via freight, 146
feet x 18" 8 ply "Leviathan" Belting. The rea-
son you have not heard from us of late is, we have
been trying the "just as good for less money"
belting. You can count on our future orders for
"LEVIATHAN." Prompt shipment of the above
will oblige. Yours very truly,

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE.—By our special process of treating
the material used in the manufacture of this
belting, the fibre is toughened, the elasticity is
preserved and the stretch reduced to a minimum.

MAIN BELTING COMPANY,
Sole Manufacturers LEVIATHAN BELTING,

55 and 57 Market St., CHICAGO, ILL.

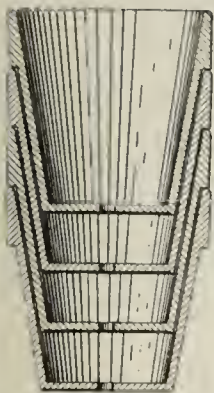
PHILADELPHIA: 1219 Carpenter Street.

BOSTON 120 Pearl Street.

FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
 44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

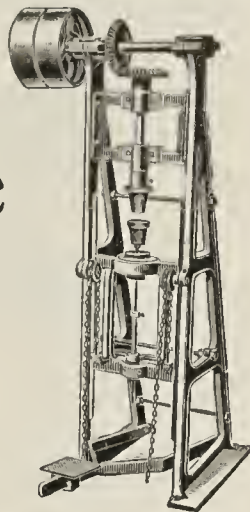
No expert workmen required.
 Capacity in 10 hours:
 6,000 two-inch Pots; 3,500 five-inch Pots;
 4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

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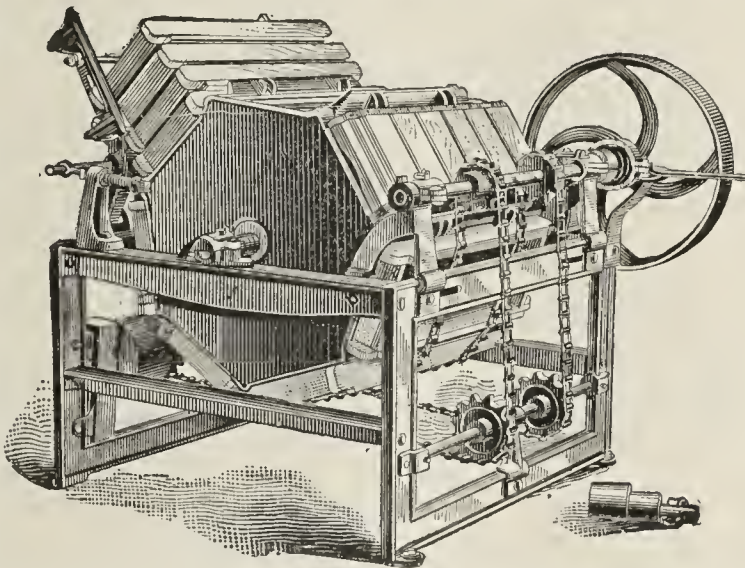


CHAMPION Brick Mould

SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

A. H. NEWTON,
 Manager and Sole Agent,
 HAVERSTRAW, N. Y.



THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.

Conveying, Elevating and... Power-Transmitting Machinery.

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For full information write the undersigned for a copy of the pamphlet entitled

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This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

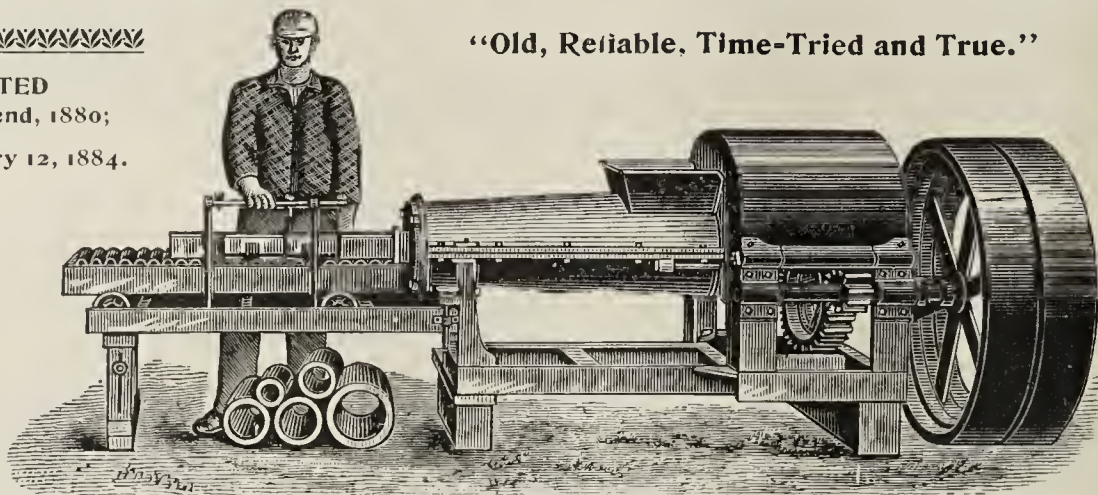
To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the North western States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED

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P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

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H. C. BAIRD & SON, PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

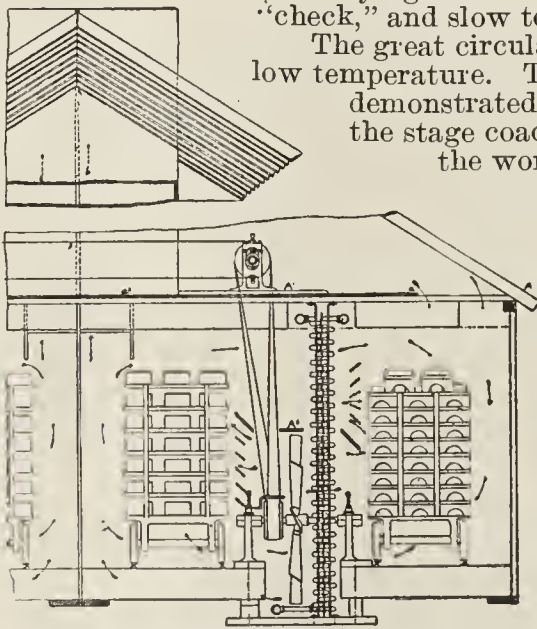
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Soft Mud Brick Dried in 10 or 12 hours.

Most trying service with large brick of tough clay that is liable to "check," and slow to dry.

The great circulation of air does it, as of out of door drying, at low temperature. The correct principle, successfully adapted and demonstrated. Saves more time than the locomotive over the stage coach; with fans and machinery, inside and close to the work, that pay well and cost no trouble to run, as users attest.

The fans save in cars, pipe and enclosure to make the first cost less than half that of other dryers, and in continuous use less than one-fourth of the fuel in using engine exhaust steam only for heating—much more of it, and without back pressure.



The INSIDE FAN DRYER.

U. S. Pat. Mar. 31, 1891. No. 449,170.
U. S. Pat. Mar. 31, 1891. No. 449,231.
British Pat. Mar. 31, 1891. No. 5,520.
Canadian Pat. May 30, 1892. No. 39,025.
Canadian Pat. May 30, 1892. No. 39,026.

You have the best drier in the market and I purpose in the near future to put in another two track section. Wishing you success, I am

Yours truly,
JOHN W. FRID.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,

CHAMBERS BROTHERS Co.

J. H. CHAMBERS, Gen'l Mgr.

306 Hannah St., West, Hamilton, Ont. Can. }
July 10th, 1897. }

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Dear Sir:—I am pleased to reply that your little 12 feet x 54 feet, two track, drier has been in use by me since May 15th, 1897 and works remarkably well.

Our clay takes from six to eight days to dry on yard pallets and three or four days in a neighboring drier, yet the six or seven thousand large soft mud brick it holds on 16 cars are easily dried in 10 or 12 hours in a superior and most economical manner because of heating with the engine exhaust steam only.

The endless belts drive the 10-60in. diameter (inside volume) fans easily not appearing to cost over 6 or 7 h. p. at 360 turns per minute to fairly make the wind blow.

Yours truly,
JOHN W. FRID.

S. G. PHILLIPS.

Agent and
Patentee,

161 Grand Street.

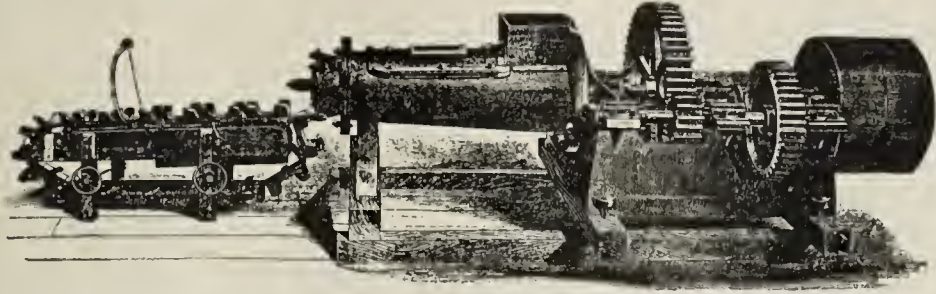
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Successors to NOLAN, MADDEN & CO.,

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No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

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BRICK,
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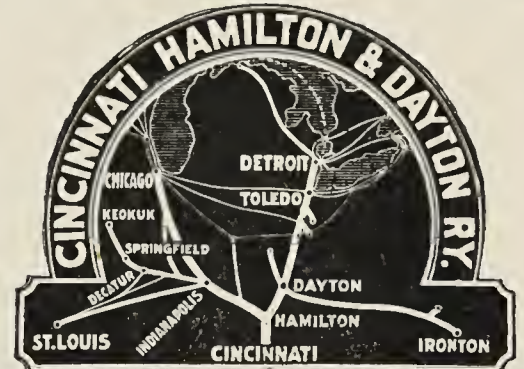
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Accommodation.....	3.45 p m
Fast Express.....	11.10 p m

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As a Trial, we will send Express Prepaid, (boxed, no marks),
Five Quart Bottles of ten-year-old (Spring 1888)

Sheldon Rye Whiskey for \$5. Money returned if not perfectly satisfactory.

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TAKE THE
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The "New South" Brick Machinery

Built for Business.

Has won over a number of others, in actual service, in the past. We expect to make it continue to win in the future.

• • •

GREENVILLE, S. C., Sept. 23rd, 1897.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Since putting in your "Xtra" machine with automatic cutter I have the brick business of this city all to myself. I made 112 in one minute this morning, and can make 50 M any day of 11 hours. The bricks are dandies.

Yours very truly,

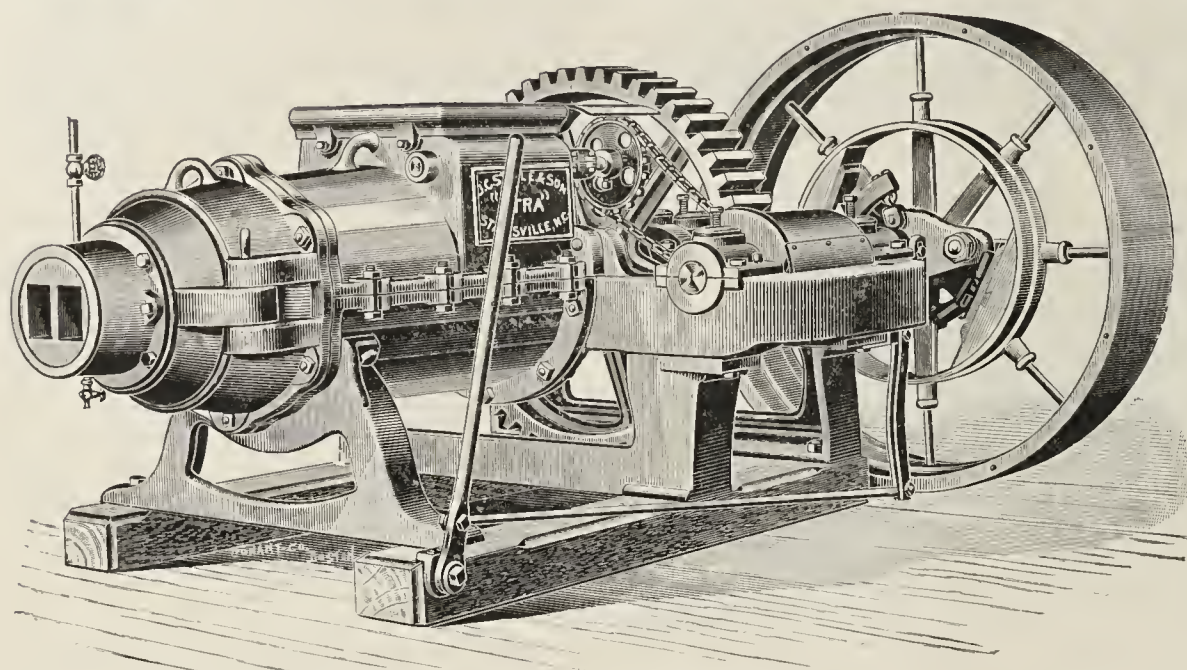
THOS. J. HANNON.

Mr. Hannon took out another machine that was almost new, and put in our "Xtra." We do not claim 50 M per day for this machine, but this is what our customers say that it will do.

• • •

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.



X-tra Machine. Capacity 25,000.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

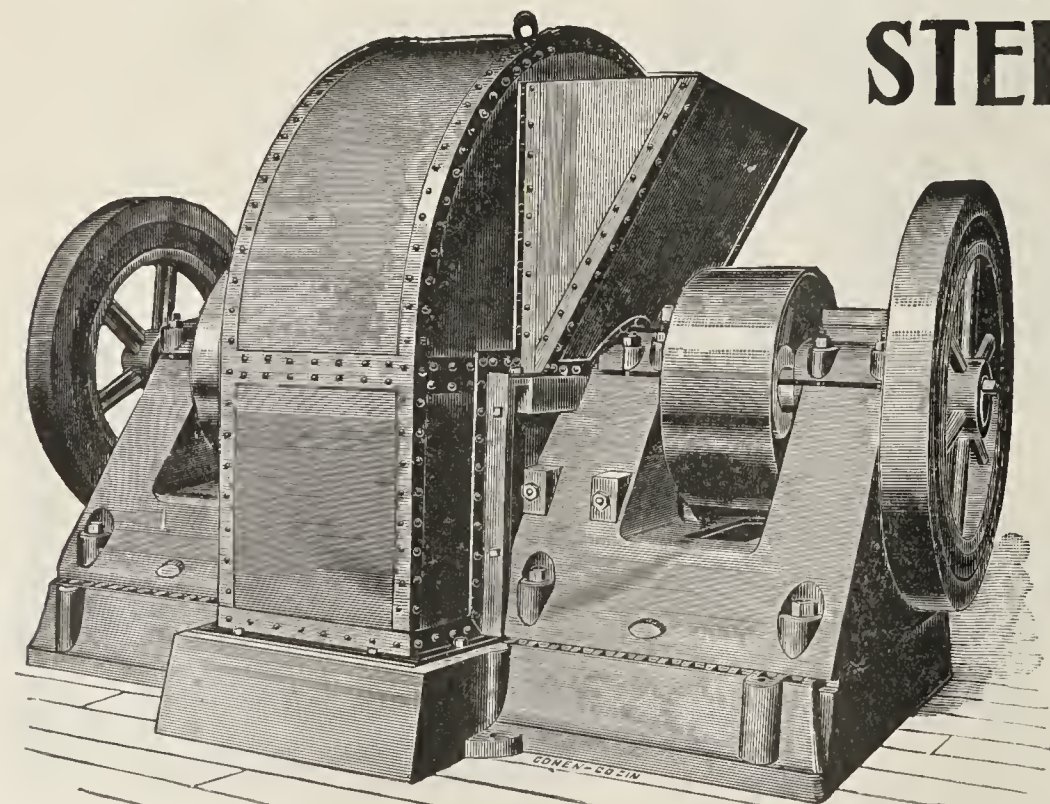
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

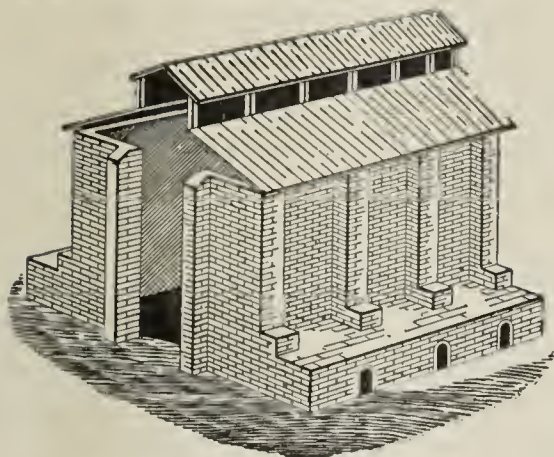
Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

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Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

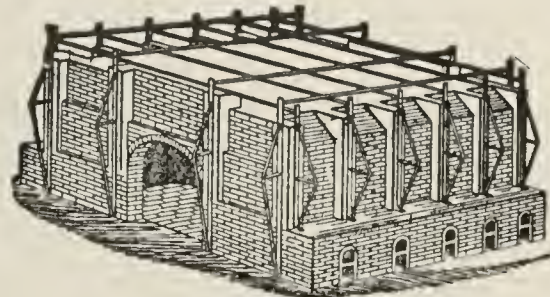
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S LATEST IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

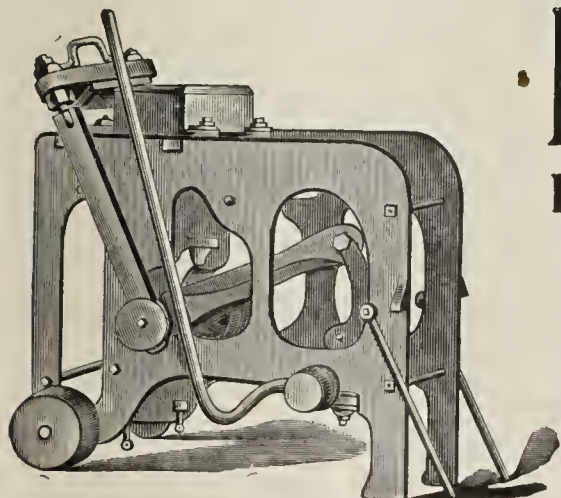
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

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RED BRICK PRESS.

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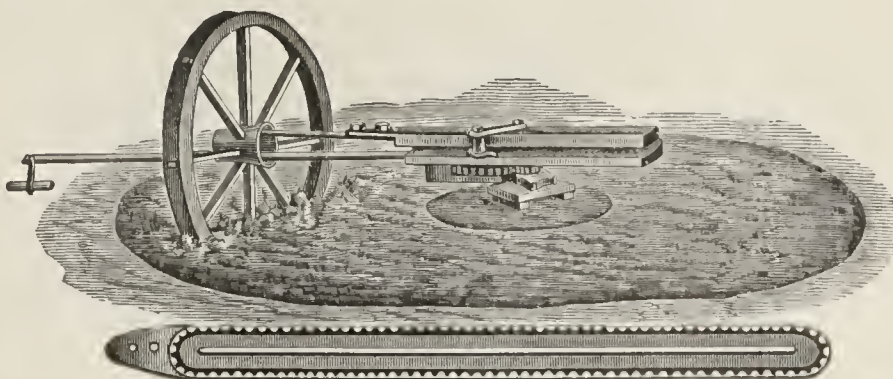
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PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

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These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

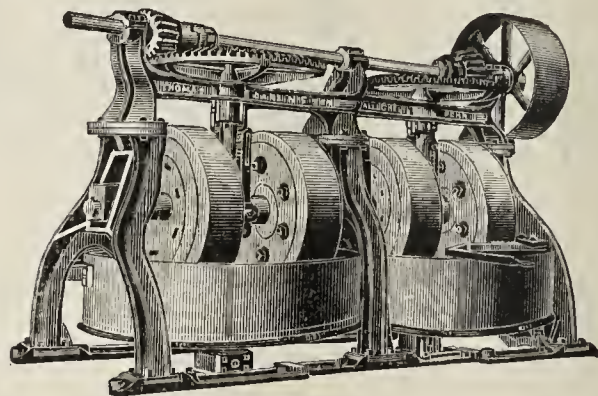
Send for Circular and Price-List.

Seeing is Believing...

WE WELCOME most heartily the members of the N. B. M. A. and their friends to Pittsburg. We will keep "open house" the week of the Convention and assure all who attend that it will afford us real pleasure to extend the glad hand to each and every visitor. Our office and ware house is at 186 to 190 Lacock Street, Allegheny City—but a few steps from the Butler St. Car line. Our Foundry, Machine and Boiler Works are at 380 to 396 River avenue and are among the largest and best equipped for the production of heavy, high-grade machinery of any in the country. We hope all who are interested in such matters will call and inspect our works and see for themselves the unsurpassed facilities we have for the manufacture of **Dry Pans, Wet Pans, Dump Cars, Clay Hoisting Machinery, Engines, etc., etc.**

Clayworkers know from experience that owing to the excessive wear and strain on this class of machinery that in the long run the best is the cheapest. **We make the best**—come and see us.

To those who can not attend the Convention we will cheerfully quote prices if they will let us know what they want.



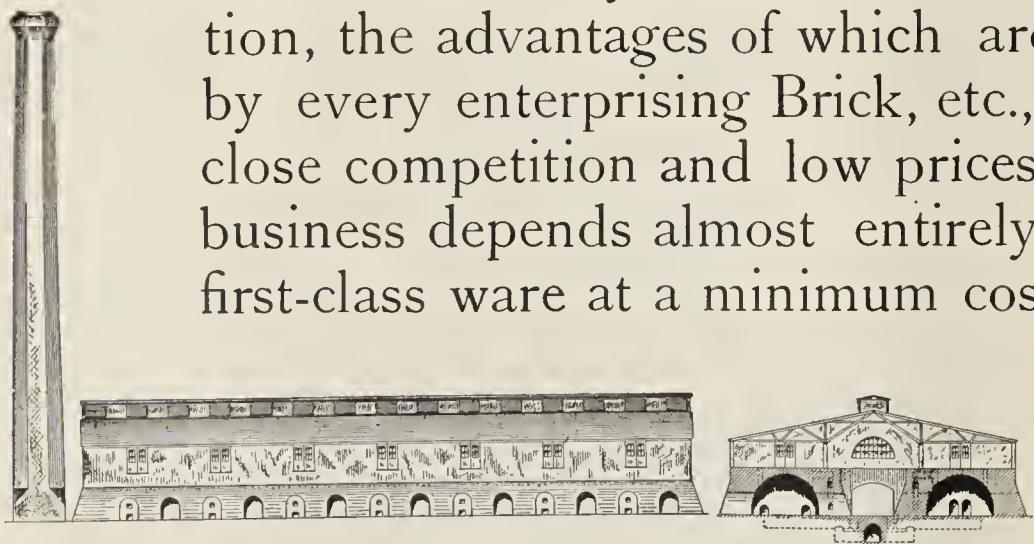
Thomas Carlins' Sons,
ALLEGHENY, PA.

HAIGH'S NEW SYSTEM OF KILN.

I want you to realize that this Continuous System of burning secures both the efficiency of the side firing down-draft or up-draft kilns, and the economy of the Continuous Kilns forming a combination, the advantages of which are well worthy of consideration by every enterprising Brick, etc., manufacturer. In these days of close competition and low prices, success in the brick making business depends almost entirely upon the ability to produce first-class ware at a minimum cost, and any improvement which

offers, as does this system of burning, a saving of 60 to 75 per cent. in the cost of burning of the product is by no

means an insignificant or unimportant one. Some of our largest Brick manufacturers are using them with the utmost success. Further particulars of which can be had from



H. HAIGH, Catskill, N. Y.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

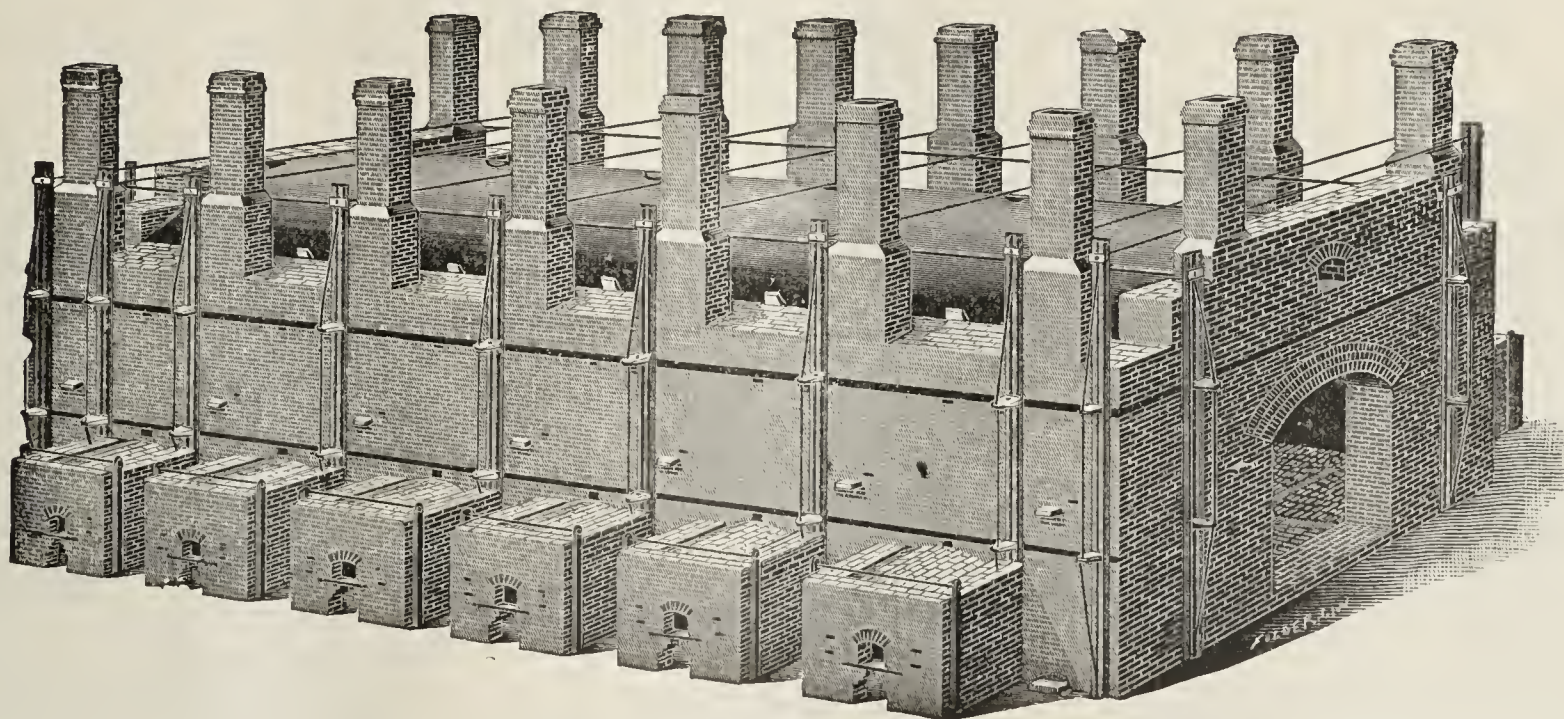
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

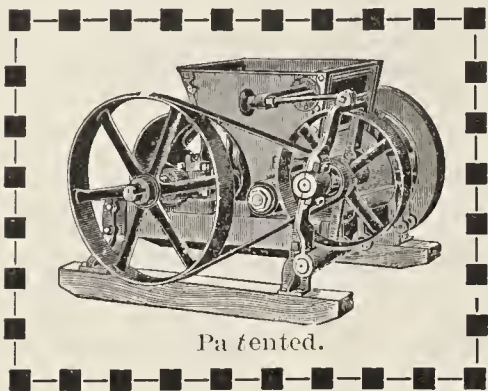
The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

The Potts Disintegrators

Simple in Construction, Strong and Durable.

Work any clay direct from bank. They will not choke or clog. They grind the small stone and separate the large ones.



Milledgeville, Ga., November 4, 1897.

C. & A. POTTS & CO., Indianapolis, Ind.

Gentlemen:—For ten year I used one of your old style Disintegrators, it did good work early this year I had it changed to the way you now make them and it is simply perfect. My son uses one of your Disintegrators and without it he could not make first-class brick out of the clay he has to use. Every brickmaker who has hard clay to work should put in one of your Disintegrators, it does all you claim for it.

Wishing you much success I am

Yours truly,

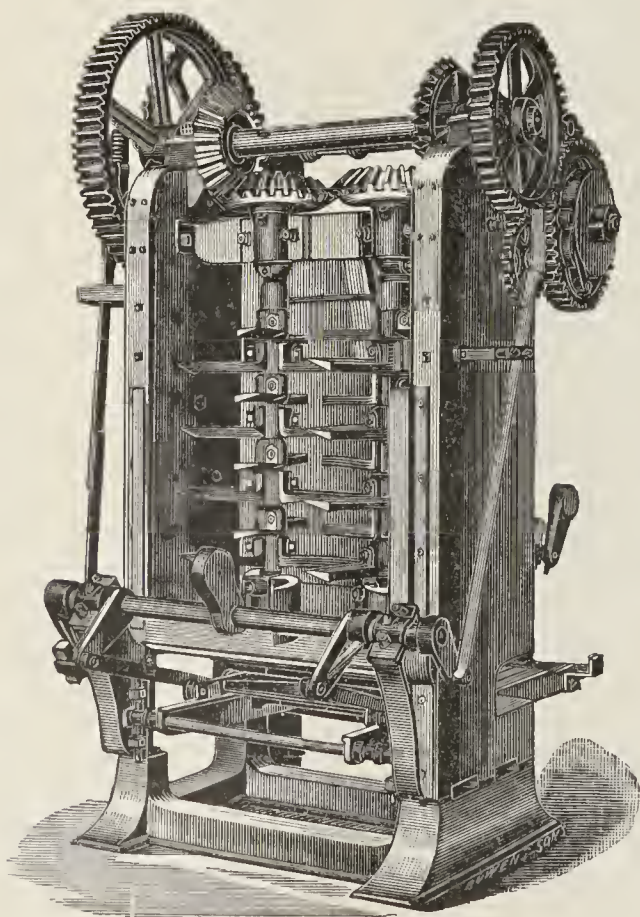
J. W. McMILLAN.

We manufacture 12 sizes of Disintegrators and can furnish any size promptly. We guarantee them to do as claimed or no sale.
Write for prices and terms.

C. & A. POTTS & CO., Indianapolis, Ind.

THE DUPLIX,

Is the Standard of all Soft Clay Brick Machines.



It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

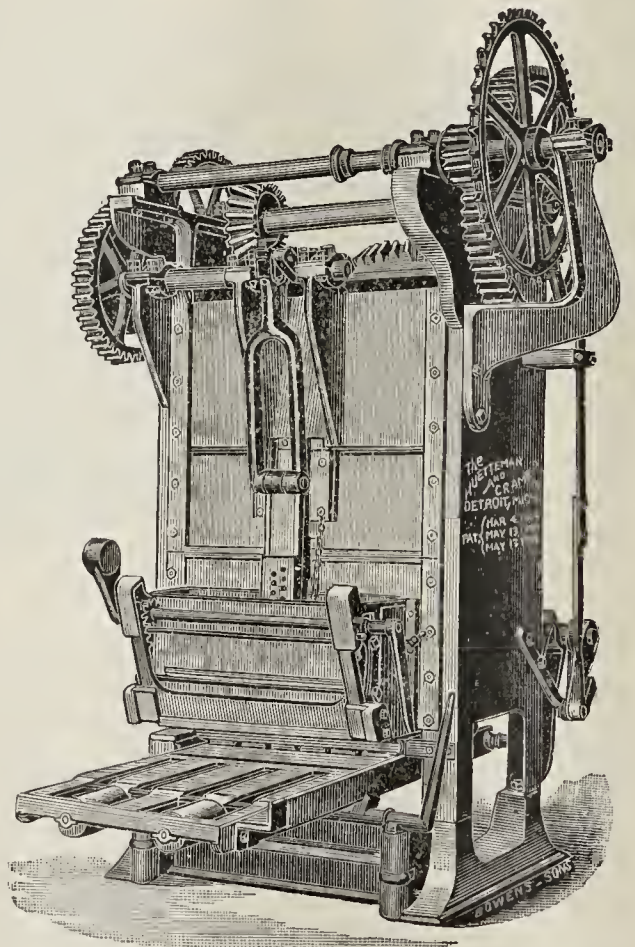
WRITE FOR CATALOGUE
AND PRICES TO

**The Huetteman
& Cramer Co.,**

Manufacturers of the Duplex Brick Machine and general outfit for
brickyards,

12, 14 & 16 Sherman St.,

DETROIT, - - MICH.



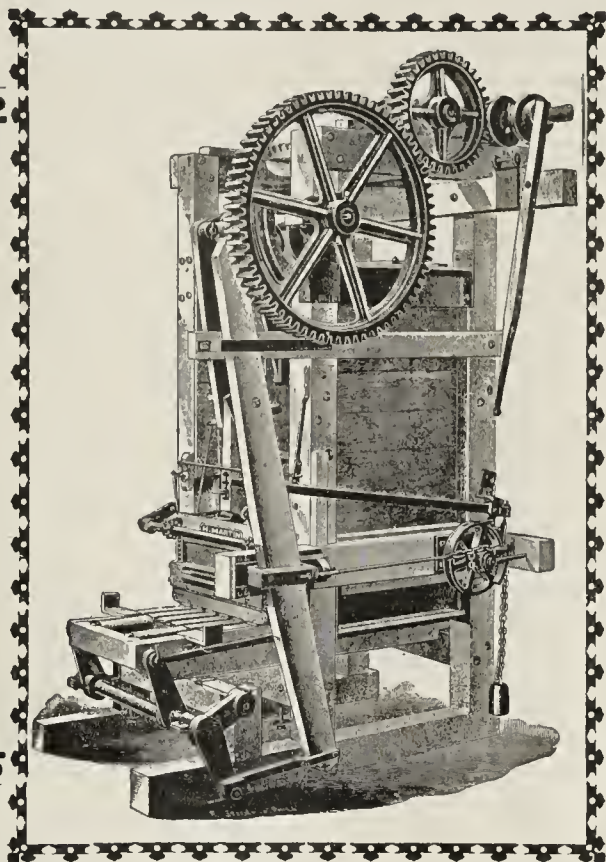
ARE YOU Going to the Convention at PITTSBURGH?

If so You will find that 75 MARTIN MACHINES have been sent to that vicinity.

MESSRS.

SANKEY BROTHERS,
LOCAL AGENTS.

No. 2101 Carson St.,
PITTSBURGH, PA.



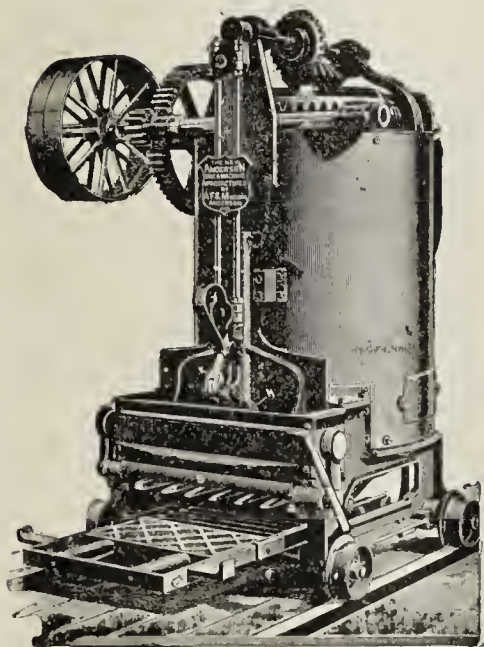
THE
Henry Martin
Brick Machine
Manufacturing Co.,
Lancaster,
Penn.

Manufacturers and Importers.

Write us for Illustrated Catalogue and Prices. We furnish everything a Brickyard needs.

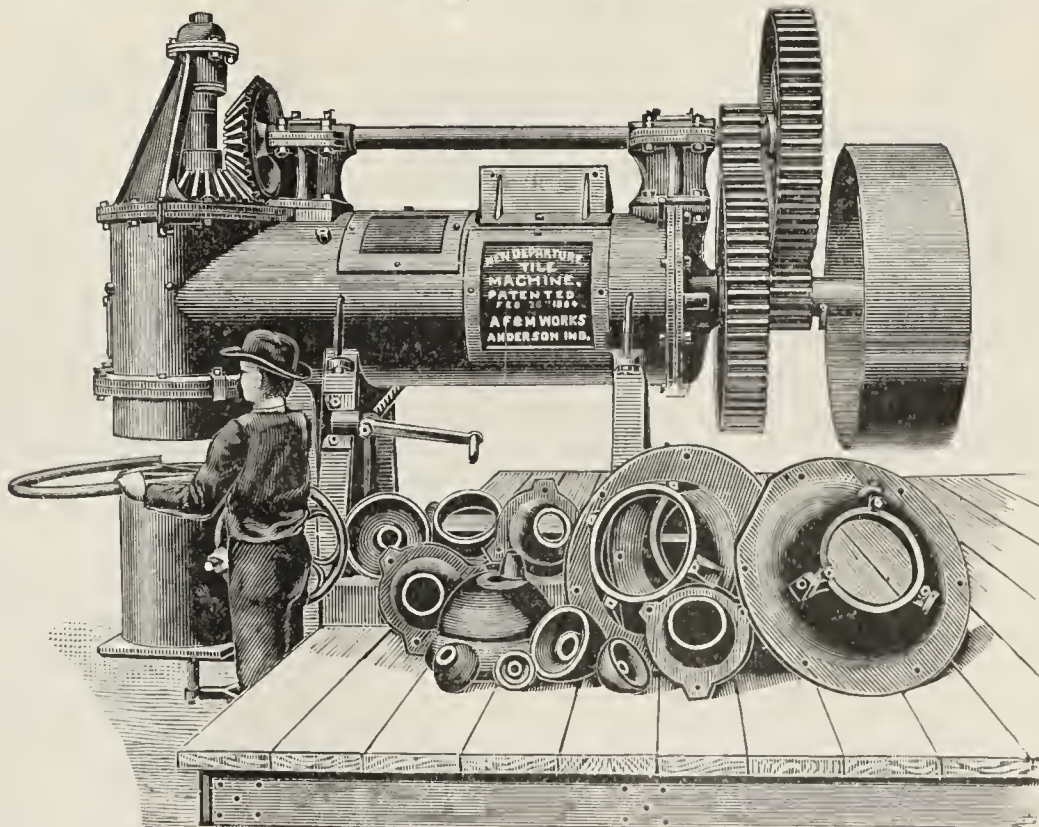
New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.

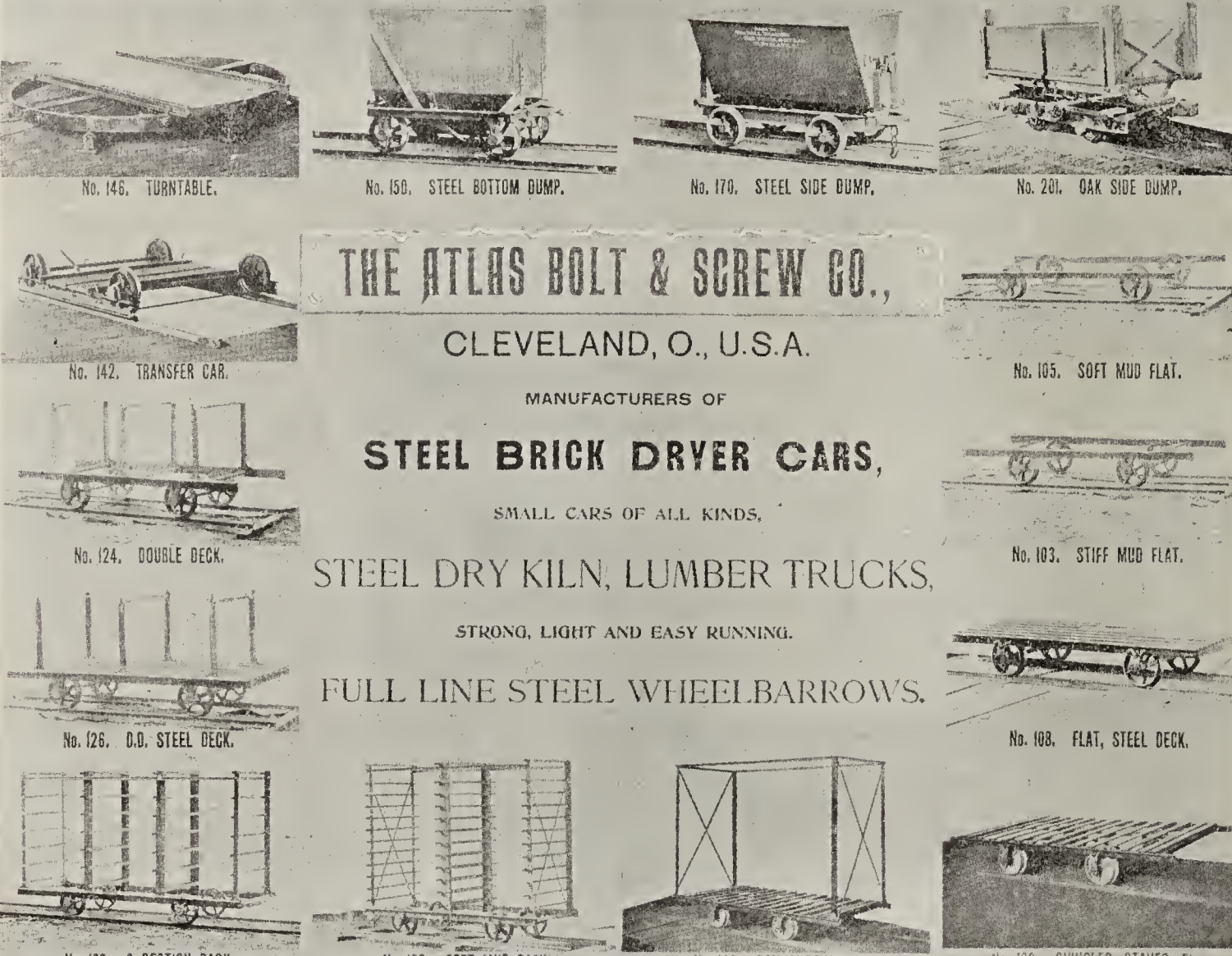


NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana



No. 146. TURNABLE.

No. 150. STEEL BOTTOM DUMP.

No. 170. STEEL SIDE DUMP.

No. 201. OAK SIDE DUMP.

No. 142. TRANSFER CAR.

No. 105. SOFT MUD FLAT.

No. 124. DOUBLE DECK.

No. 103. STIFF MUD FLAT.

No. 126. D.D. STEEL DECK.

No. 108. FLAT, STEEL DECK.

No. 136. 3 SECTION RACK.

No. 133. SOFT MUD RACK.

No. 140. BOX SHOCKS, Etc.

No. 139. SHINGLES, STAVES, Etc.

THE ATLAS BOLT & SCREW CO.,
CLEVELAND, O., U.S.A.

MANUFACTURERS OF

STEEL BRICK DRYER CARS,

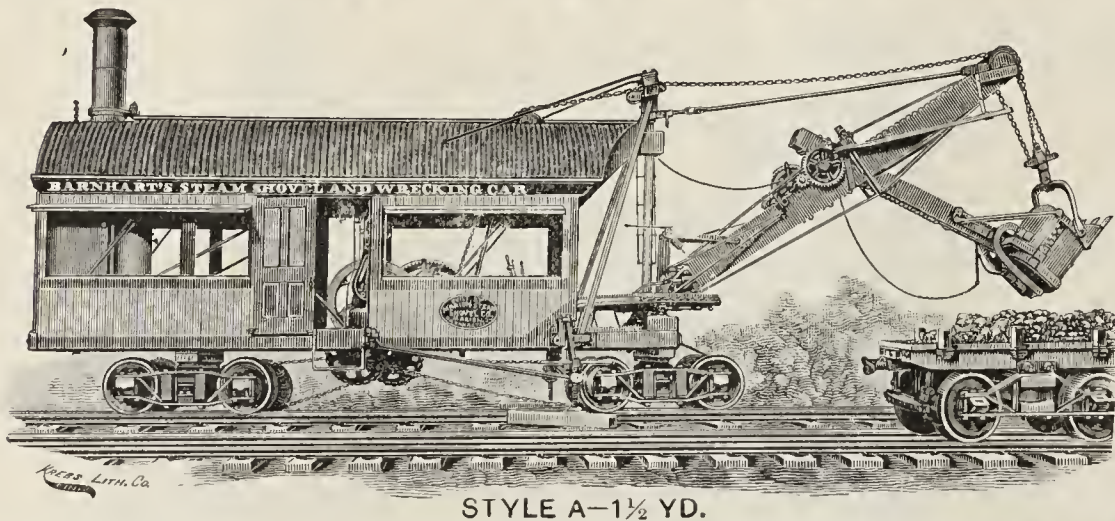
SMALL CARS OF ALL KINDS,

STEEL DRY KILN, LUMBER TRUCKS,

STRONG, LIGHT AND EASY RUNNING.

FULL LINE STEEL WHEELBARROWS.

Steam Shovels for Brickyards.

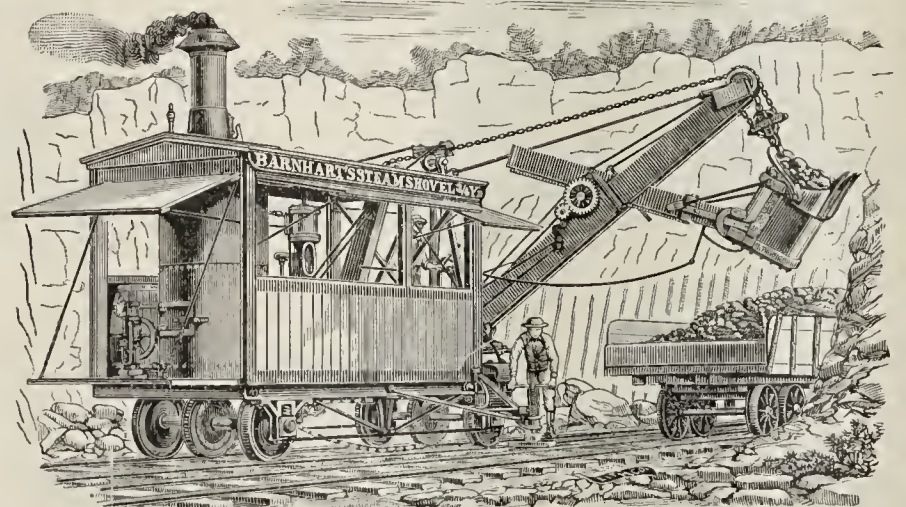


We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

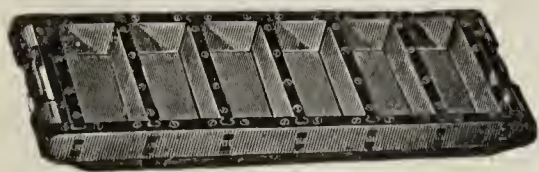
The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

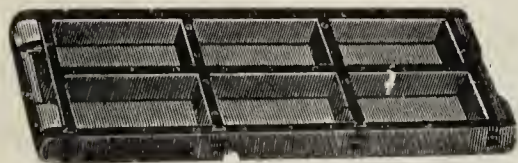


OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

DO YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

future delivery desired now. We make the best

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see?"

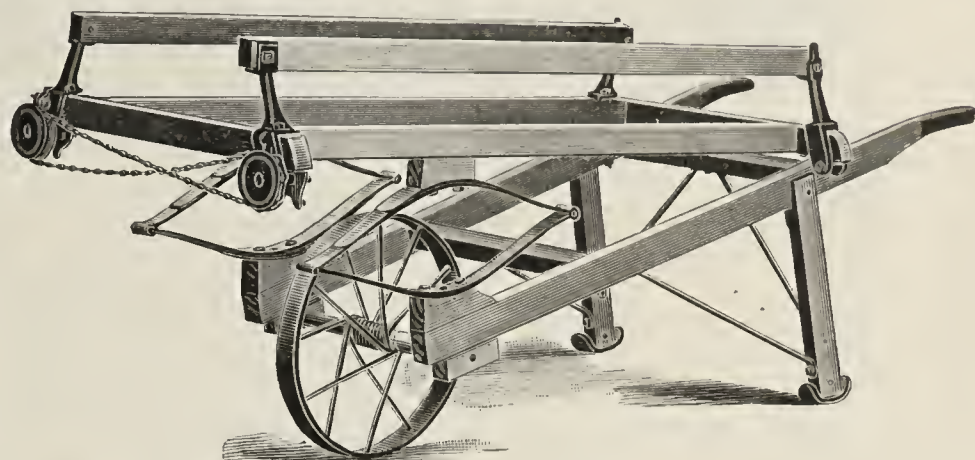
We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

•➔ Moulds, Trucks and Barrows,

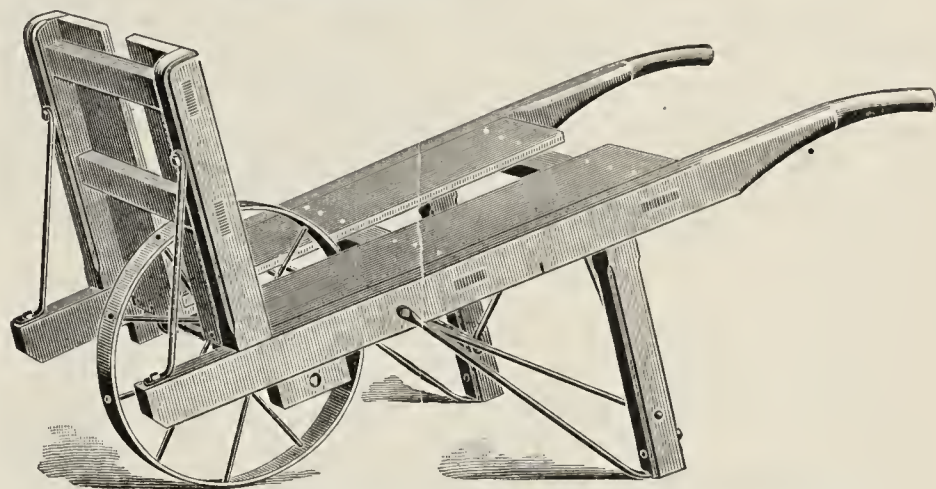
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



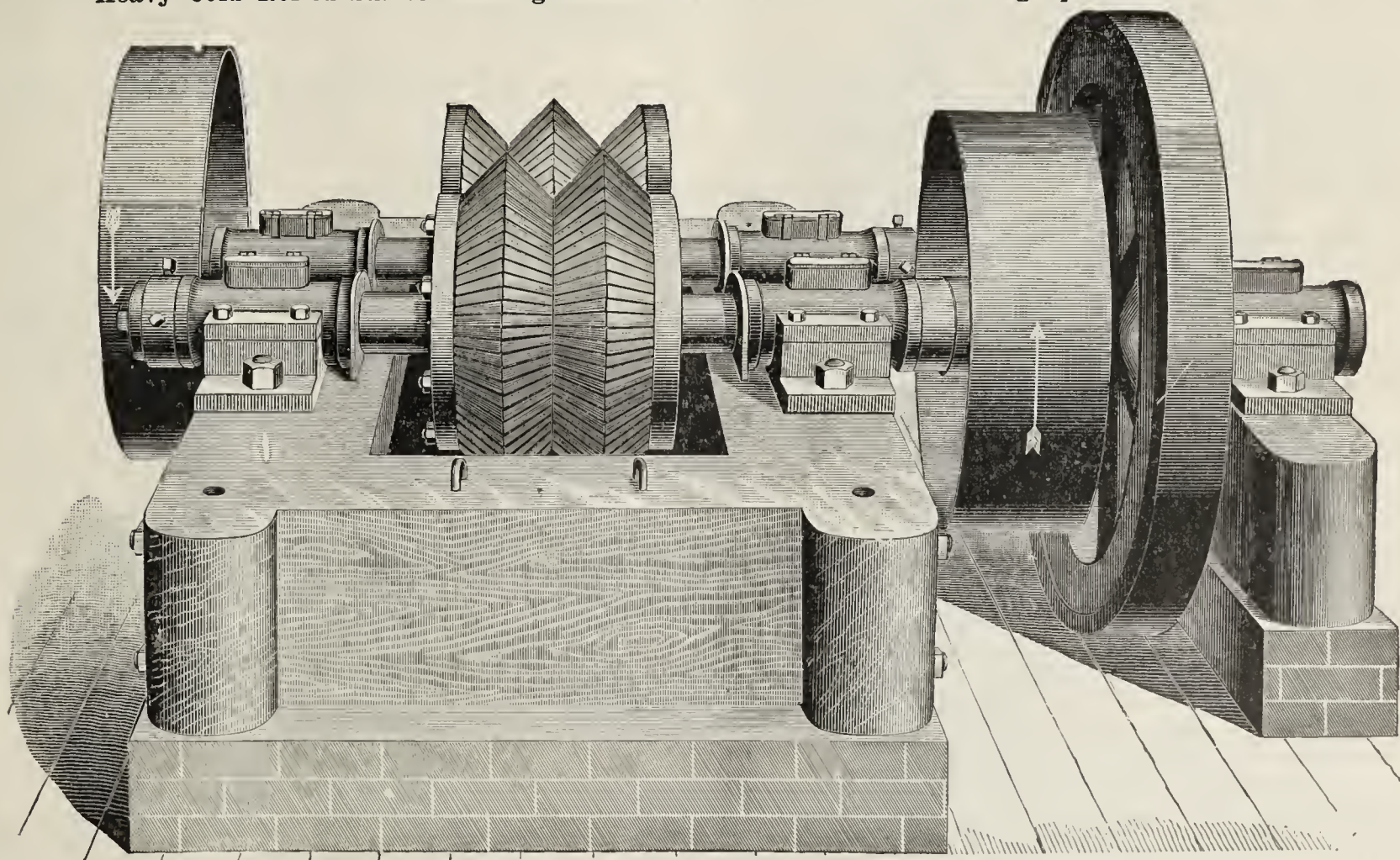
No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00 } For next 30 days.
No. 3 Same Barrow on Springs, " 6.25 }

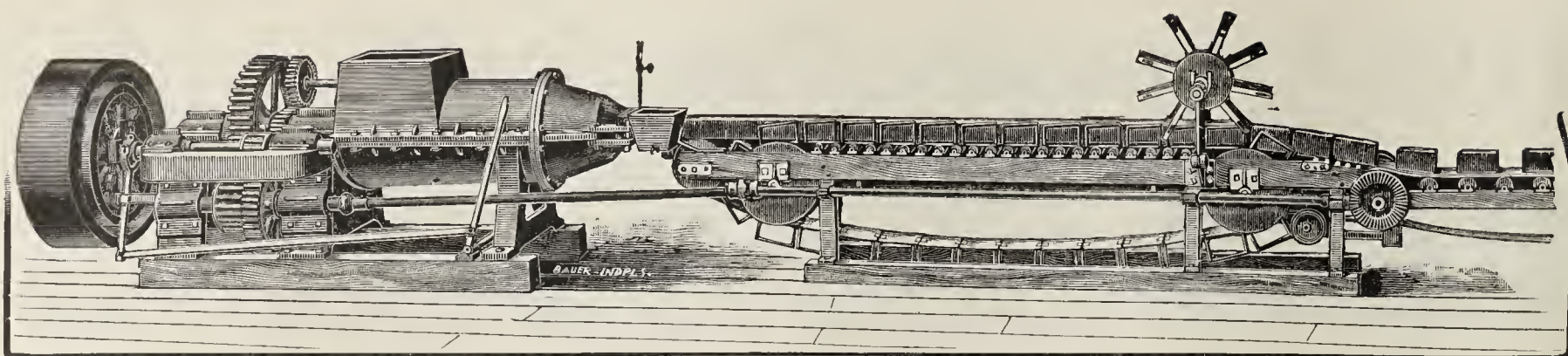
NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building, New York, U. S. A.
26 Cortland and 21 Dey Streets,



DANVILLE, ILLS, August 12th, 1897.

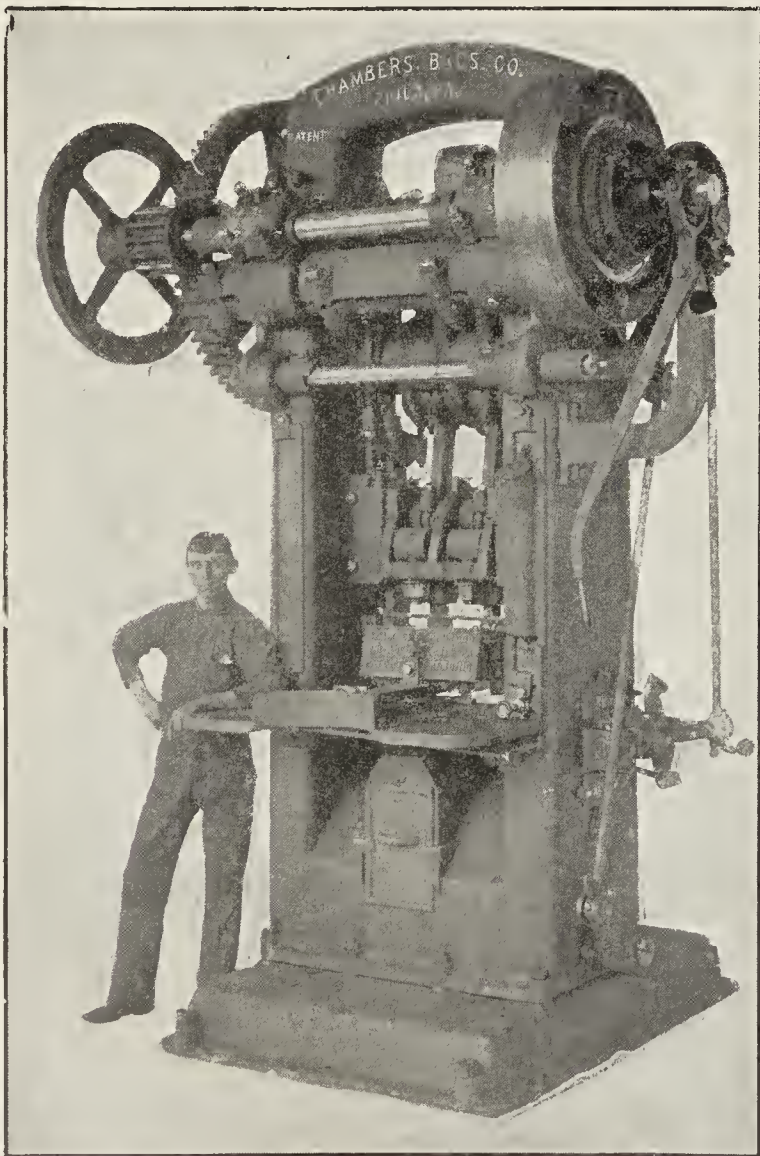
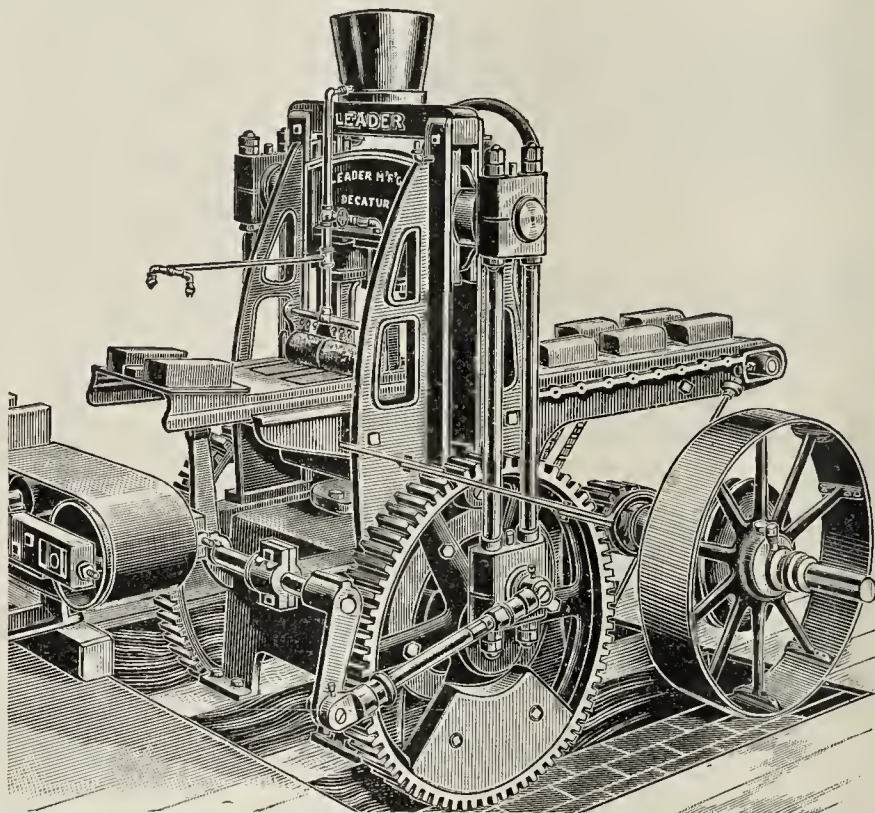
LEADER MFG. Co., Decatur, Ill.

Gentlemen:—We have been using two of your double power represses for nearly two years. Although the presses are in constant use (as we repress all of our product), we have had no trouble with them; both the quantity and quality of the work is entirely satisfactory. About three years ago we began with and used another make until we saw yours at work, when we substituted yours for the old ones, and we find we made a good investment. For strength durability and simplicity we think THE LEADER RE-PRESS has no equal.

Yours truly, DANVILLE BRICK AND TILE Co.,
J. G. SHEA, President.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

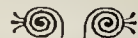
Leader Manufacturing Co.,
Decatur, Ill.



The Chambers Power Repress

...For Plastic Brick...

A STRONG, stiff, machine, with all the pressing machinery above the mould-box and away from the dirt. Steel-faced cams and hardened steel cam-rollers. Main shaft bearings made with long sleeves. Cross-head guides fitted with adjustable bronze gibs. The finished brick is delivered upon a plate, and is never touched by the incoming clot, which is placed in exact position and cannot be shaved. During the initial pressure any surplus clay in the clot is expelled, and all brick thus gauged to uniform thickness, following which all openings are closed and the finishing pressure applied in a practically tight box. The product is repressed, tempered clay brick, free from blemish arising from method of delivery, and of practically uniform density and thickness. The pressure applied to each brick can be regulated at will. **Weight about 14,000 pounds.**

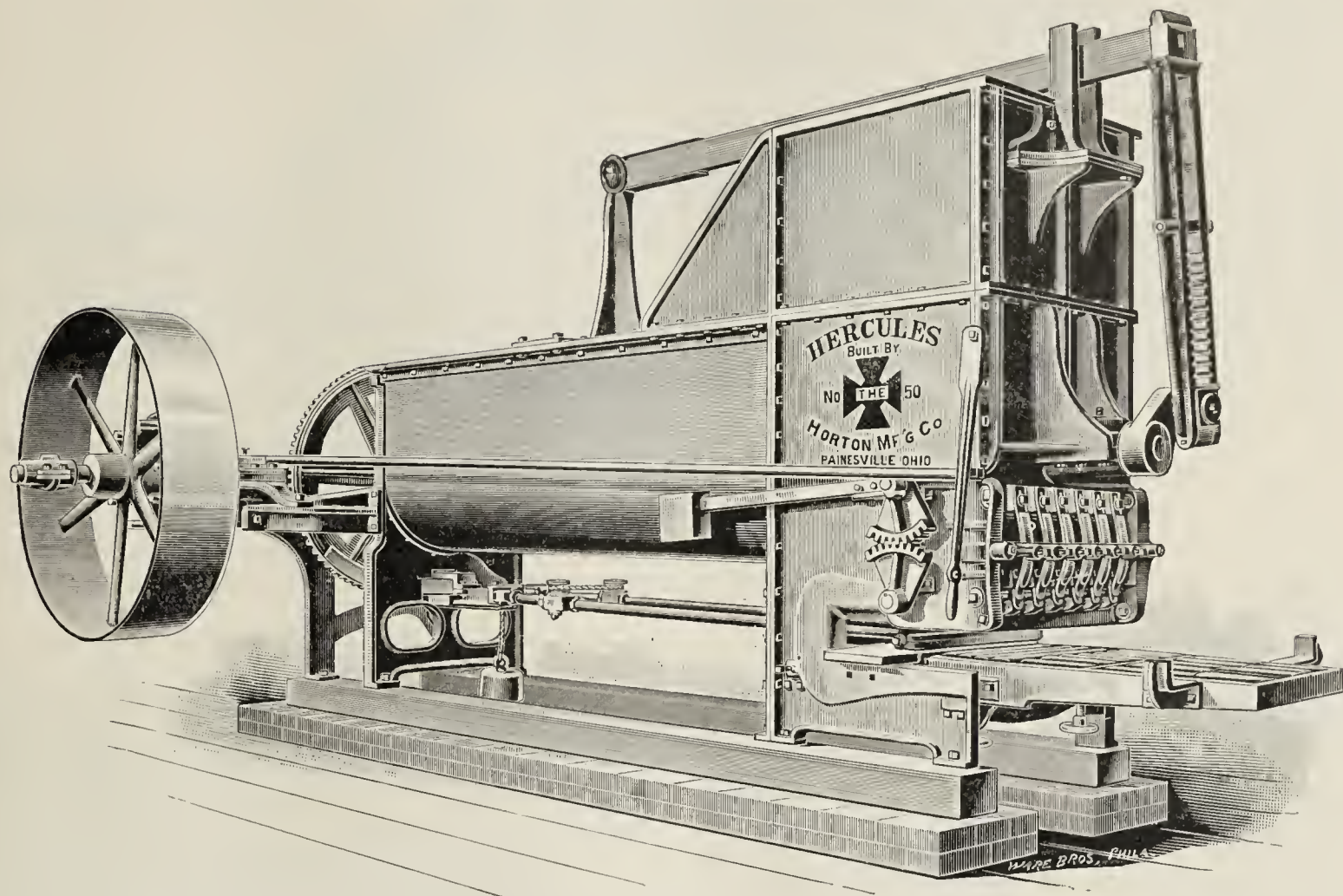


Manufactured by **Chambers Bros.' Co.**
Fifty-Second St. Philadelphia, Pa.
Below
Lancaster Avenue. U. S. A.

HERCULES.

As its Name Denotes Strength.

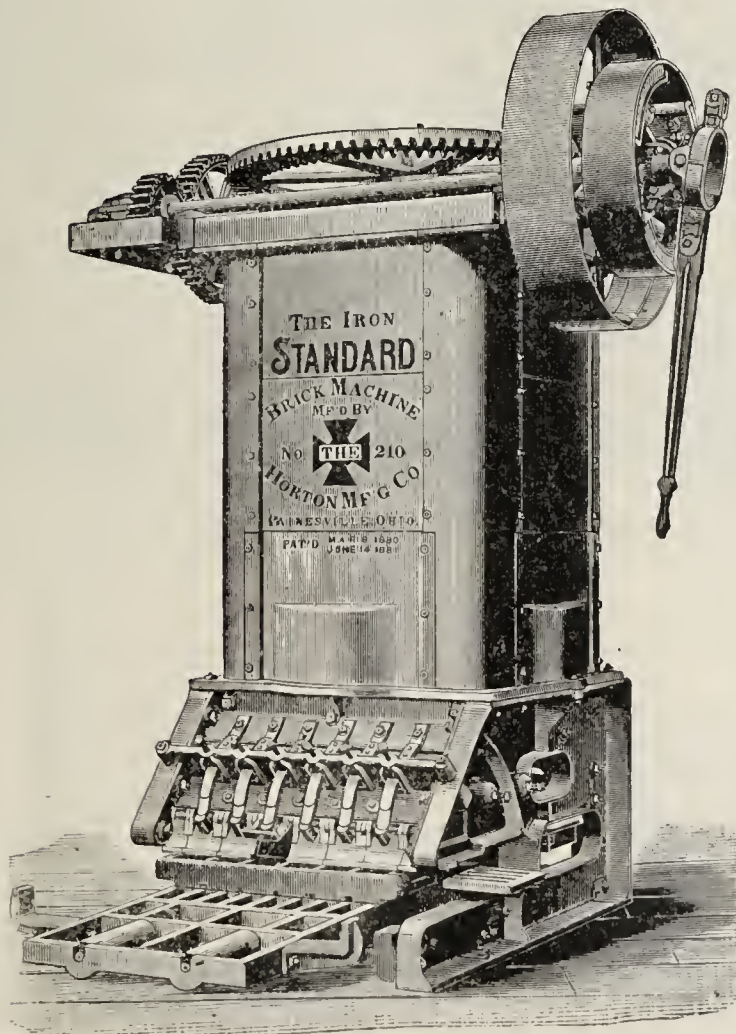
Capacity 40,000 to 50,000
Brick per Day.



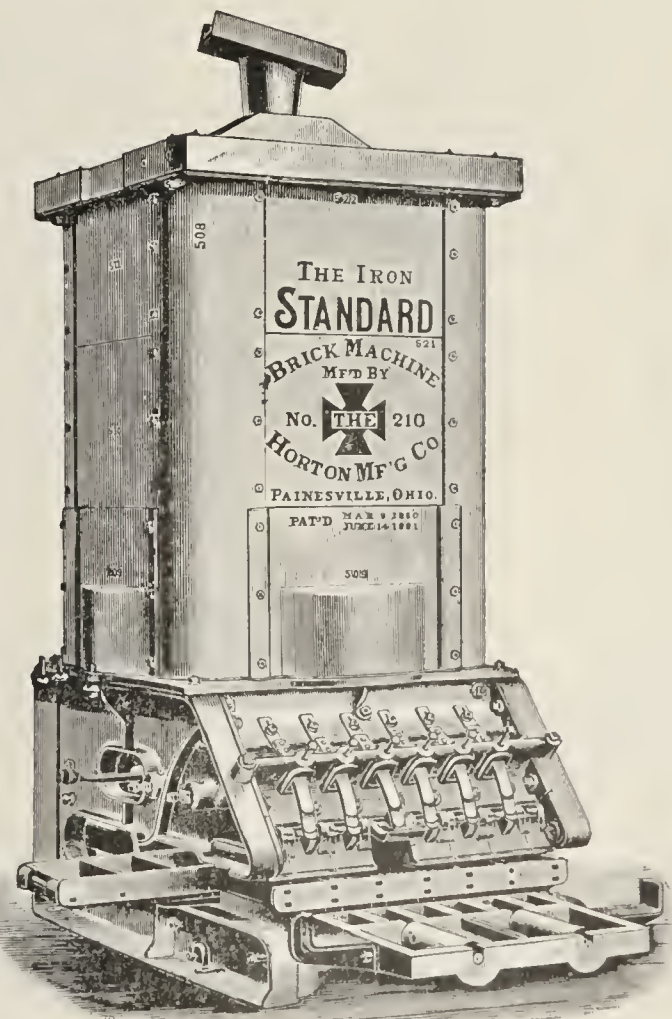
The Acme of Simplicity, Durability and Capacity.

Do not overlook the fact that this is the simplest machine in the field to-day. We can convince you of the superior merits of our machines in very short order; our illustrated '98 Catalogue gives full details. This machine is a new departure from all other Mold Machines. It is no Experiment, it has features that are found in no other machine built to-day. Do not adopt an out of date machine, write to us for catalogue giving full particulars.

Our Standard Machines.



Mold Sanders,
Disintegrators,
Hoisting Drums,
Pug Mills,
Wheel Barrows,
Dump Carts,
Clay Cars,
Elevators
And the best Mold in
the market.



The Horton
Manufacturing
Company,
PAINESVILLE, OHIO.

A Dry Subject...

But an important one to every Brick and Tile Manufacturer, is the "Dryer" question. It's the same with a dryer as it is with most anything else—a watch for instance—there's dozens of kinds, but you must take your choice. Who'd take a dollar watch if he wanted a good one? It might go for a while and do temporarily, but in the long run you'd find you had made a mistake.

Now, about the Dryer: We build them and sell them, but we don't stop at that; we see that they give satisfaction. Our Dryers will remove more moisture, in less time and with less fuel than any other dryer built. Why? Because they are scientifically constructed to use the steam to the greatest extent. Not an atom of steam or fuel goes to waste.

If you're interested, write us. We will send you our Special Dryer Catalogue for the asking, and will cheerfully answer all questions and refer you to people who are satisfied users of our Dryers. There are none who are not satisfied.

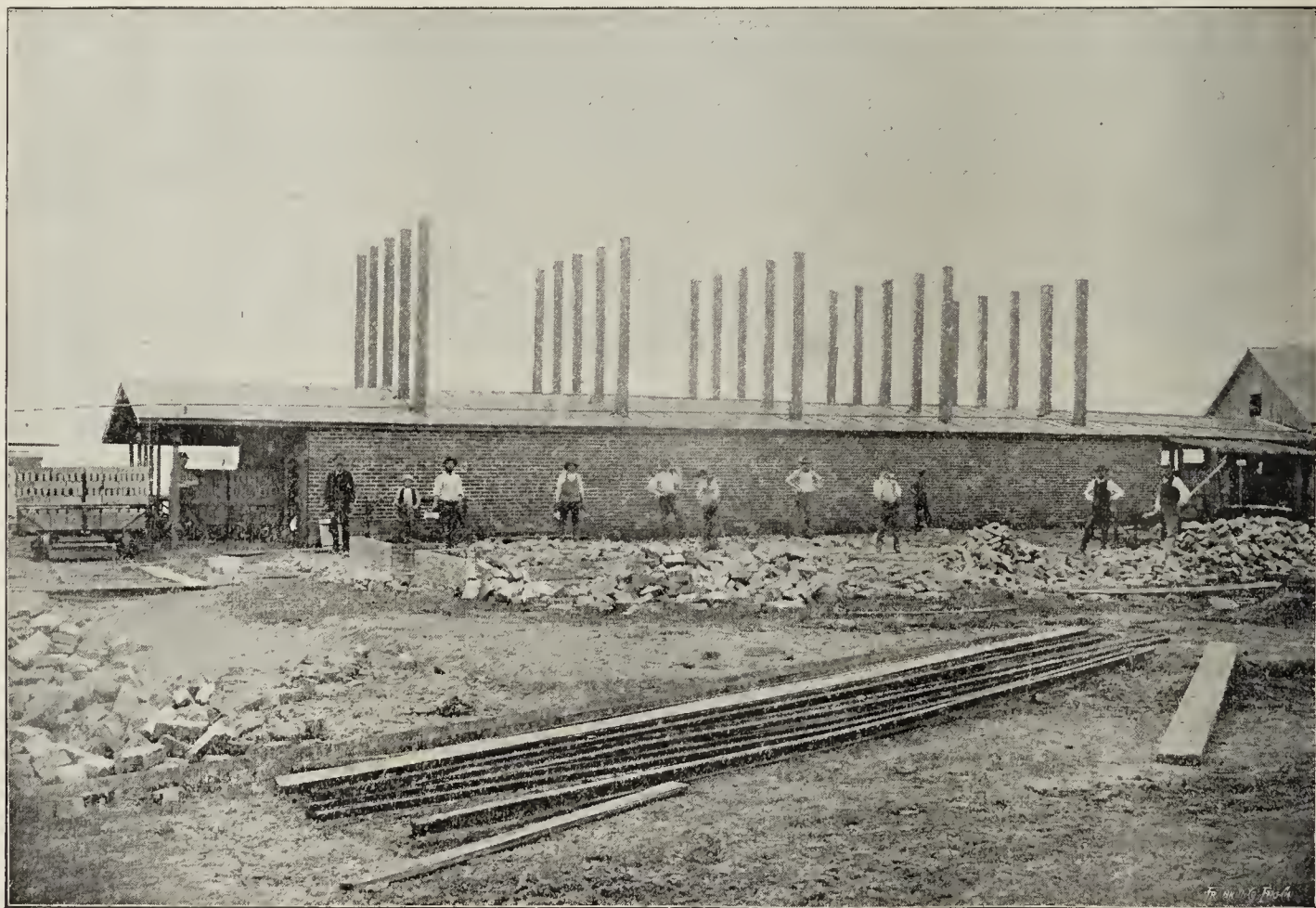
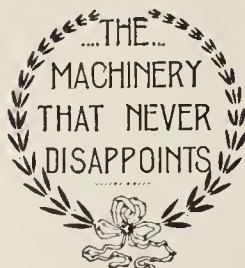
We Build

"The Dryer
that
DRIES,"

AND

A complete line
of Clay Working
Machinery.

SEND FOR COM-
PLETE CATALOGUE.

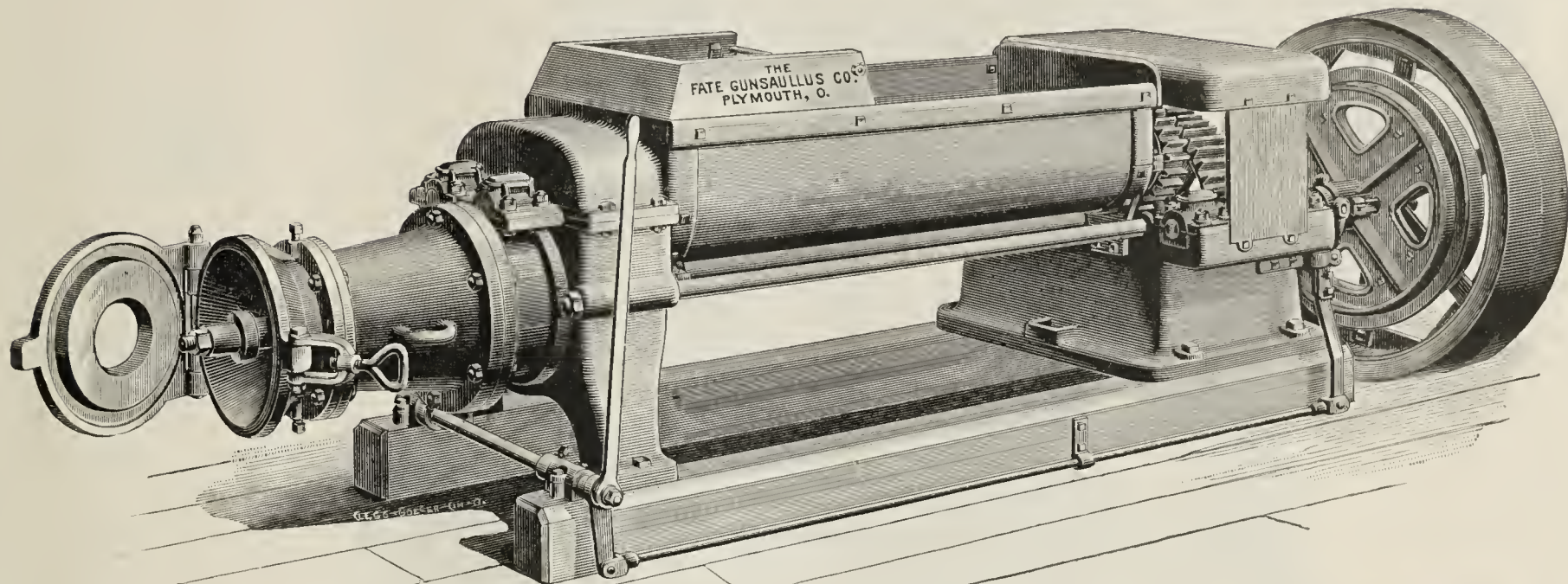


The American Clay- Working Machinery Co.,

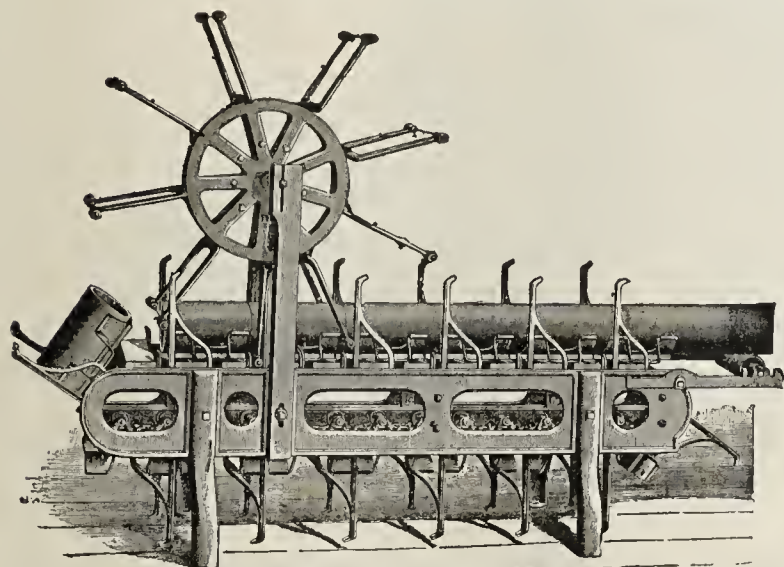
Long Distance 'Phone No. 90.

BUCYRUS, OHIO, U. S. A.

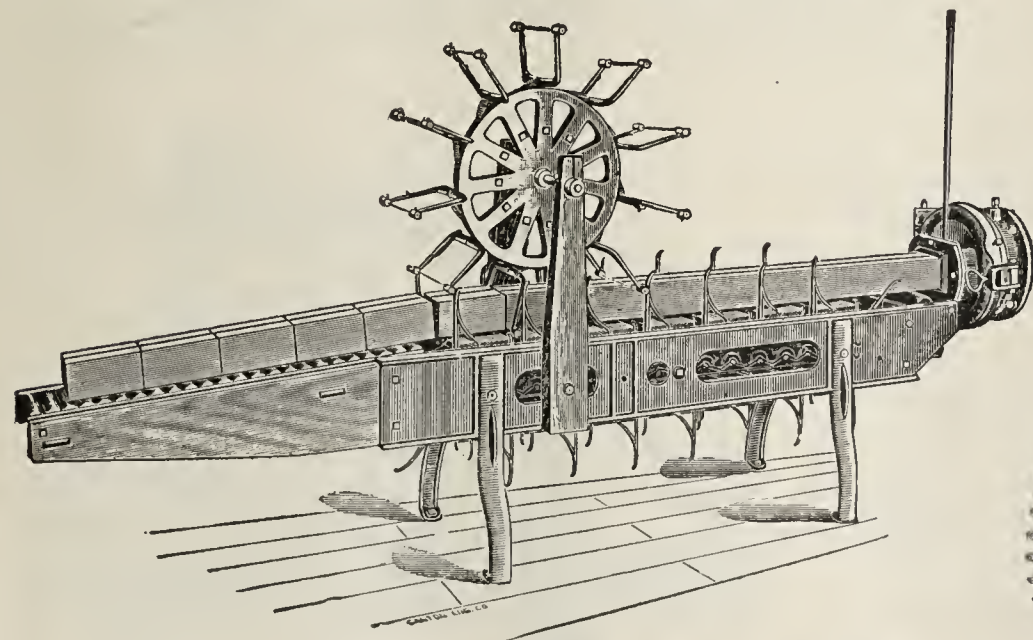
The "PLYMOUTH."



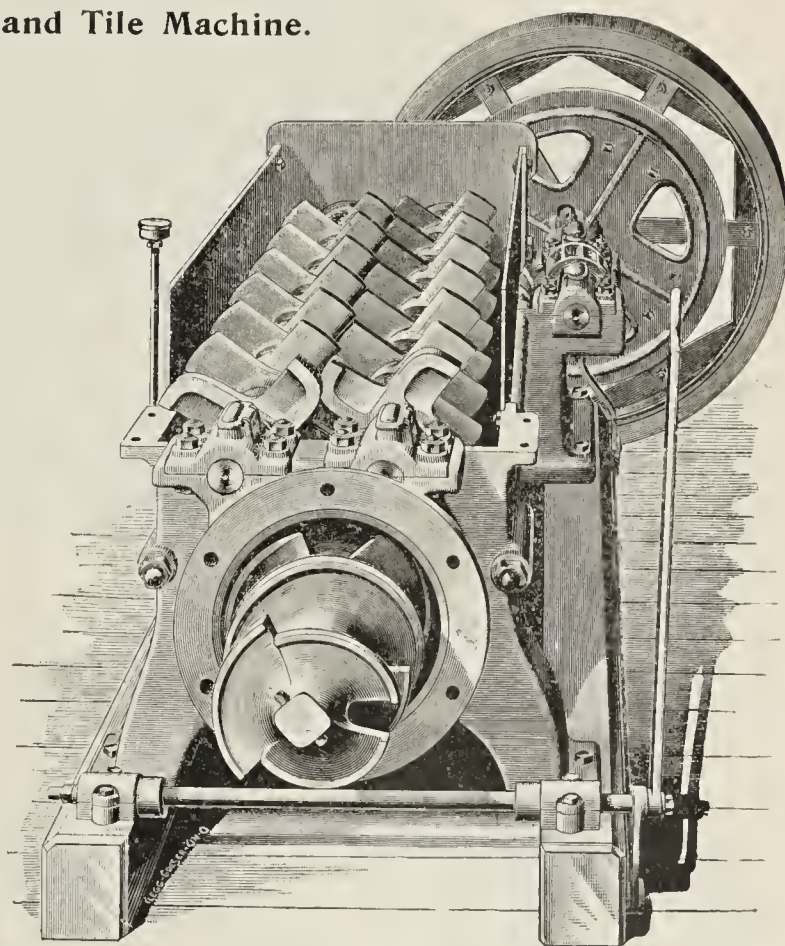
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



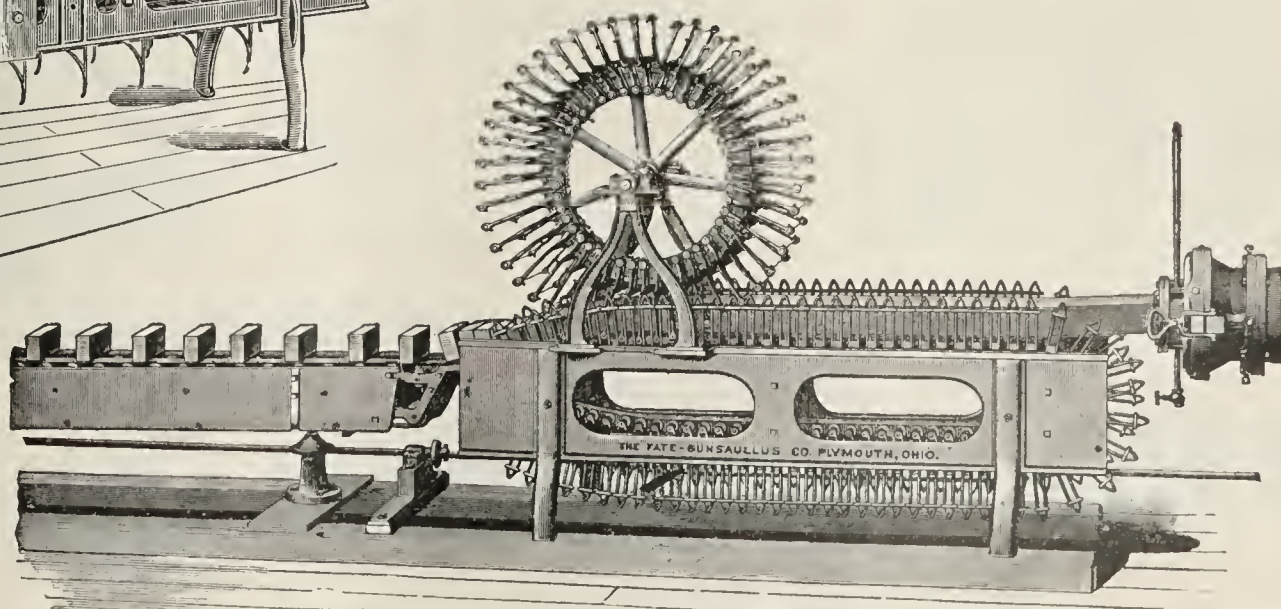
Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



Automatic End-Cut Brick Table.



"HUMMER" (Interior View.)

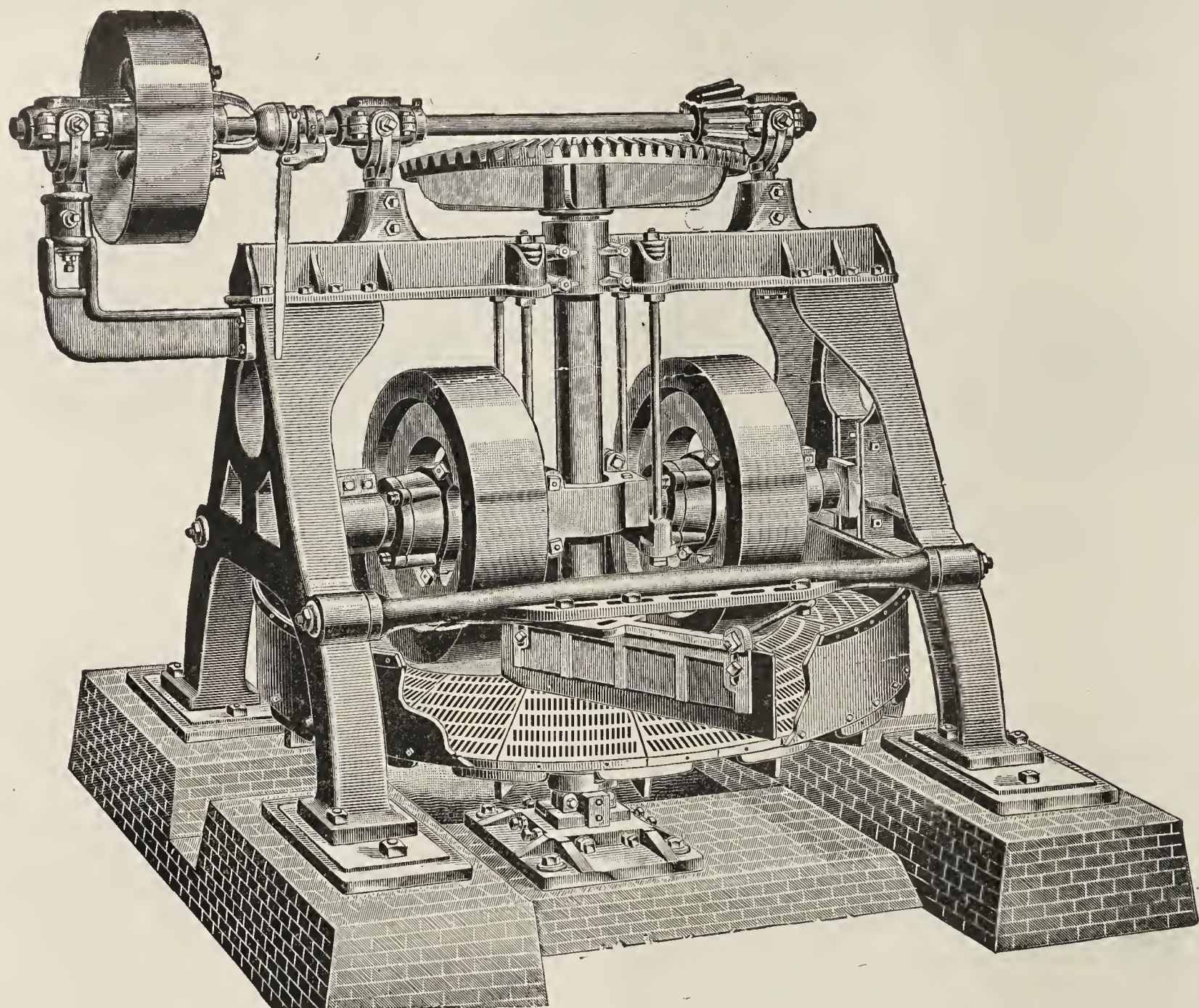


Automatic Side-Cut Brick Table.

Write for particulars to

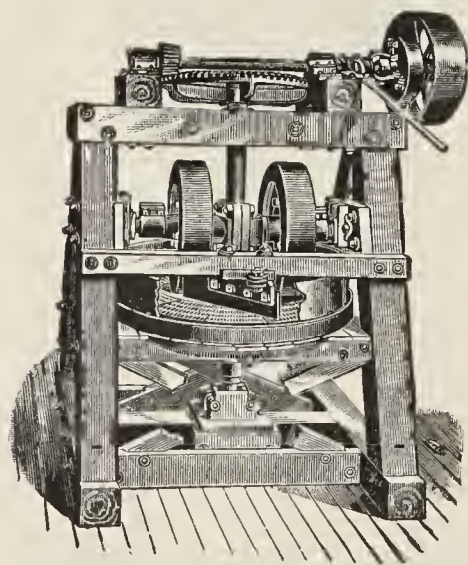
The Fate=
Gunsaulus Co.,

PLYMOUTH,
Richland County, OHIO.



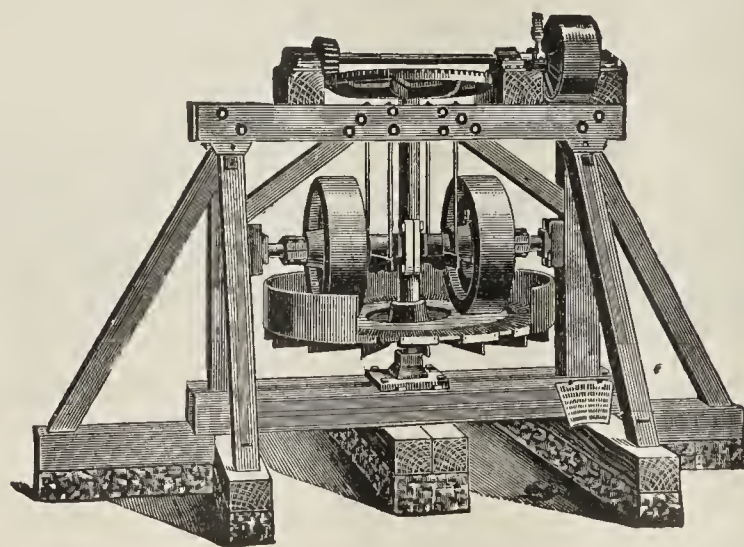
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~



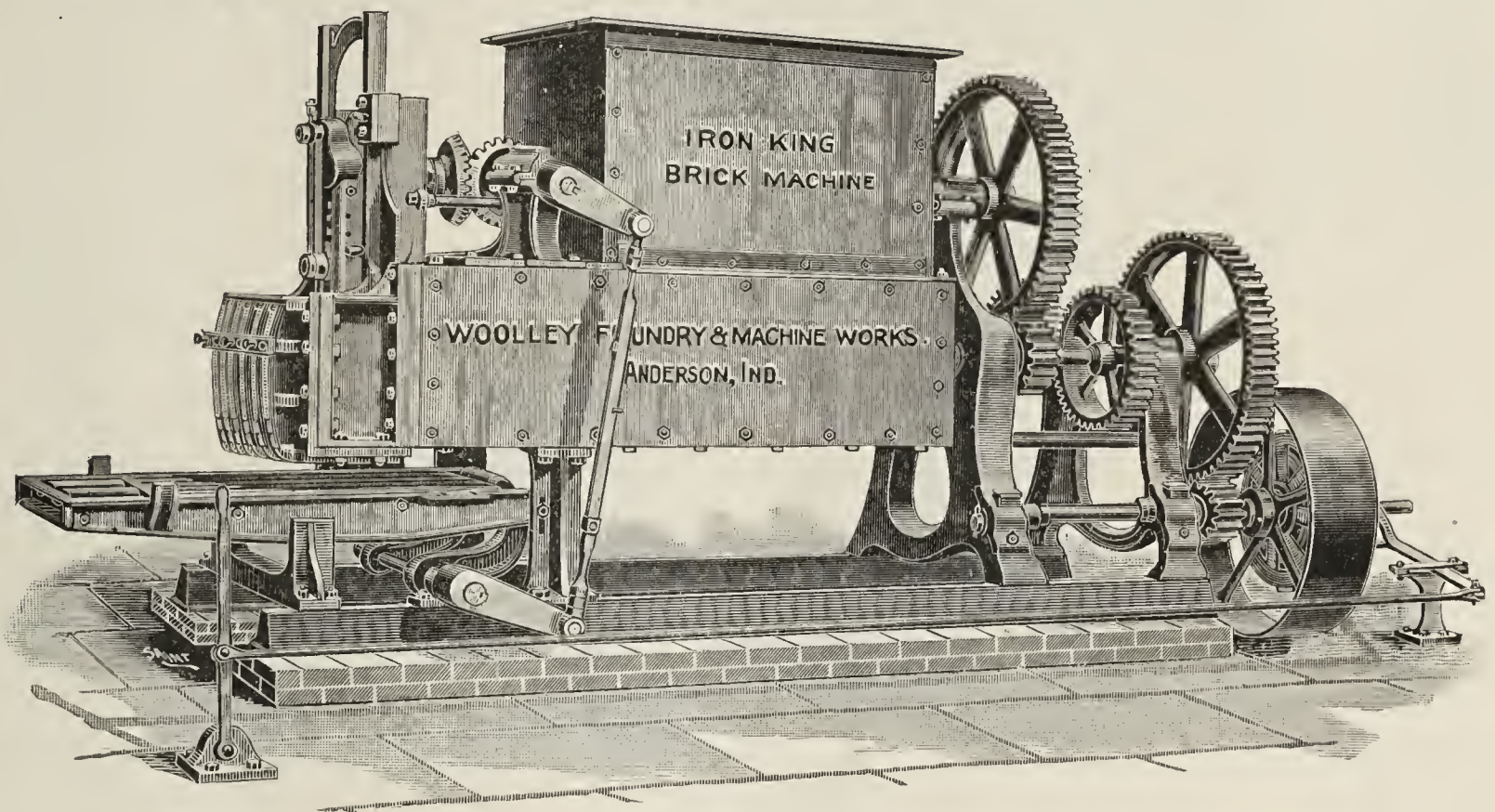
.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

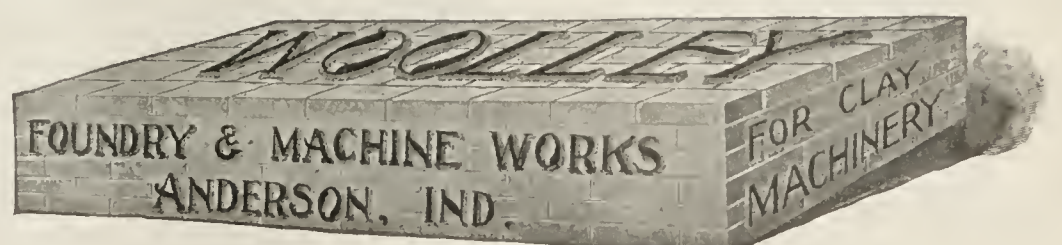
Our “IRON KING” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

WOOLLEY DRY PANS,
PUG MILLS,
SLIP PUMPS
and PRESSES

Are all made for hard service If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

Mention the Clay-Worker.



From Maine to California.

YORK CORNER, ME., October 25, 1897.

C. & A. POTTS & Co.:

Gentlemen—It give me pleasure to say the two Brick Machines, two mould sanders and two disintegrators I bought of you six years ago are all doing excellent work.

The two No. 4 Disintegrators I can not speak too highly of. They separate the stones, thoroughly disintegrate the clay, and do their work in every way satisfactorily.

The two brick machines make 45 M per day each. The bricks are perfect, as good as can be struck with mud. They are smooth, sharp corners, and struck stiff enough to retain size, while trucking off on pallets or put in racks.

The two Mould Sanders do their work all right—I hear no complaint.

Wishing you success that you merit,

Very truly yours,

J. P. NORTON,
York Corner, Maine.

THOS. GOSS,
President.

A. A. HUBBARD,
Sec'y and Treas.

CITY BRICK COMPANY,

Office, 125 West Second Street.

Telephone Main 788.

LOS ANGELES, CAL., December 20th, 1897.

Messrs. C. & A. POTTS & Co., Indianapolis:

GENTS—It is a pleasure for us to give testimony as to the good qualities of your Iron Horizontal Stock Brick Machine, which we have had in use for the past two seasons.

It gives us entire satisfaction. We have not paid out one dollar for repairs, and the quality of bricks turned out can not be excelled. Our output is 36,500 bricks per day of eight hours.

We will add to this, that, should we need another machine, our first choice would be an ALL IRON POTTS HORIZONTAL.

Yours truly,

CITY BRICK CO.

A. A. Hubbard, Sec'y.

“In every action reflect upon the end; and in your undertaking it, consider why you do it.”—Jeremy Taylor.

And from every State in the Union we have any number of just such letters as the above.



Hundreds of them are in use and every one giving entire satisfaction. We manufacture everything needed on the Brickyard. Now is the time to purchase your supplies for the coming season.

Brick Machines, Disintegrators, Mould Sanders, Granulators, Elevators, Cars, Winding Drums, Moulds, Trucks, Barrows and all Brickyard supplies.

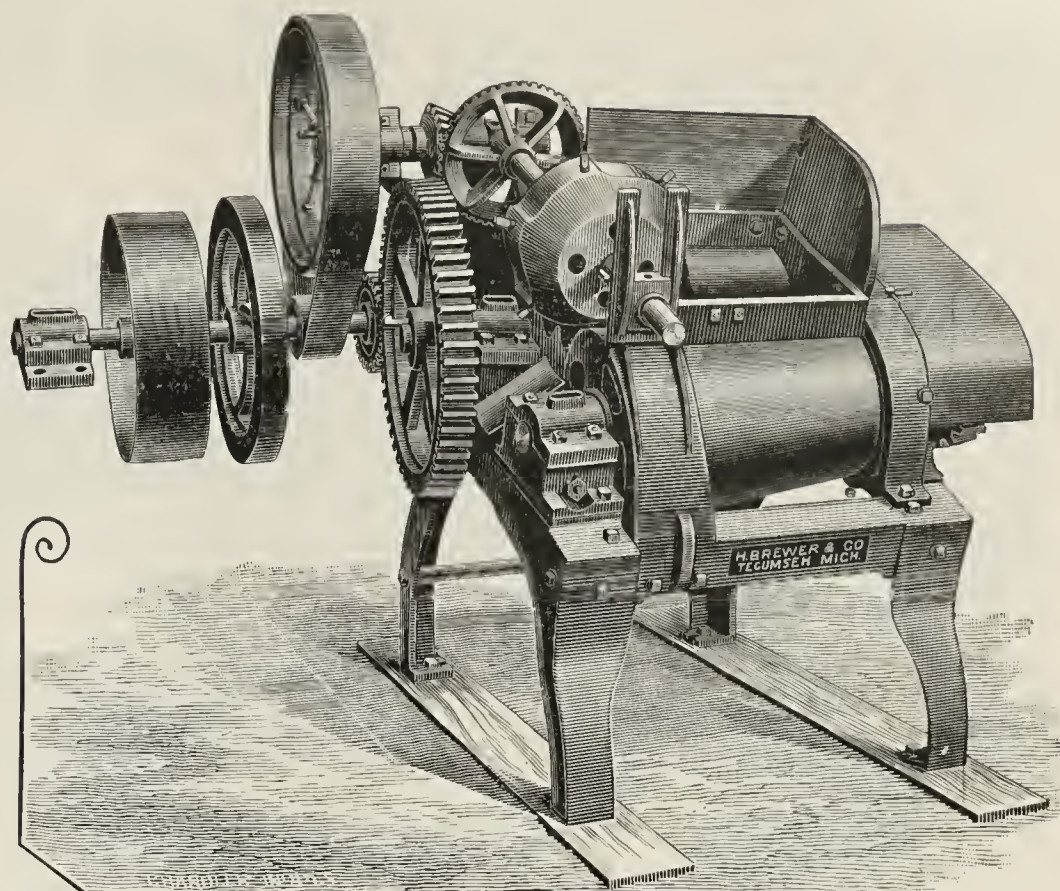
Our prices are low and terms liberal.

C. & A. POTTS & CO.,

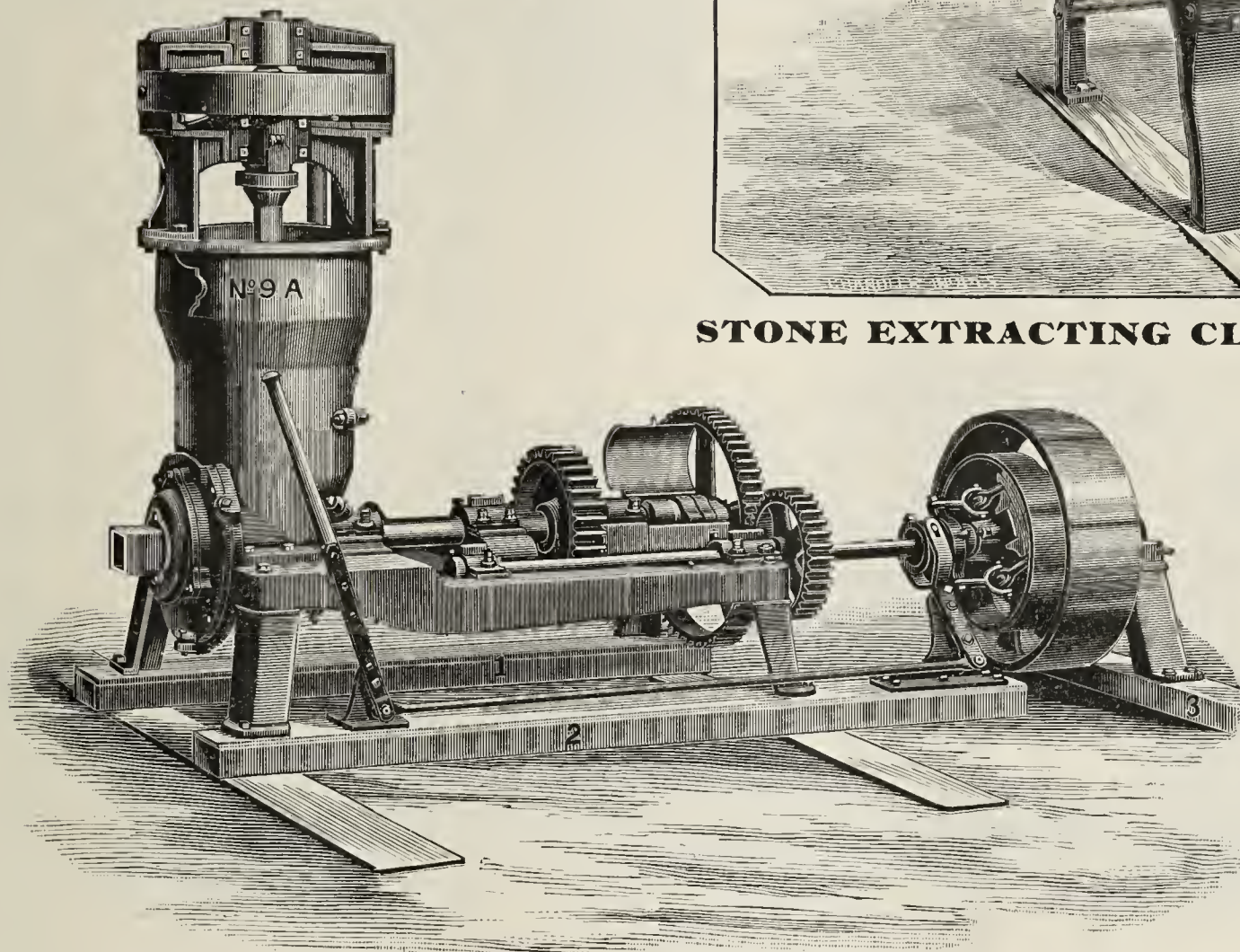
816-828 West Washington St.,

INDIANAPOLIS, IND.

Clay Working Machinery



STONE EXTRACTING CLAY CRUSHER.



No. 9 "A" BRICK MACHINE.

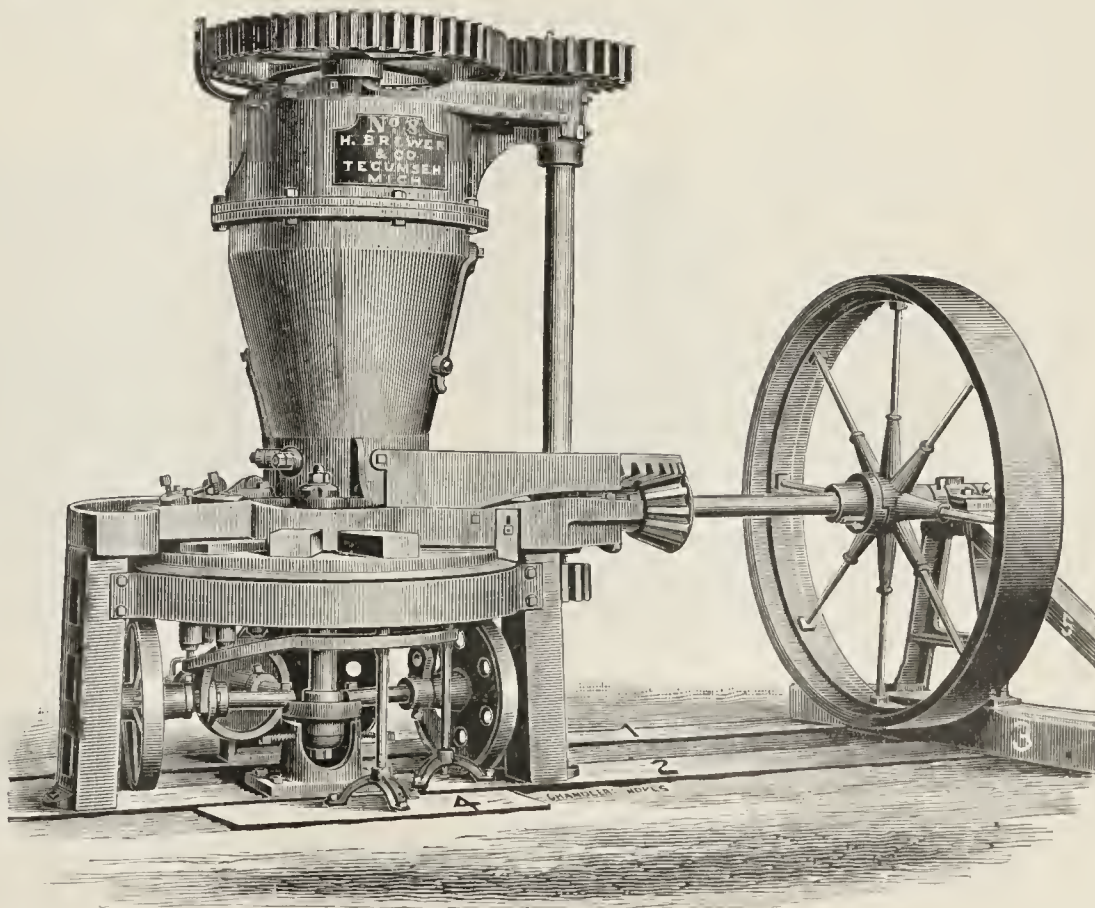
Complete
Brick
and
Tile
Outfits
a Specialty.



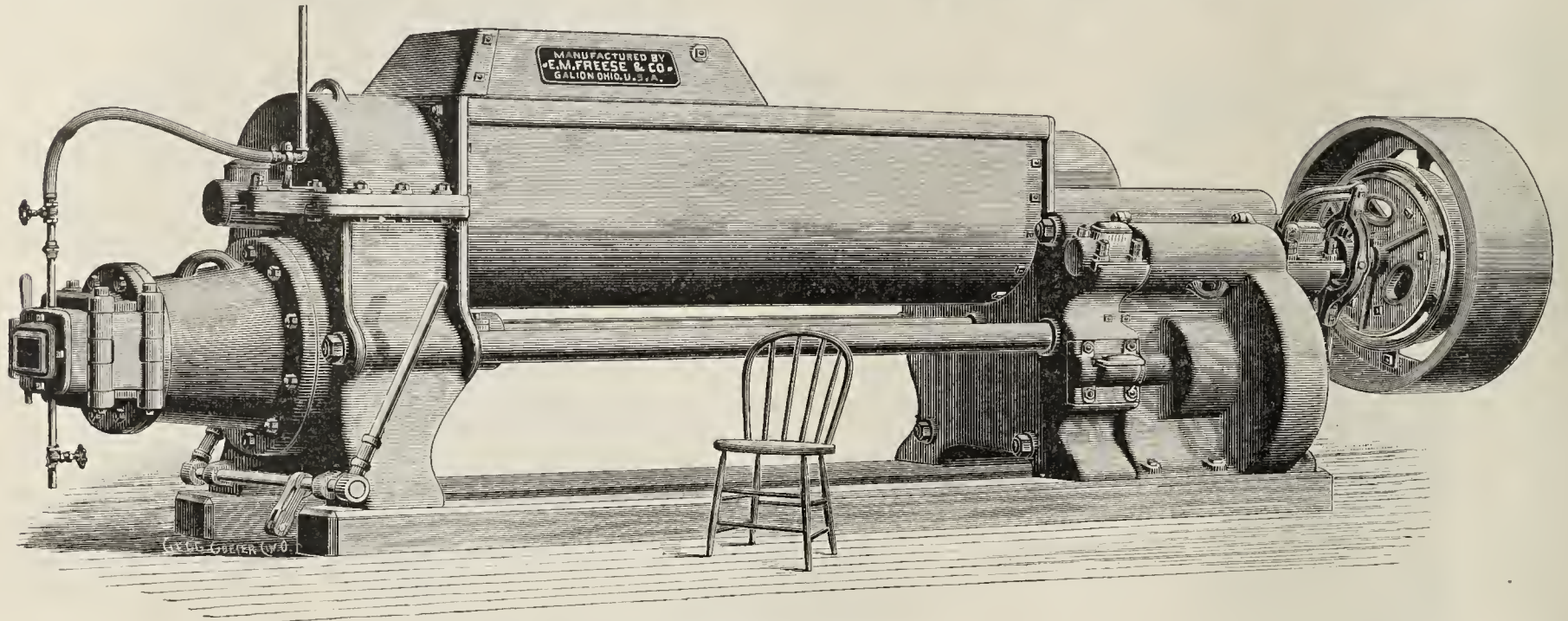
Manufactured by

H. Brewer & Co.,

**TECUMSEH,
. . . . MICH.**

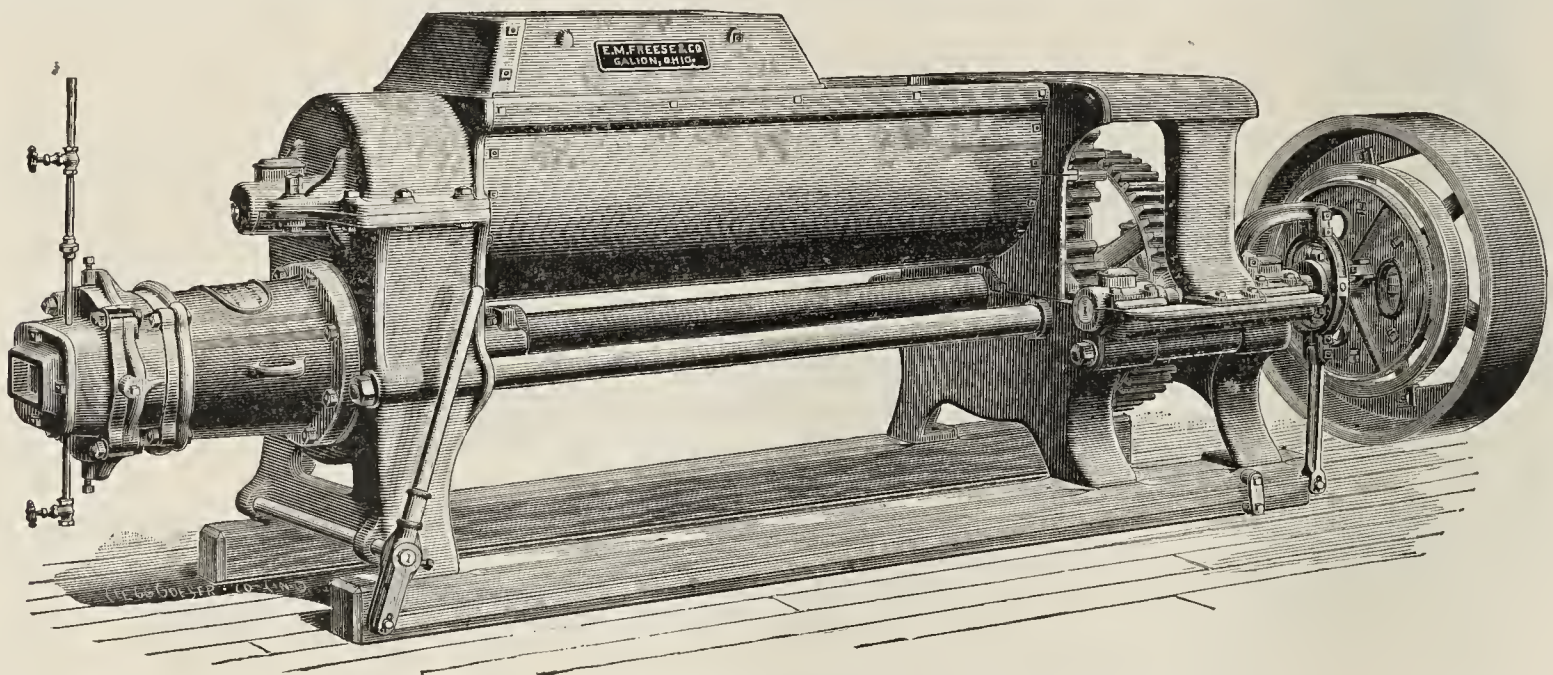


The Original Union Brick Machines



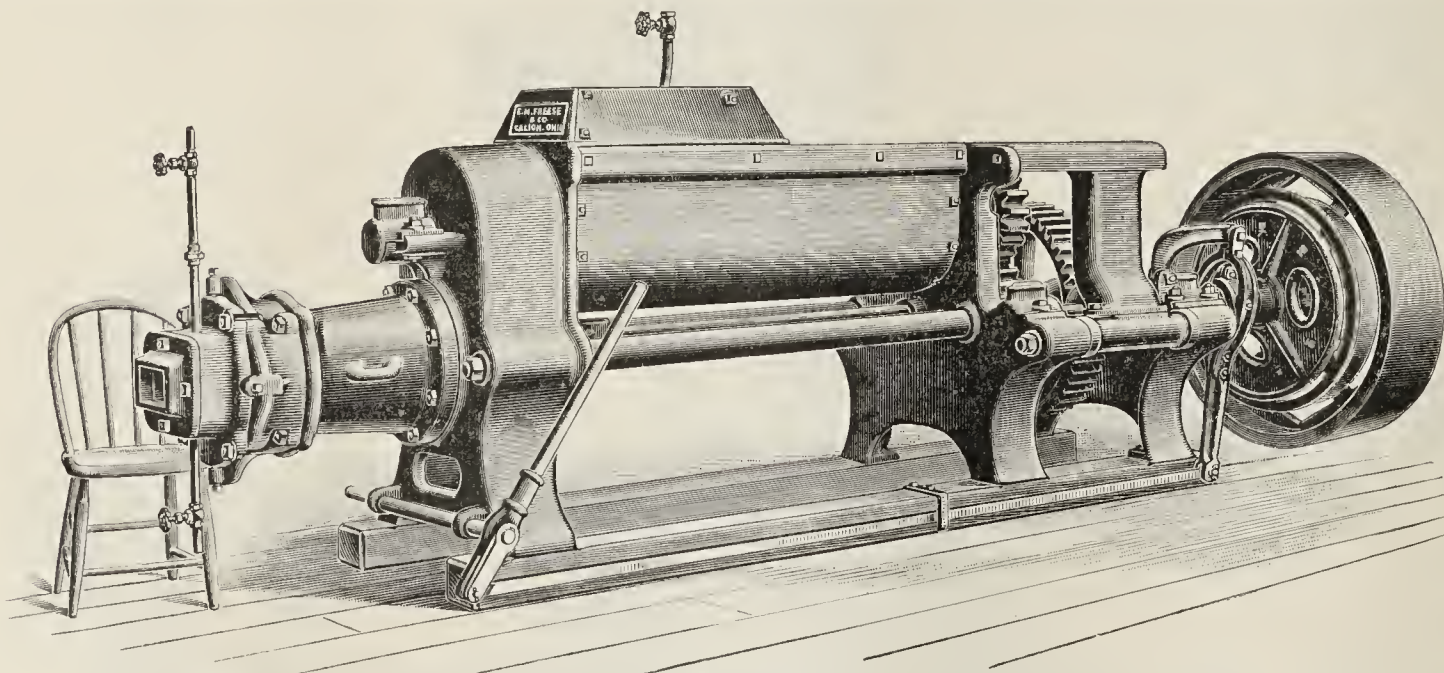
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

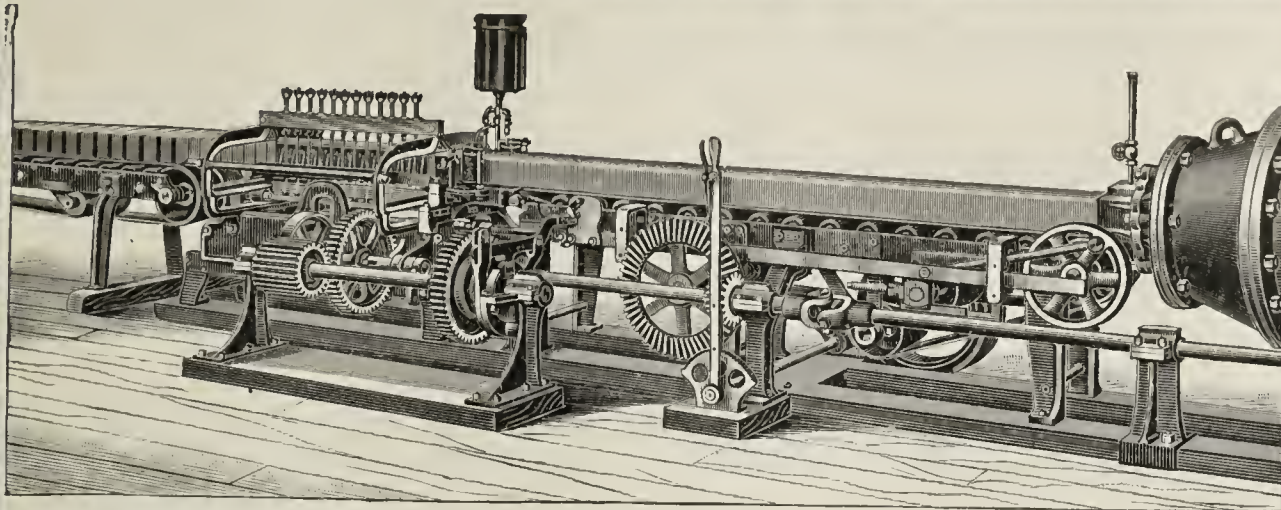
E. M. FREESE & CO., Galion, Ohio.

These Machines are
NOT an experiment.

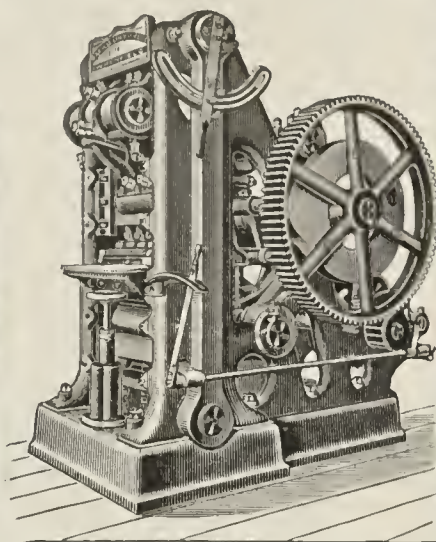
They are used in fif-
teen States.

They are a SUCCESS
Investigate them.

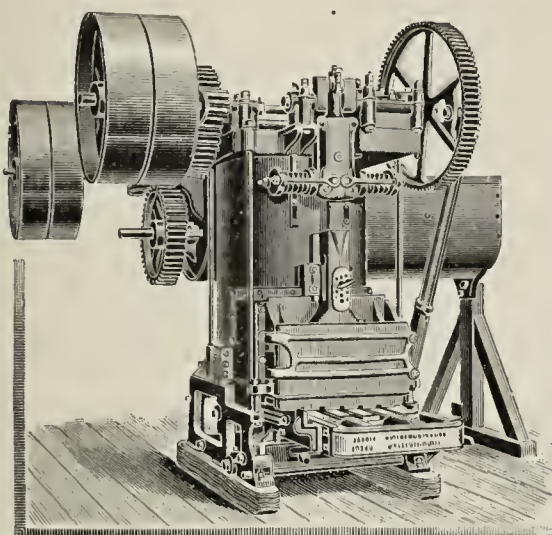
No separate Pug Mill
required.



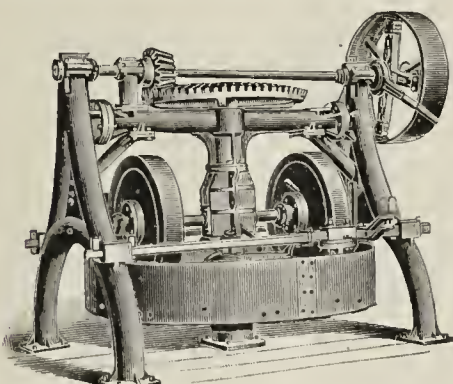
Automatic and Hand Power Brick Cutters.



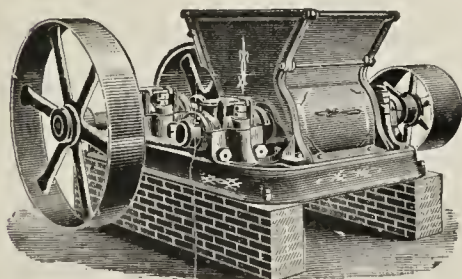
Dry Press Brick Machines.



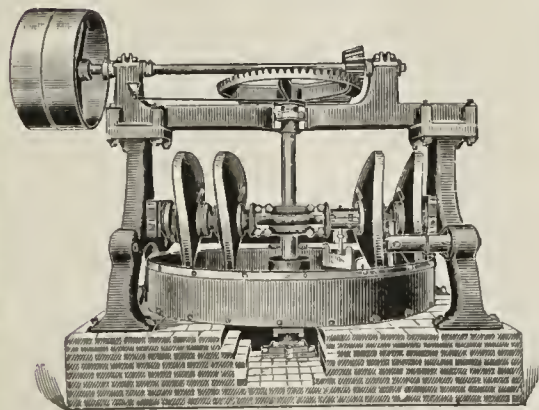
Sand Mold Brick Machines.



Dry and Wet Pans.



Disintegrators.



Special Clay Grinding Mills.

The Winning Line.

In machinery, as in everything else, the best is most economical in the long run. There is but one "Best" and our constant effort and aim has been to win for our line this desired title.

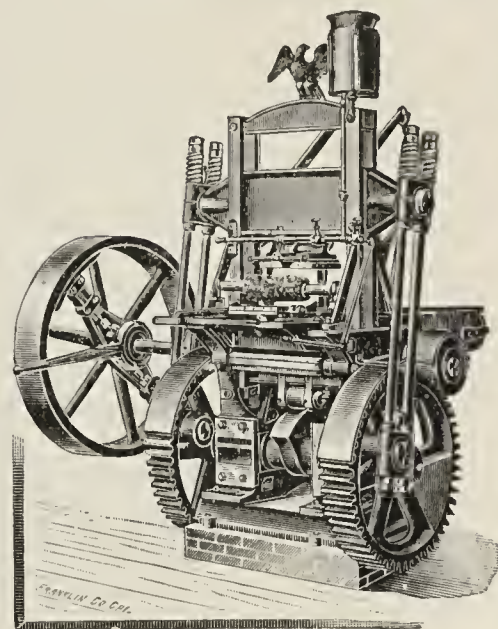
Those who are using our machinery affirm that our efforts have not been in vain. All that experience and genius can devise, are embodied in every machine in our line. This coupled with honest construction under the eye of skilled experts, make a combination which insures your being pleased and not disappointed. Our machinery can be depended upon in any emergency.

You are in business for the money there is in it; with our line of Brick and Tile Machinery, we can help you attain your object. You are progressive and will want to improve. Write us to-day, we can assist you at very moderate cost. If you have not yet seen our new and complete catalogue, send for it at once. It is yours for the asking.

The American Clay-Working Machinery Co.,

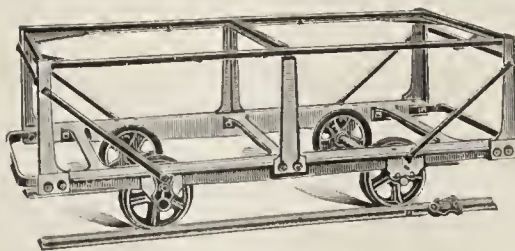
Bucyrus, Ohio.

Long Distance Phone No. 90.

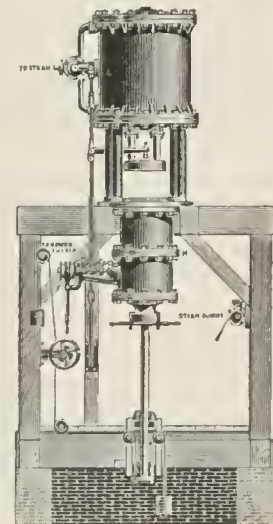


Brick Represses.

For 1898.



No. 2 Dry Car.



Sewer Pipe Presses.

Third Season....

**44,900 Brick every Day for Six Months.
Expense for Repairs and Lost Time \$15.**

NEW HAVEN, CONN., Dec. 1, 1897.

THE EASTERN MACHINERY CO.,

Gentlemen—We have finished our third season with the "New Haven" Machine, and have no reason to change our former good opinion.

We have run this season six full months, and have turned out 44,900 brick every working day the whole season, excepting two days in July, when our racks were full and no brick dry to set.

We think your machine the very best in all essential points of rapid production, quality of brick produced, strength, durability, etc.

It has cost us less than \$15.00 for repairs and lost time for the whole season, and our machine is all ready to start next Spring practically as good as new.

You may refer to us any time.

Respectfully yours,

GEO. W. IVES & SON.

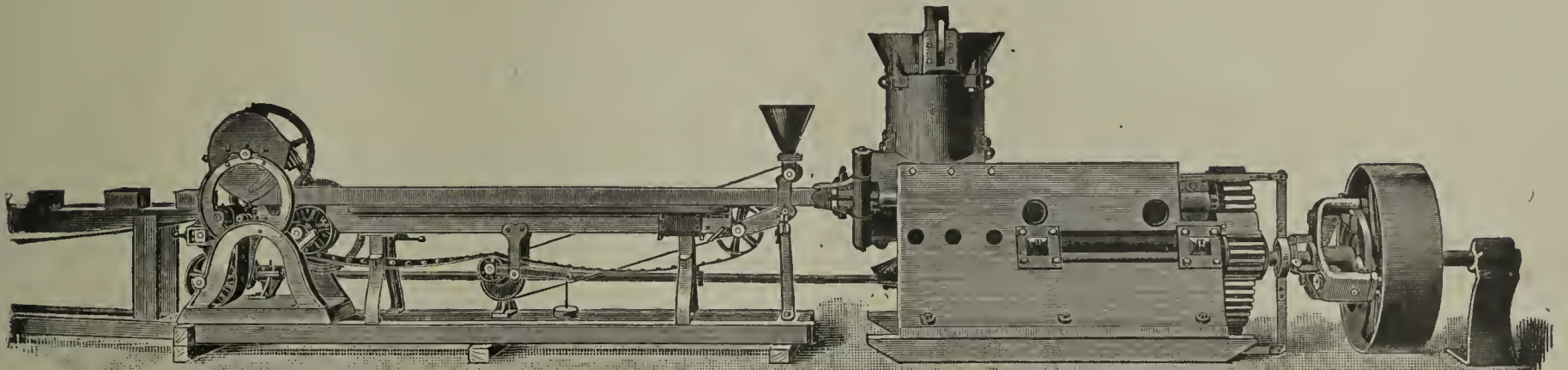
We call that a Good Record.

Write for our "Reports from Reliable People."

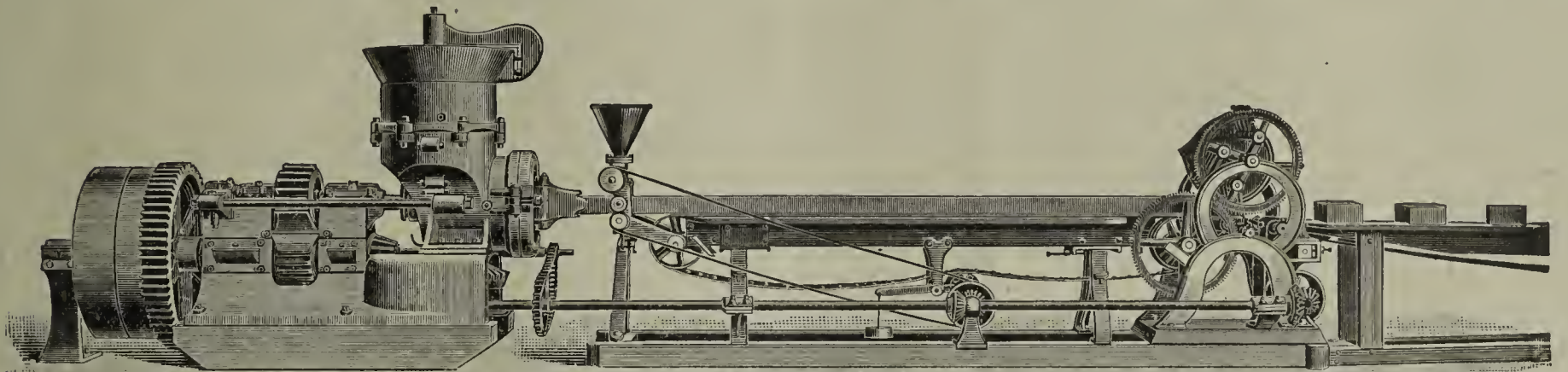
The Eastern Machinery Co.,

NEW HAVEN, CONN.

WONDER MACHINERY.

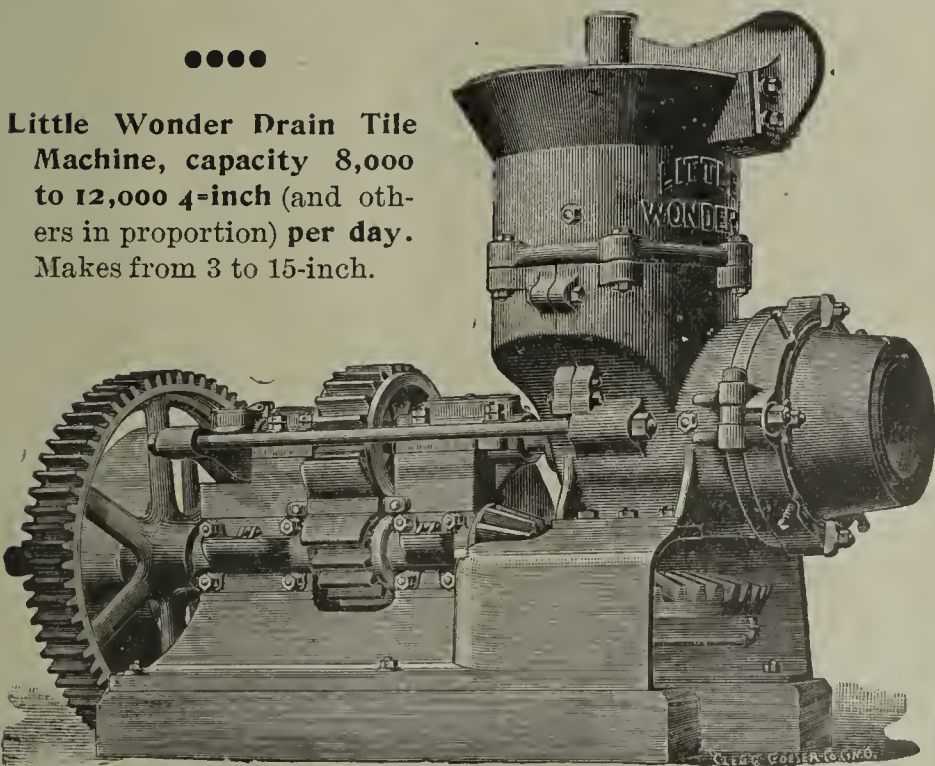


Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

●●●●
 Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



THE WONDER BRICK MACHINES
 have a Great Pugging Capacity, therefore, less lamination in the brick. Guaranteed to run with less power and require less repairs, hence, they are "MONEY SAVERS" and MONEY MAKERS."

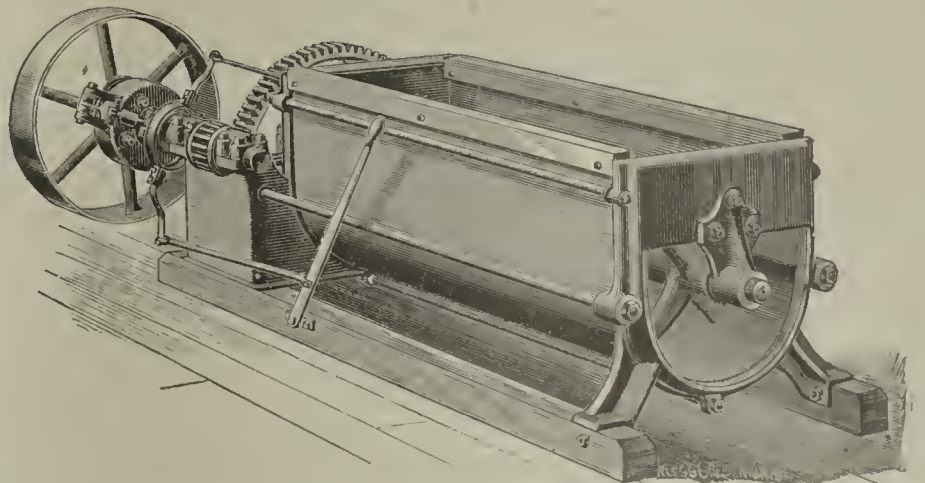
MANUFACTURED BY

The Wallace Mfg. Co.,
 Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

Catalogue Free.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity

Iron Clad Dryer.....IN THE LEAD

All Dry Houses Built in 1898
will be equipped with Important new inventions for reducing cost of drying.

...

**Steam
Heat,
Natural
Draft.**



Guaranteed To dry soft mud, stiff mud, dry pressed brick and tile, free from white-wash, disintegration or other injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,
Harrison 296.

CHICAGO, ILL.

YOU WANT A DRYER THAT WILL DRY YOUR BRICK
WITHOUT CHECKING OR CRACKING

The "ABC" Progressive Brick Dryer

~~~~~DOES IT EVERY TIME.

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RICHARD C. REMMEY & SON, Philadelphia, Pa., write:

"Replying to your favor of the 4th inst. will say that we are doing very satisfactory work with the Dryer purchased from you. We are handling in the Dryer special solid fire clay shapes as large as 36x36x12 inches, and although the material is of a refractory nature, we are drying the blocks without checking, in fine shape. To do such work it requires careful manipulation of the Dryer, but as it is capable of such accurate regulation we have no trouble in controlling the temperature, circulation and humidity just as we want it, and we believe we are doing work with our dryer which is not being accomplished with any other. It is needless to add that we are pleased in every way with it.

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Send  
for  
Catalogue.

## AMERICAN BLOWER CO.,

DETROIT, MICH.





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX, No. 2.

INDIANAPOLIS, IND., FEBRUARY, 1898.

\$2.00 a Year in Advance.

THE C. P. MERWIN BRICK CO.

BERLIN, CONN., November 19, 1897.

CHAMBERS BROS. Co.,  
Philadelphia, Pa.

*Gentlemen:*—Answering inquiry as to machinery furnished us last Spring would say, the outfit of Disintegrator, Pug Mill and Intermediate Brick Machine has made us very satisfactory brick.

Yours truly,  
C. P. MERWIN BRICK CO.,  
Elliott S. Morse, Man.

IT HAS PAID these  
firms to use . . . .

**The  
Chambers  
Machinery.**

THE PALMER BRICK CO.

ATLANTA, GA., Nov. 13, 1897.

CHAMBERS BROS. Co., Philadelphia, Pa.

*Gentlemen:*—Replying to your valued favor of the 2nd inst we are pleased to say we have had your machinery in constant use about six years and would not be without it for double the amount of its cost.

We used other machinery for three or four years before purchasing yours and would not have it again if offered as a present.

Every piece of Machinery we have bought from you has been first-class in every respect.

Yours very truly,  
PALMER BRICK CO.  
W. D. Palmer, Pres.



## AUTOMATIC TEMPERED CLAY BRICK MACHINERY,

MANUFACTURED BY

**Chambers  
Brothers  
Company,  
Philadelphia, Pa.**

—●—  
J. E. EASTES, Agt.,  
Chicago Office,  
171 So. Canal St.

THE MILL HALL BRICK WORKS.

LOCK HAVEN, PA., Nov., 5, 1897.

MESSRS. CHAMBERS BROS. Co.,  
Philadelphia, Pa.

*Gentlemen:*—The Side Cut Brick Machine that you sold us last Spring is giving entire satisfaction, both as to quality and quantity of brick we are making on it.

We are now making first-class brick out of clay that the machine yours replaced would not work.

Wishing you success, we are,  
Very truly yours,  
THE MILL HALL BRICK WORKS,  
Geo. O. Salmon, Supt.

THE JACKSONVILLE BRICK CO.

JACKSONVILLE, FLA., Nov. 5, 1897.

CHAMBERS BROS. Co., Philadelphia, Pa.

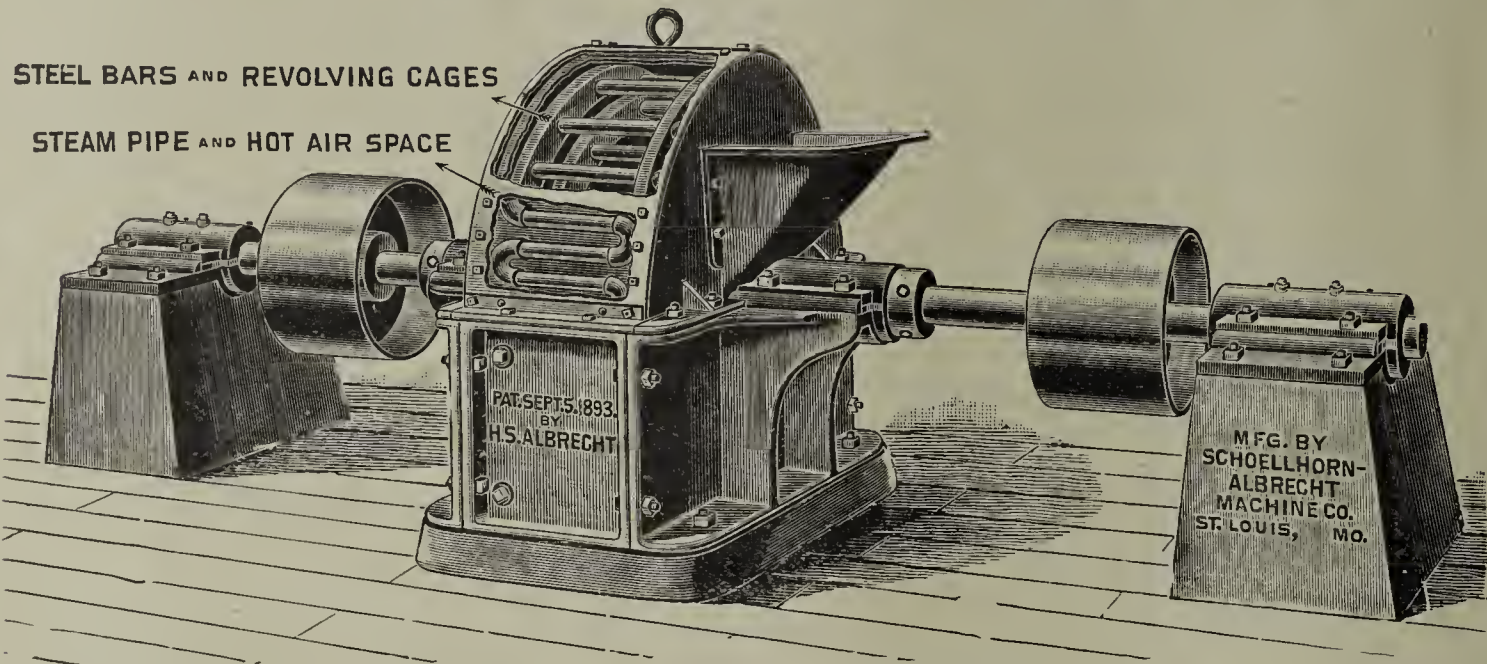
*Gentlemen:*—We are pleased to state that we are using your No. C-CD machine in our plant, and it is giving us perfect satisfaction; we make 40,000 brick per day with ease. The repairs during the three years have been very small in comparison with those required by other machines with which we have had experience.

Taking everything into consideration, we think the "Chambers" a success.

Very truly yours,  
THE JACKSONVILLE BRICK CO.,  
By W. Moore Angas.



# Patent Disintegrator.....



FOR PUL-  
VERIZING  
COMMON  
CLAY,  
FIRE CLAY,  
SLATE,  
PAINT,  
BONES,  
FLINT AND  
ORE OF  
EVERY DE-  
SCRIPTION.

THE SIZES AND PRICES OF DISINTEGRA-  
TORS ARE AS FOLLOWS:

|                   |   |   |      |       |
|-------------------|---|---|------|-------|
| 12-inch diameter, | - | - | each | \$200 |
| 13 "              | " | " | "    | 300   |
| 24 "              | " | " | "    | 400   |
| 30 "              | " | " | "    | 500   |
| 36 "              | " | " | "    | 650   |
| 40 "              | " | " | "    | 800   |
| 48 "              | " | " | "    | 1,000 |
| 60 "              | " | " | "    | 1,600 |

— WRITE FOR DISCOUNTS.

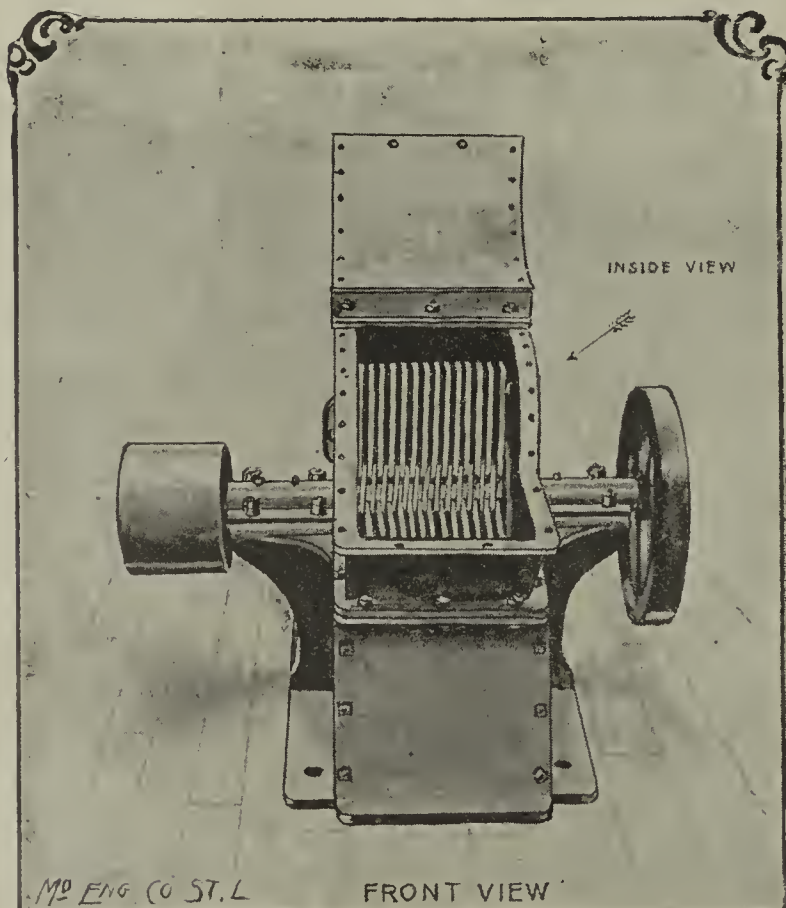
PARTIES DESIRING TO PURCHASE THESE MACHINES will please state for what purpose mill is desired, and same will be built according to the work required of it, as different materials require different construction of the steel bars on the inside.

We have a number of these Disintegrators in use on different materials, and all are giving entire satisfaction.

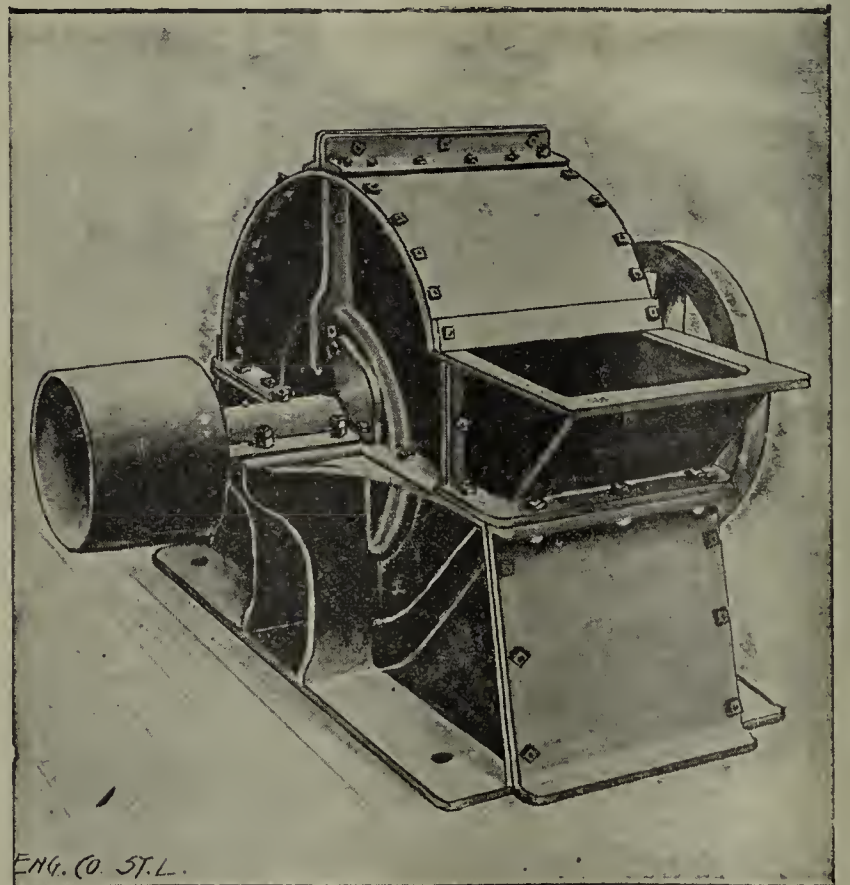
**Schoellhorn-Albrecht Machine Co.,**

609 and 610 North Levee and  
616 and 618 North Commercial St., ST. LOUIS, MO.

## NEW IMPROVED .....PATENT BREAKER AND PULVERIZER.



EXCEL IN CAPACITY AND DURABILITY.



THE SIZES AND PRICES OF DISINTE-  
GRATORS ARE AS FOLLOWS:

|                        |   |   |    |       |
|------------------------|---|---|----|-------|
| 24-inch diameter, each | - | - | \$ | 500   |
| 30 "                   | " | " | "  | 650   |
| 36 "                   | " | " | "  | 850   |
| 40 "                   | " | " | "  | 1,000 |

Write for Discounts.

THESE MACHINES break and pulverize clays and materials of all kinds to an absolutely fine powder. They are far superior to anything of the kind in the market, being provided with our patent self-oiling dust-proof boxes, they can be run at a much higher speed than any others. For full particulars, testimonials, etc., write the

**ST. LOUIS PULVERIZER CO.,** Patentees and  
Manufacturers

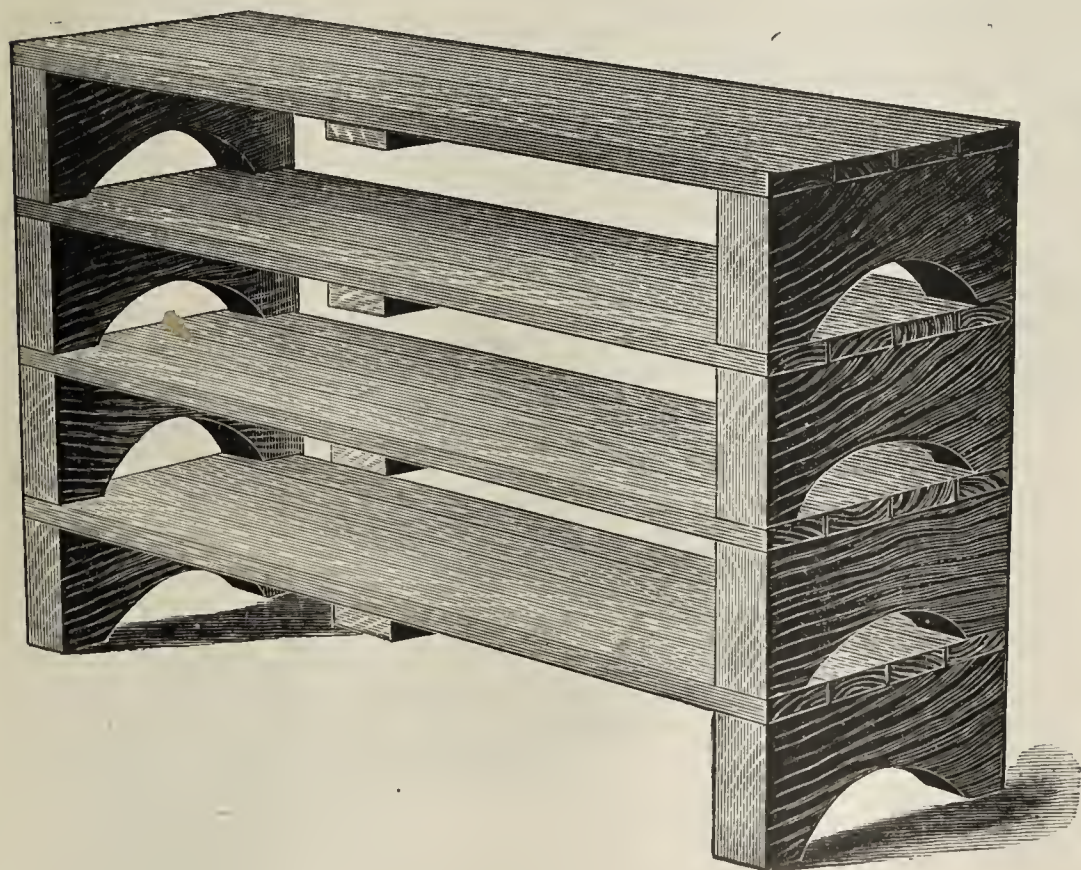
616 N. Commercial St., ST. LOUIS, MO.





Eastern Office: No. 284 Pearl Street,  
NEW YORK.

General Office and Works: No. 231 North Union St.  
CHICAGO, ILL., U. S. A.



IF YOU NEED..

## Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.

Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

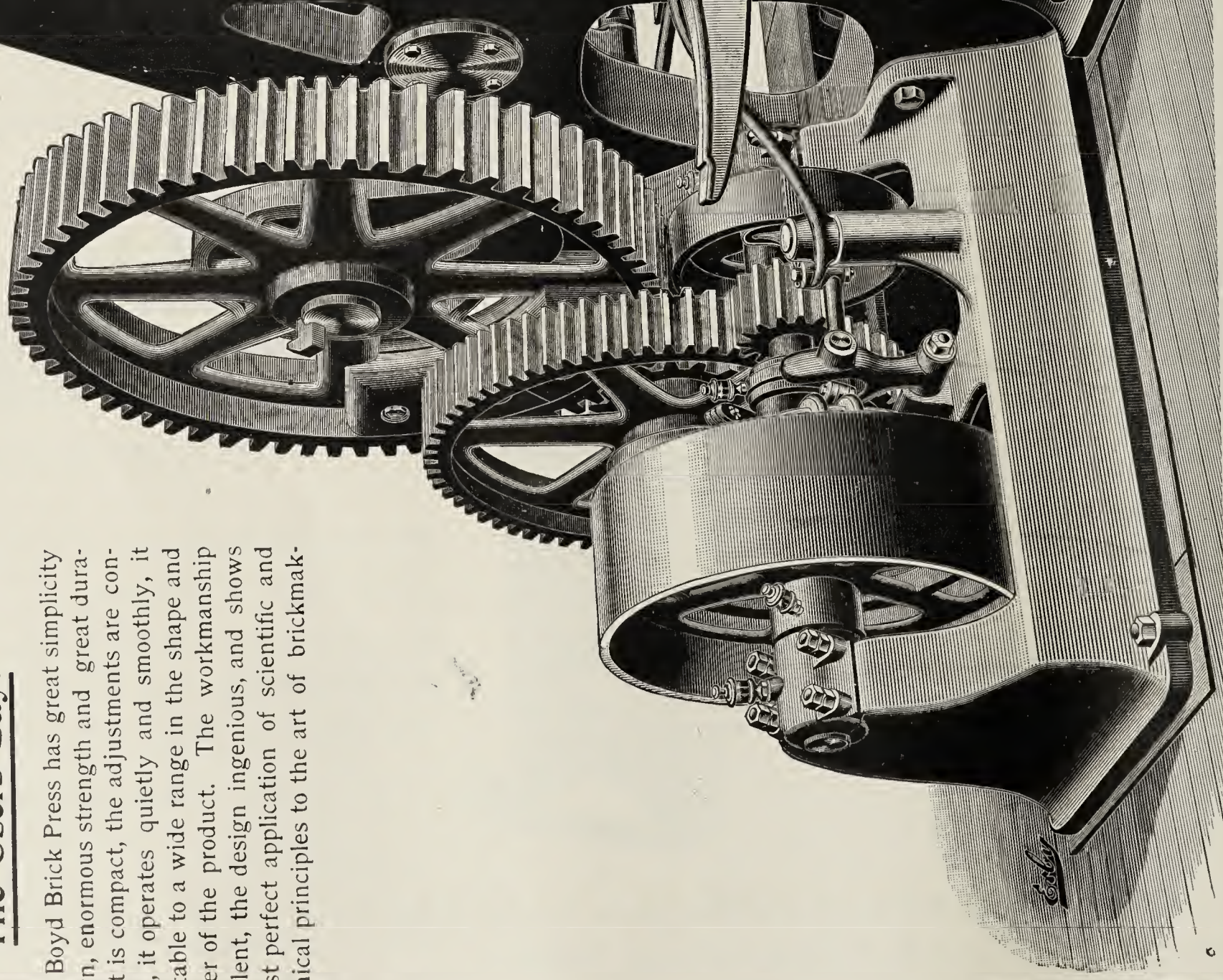
W. B. MERSHON & CO., = Saginaw, East Side, Mich.



# America's Greatest Brick Machine

## The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



BOYD BRICK PRESS  
PATENTED  
CHISHOLM, BOYD & WHITE  
CHICAGO.

THE CLAY-WORKER

OFFICE AND WORKS,  
57th and Wallace Streets,

CABLE ADDRESS:  
"CHISHOLM, CHICAGO"  
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.



# Success for the Brickmaker.

## A BRICK PLANT

Equipped with our machines and system is universal in its work, and will produce at lowest cost per thousand, common building brick and fire brick, as well as high-grade front or face brick.

## NOT THEORISTS.

We are not theorists. We are practical business men—engineers in our profession. We have made a success of our business by making success for our customers. The Brick Plants designed, equipped and started by us are living monuments of our success. The Boyd Presses sent on trial have always enhanced our good name and remained to charm our customer.

## WHERE ARE YOU?

If the Brick Machine Maker won't guarantee you satisfactory burned brick from your material, don't you think you better find some other machine man who will do so, or else abandon the enterprise? Surely there's danger some where, and the machine man knows it. If he gets cash or notes for his machine he's safe, but where are you?

## A STRAIGHT OFFER.

The Boyd Brick Press will be placed upon the yard of any responsible firm on trial, and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the brick shall be satisfactory after being burned.

## Pressed Brick, Fire Brick, Paving Brick, Common Brick.

A....  
SURE  
THING

FOR  
BRICKMAKERS.



We will construct and equip a Brick Plant of any capacity desired, for any responsible party, furnishing Brick Machines, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of Brick, and turn the Plant over to him in proper working order, under guarantee of satisfactory results as to quality of product and cost per thousand; the loss to be ours in case of failure.

## CHISHOLM, BOYD & WHITE CO.,

OFFICE AND WORKS:  
57th and Wallace Streets.

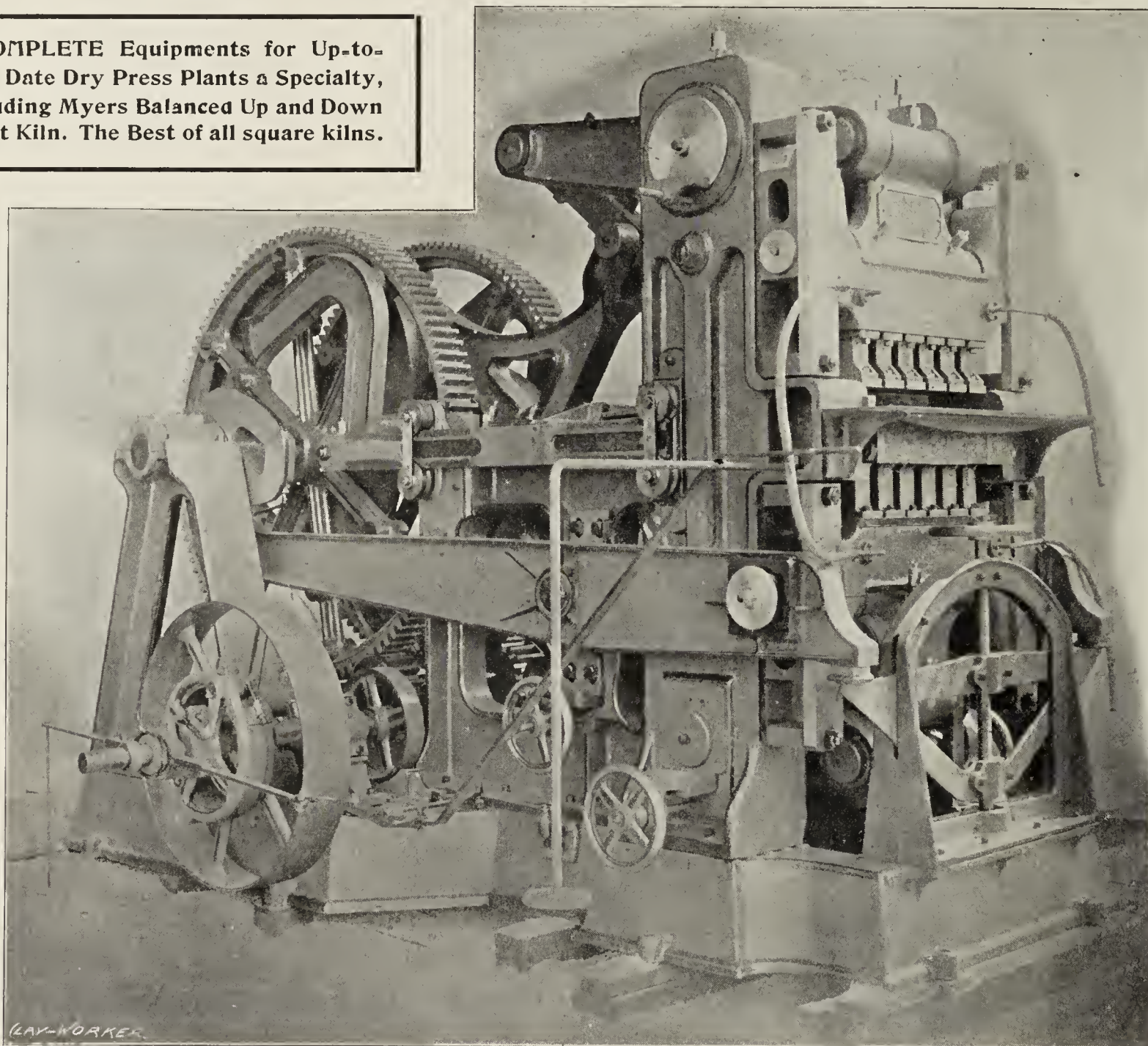
CHICAGO.



# The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

**C**OMplete Equipments for Up-to-  
Date Dry Press Plants a Specialty,  
including Myers Balanced Up and Down  
Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

## The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

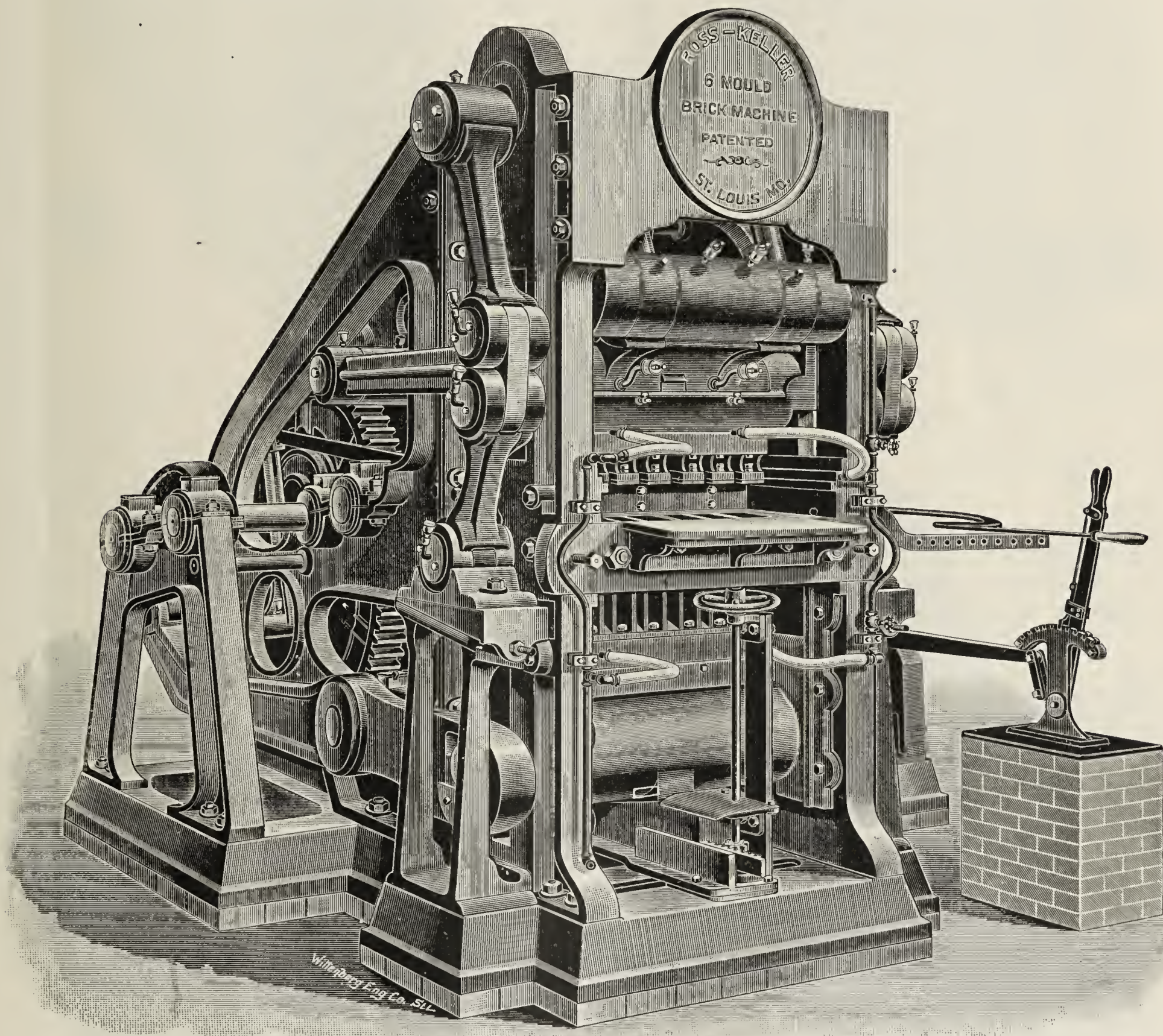
ST. LOUIS, MO.



# The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—————BRICK SET IN KILN DIRECT FROM MACHINE.—————



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

**Ross-Keller Brick Machine Company,**

**820 Commercial Building,**

—————**ST. LOUIS, MO., U. S. A.**



CLAY WORKING MACHINERY

# The Simpson Brick Press, The World's Standard.

Used by the most successful brickyards throughout the United States and Canada.

We manufacture a complete line of Clay-working machinery.

Do not experiment. Invest your money in a **SURE THING**.

Complete plants constructed and guaranteed. Write for catalogue.

## The Simpson Brick Press Co.,

Manufacturers and  
Contracting Engineers,

OFFICE AND WORKS:

77th and Jackson Ave.

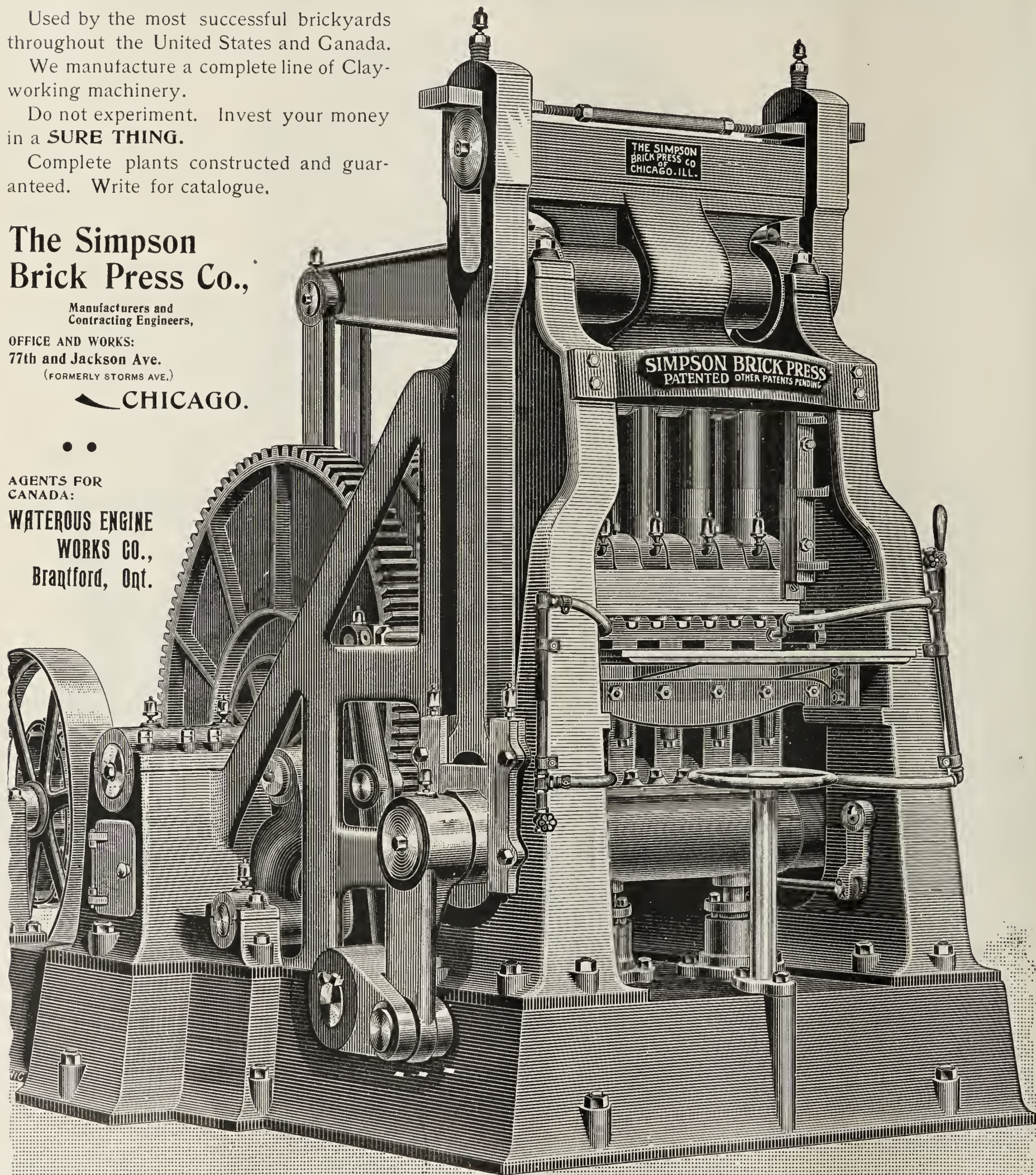
(FORMERLY STORMS AVE.)

CHICAGO.

• •

AGENTS FOR  
CANADA:

**WATEROUS ENGINE  
WORKS CO.,**  
Brantford, Ont.

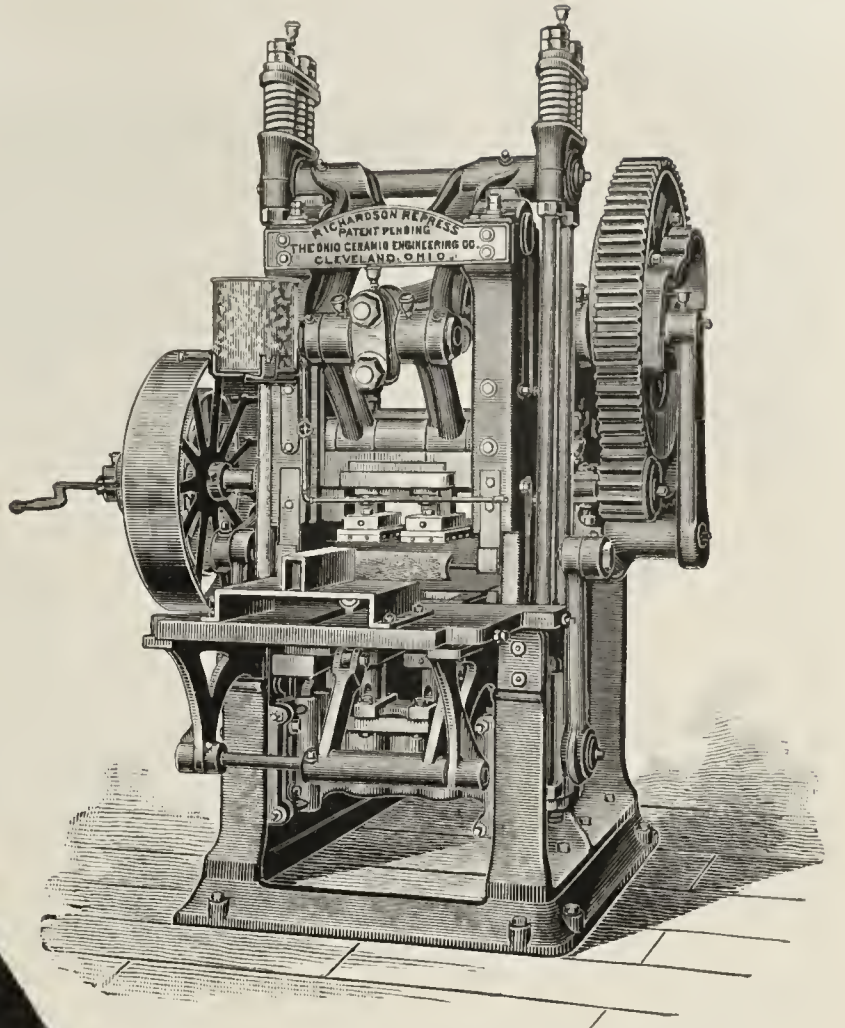




The  
"Richardson"  
Repress  
is not a  
complicated  
machine

The  
Ohio  
Ceramic  
Engineering  
Company.

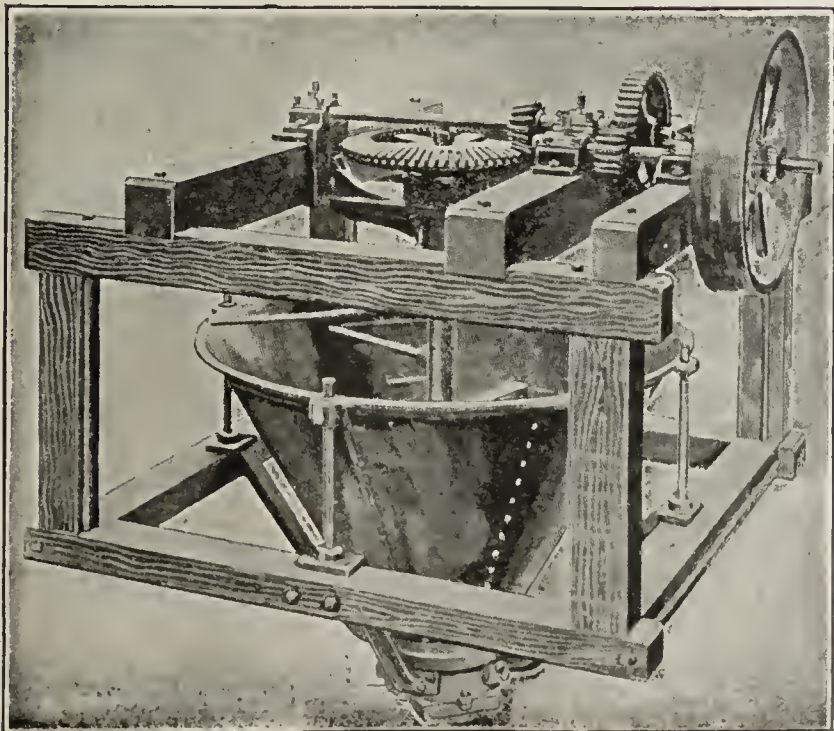
CLEVELAND,  
OHIO



We  
put  
this  
down  
in

Automatic  
Hopper and  
Feeder.

We are the only manufacturers of a successful HOPPER and FEEDER. It thoroughly mixes the clay and stores it, so that a break-down of the Pug Mill will not necessitate stopping the Repress and vice versa. It also TEMPERES THE CLAY automatically—something which has never before been accomplished, and which cannot be done successfully in any other way. Let us tell you about this machine. . . . .



Did You Say

The RICHARDSON REPRESS was complicated? Well, it isn't. The main difference between it and other Represses is that in the RICHARDSON the mechanism is in plain sight, above the molds, while in the others it is hidden beneath the molds, where it catches the clay and grit and wears out quicker as a consequence. Which is best?

black  
and  
white  
Please

remember  
it.

Investigate  
our improved  
Screen.  
It's a  
good one.

Send  
For  
Catalogue.



## BARRELS OF MONEY



**H**UNDREDS OF THOUSANDS of dollars are invested in the brickmaking industry. The Convention of the N. B. M. A. just held at Pittsburg, represented capital from all sections of the Union. Men gathered at the Convention to exchange views, experiences and ideas. Some of them told of successes; others told of failures. It is safe to say that the delegates whose successes were greatest were owners of the best equipment and the best Drier. No matter how experienced or how practical a man may be, he can't meet competition at this end of the century unless he has a first-class plant behind him. We think it within the bounds of reason to say that, of the many thousands invested in the brick industry, no portion of it is so profitably invested as the dollars paid out for

### The STANDARD IMPROVED BRICK AND TILE DRIER.

It stands to-day a model of excellence because of its supreme simplicity and its effectiveness.

It is adapted to the drying of **all varieties** of clay products.

It can be adjusted to suit clays of different nature, much the same as a monkey-wrench can be adjusted to fit nuts of different sizes.

This is because of the absolute control which the operator has over the elements of drying—heat and circulation.

If you didn't get one of our new pamphlets, ("A Drier that Makes Money") at the Convention, drop us a line and we will send you a copy.

If you need drying facilities or Drier equipment of any kind, don't fail to get our prices and terms before concluding a deal.

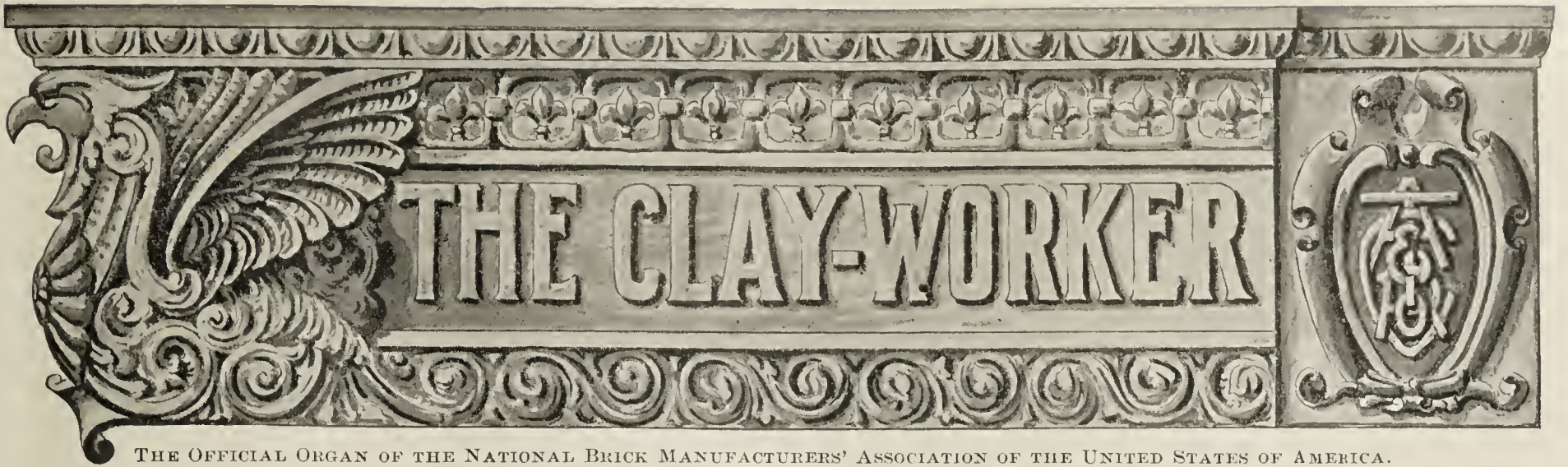
## The Standard Dry Kiln Co.,

PATENTEES and SOLE MANUFACTURERS,

186 South Meridian Street.

INDIANAPOLIS, IND.





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX.

INDIANAPOLIS, IND., FEBRUARY, 1898.

No. 2.



#### OFFICIAL REPORT.

#### Proceedings of the Twelfth Annual Convention of the National Brick Manufacturers' Association of the U. S. of A.

THE TWELFTH ANNUAL CONVENTION of the National Brick Manufacturers' Association met in the banquet hall of the Monongahela House, Pittsburg, Pa., and was called to order by President William H. Brush, Buffalo, N. Y., Tuesday afternoon, February 15, 1898. It was nearly 3 o'clock when President Brush called for order. The hall had a seating capacity of little more than three hundred, and there were but few vacant chairs, which were afterward filled by late comers. The audience, like all N. B. M. A. gatherings, presented a fine appearance, particularly that portion to the left of the speaker, where a group of ladies, the wives and daughters of the members, were seated and gave attentive audience to the proceedings throughout the session.

President Brush: The time has come for us to open this Convention, gentlemen, and we will do it in the regular orthodox way. We have with us the Rev. J. S. Nicholls, of this city, who will open the proceedings with prayer.

—The Opening Prayer.—

Rev. J. S. Nicholls: Almighty God, our Father, we thank Thee that Thou hast put into the hearts of the men who have charge of this Convention the desire to begin its deliberations by acknowledging Thee, Almighty God of all the earth. We desire to rec-

ognize Thee not only as the God of our creed and the God of our churches, but the God who presides over human life and human activity and human business. We beseech Thee to so guide the deliberations of this Convention as that they shall be the means of making more efficient the great branch of the American industry here represented; and may the good which comes from this increased efficiency be felt in all classes of society. Give wisdom and courage of strength of mind and body to these Thy servants as they grapple with the perplexing industrial and social questions connected with their work, and as master and servant meet together, may each serve the other in the spirit of Him who came to reveal the God from on high. Glorify Thyself in our institutions, and in all our works, and embrace us, and make us great and strong as a nation, God-fearing and lasting, for evermore. Amen.

President Brush: Gentlemen, I have the pleasure of announcing that the Mayor of Pittsburg, Hon. H. P. Ford, will now address you.

—Mayor Ford's Welcome.—

Mr. President and Gentlemen of the National Brick Manufacturers' Association:

It gives me great pleasure to welcome to Pittsburg the representatives of what is probably the oldest manufacturing industry on earth, and connected from the earliest times with the convenience and comfort of mankind. In the inspired records of the earth's history your craft is spoken of specifically as early as within the first dozen chapters of Genesis, not as the mere moulding of wet clay into forms and drying it in the sun, but as making bricks and burning them thoroughly—the same art of constructing something which would be of use to man by the use of earth, water and fire which you are following to-day, with nothing added except the machinery which centuries of the ingenuity of man has developed. In its essential ingredients, and

in the general methods of its manufacture, the brick which you are now turning out from your yards to-day



WM. H. BRUSH, President National Brick Manufacturers' Association, Buffalo, N. Y.



does not differ materially from those which were made of the clay still wet from the Deluge, by the immediate offspring and, it requires no great stretch of the imagination to believe, under the direct eye of Noah.

The evidence of brickmaking in ancient times comes down to us from the very oldest ruins which the research of human curiosity has dug up from the buried cities of the past, and the certainty of science on many important subjects depends for confirmation upon the faithful work of those ancient workers in clay, whose habit it was to portray the history of current events upon the brick walls of their temples and palaces.

It is for what you stand for to-day, however, rather than for your honorable past, that we are especially interested in you, and glad to welcome you. You are the national representatives of an industry such as many of our own. You take a raw product of the earth, and transform it by one direct process into a product necessary to man, and among the most important which he has to his use, just as many of our other great Pittsburg industrial concerns take the coal, and the iron ore, and the limestone, the sand and the oil and the natural gas



WM. FLINN, President, Pittsburg, Pa.

which our neighboring hills and valleys supply, and convert them to human advantage.

We are glad to see you especially, therefore, because you are the kind of people we are ourselves, and if you don't feel yourselves at home among us, or if anybody is so unpatriotic as to interfere with you in making yourselves at home, just report him to the nearest policeman.

I trust you will find many things in our city to interest and entertain you, although it is an unfavorable season of the year for sight-seeing. One thing, at least, I think we can depend on. When you examine our brickmaking establishments, and then turn your eyes and see to what a large extent brick has entered into the building of our finest residences and business houses, you will not see reason to deny that we are loyal in our support of home industries.

I do not know what, if anything, our brickmaking exhibit here may have to teach you in the practical and mechanical features of the craft. In another phase of it, however, we can show you something worth considering, not only as brickmakers, but American citizens. We can show you a man—I have no doubt

you will meet him—our leading brickmaker, the head of a concern making twenty-five million bricks a year, but the head also of so many other gigantic enterprises that probably not one man in ten who knows him knows that he is in the brick business at all—a man who is honored and powerful in every circle of the life of our city as highly as any—yet who began his career here in Pittsburg not so many years ago wheeling clay in a brickyard in his bare feet. I allude to Senator William Flinn. In what other country could such a career be possible to a bare-footed brick-yard boy, and why should not we of Pittsburg be proud that it was wrought out in our city?

Gentlemen, I welcome you here, and trust that your deliberations will be profitable and your social intercourse pleasant.

President Brush: This brings us now to our regular order of business, and I will ask the Secretary to announce it.

The Secretary: The next business is the enrollment of members and roll-call. Though enrollment has pretty well progressed, there are a number whose names are not yet inscribed on the membership list, and they will be given an opportunity to drop their autographs and cash later this afternoon. We trust that no brickmaker from abroad will go away from Pittsburg without enrolling his name on the membership list. If it is the pleasure of the Convention, I will suggest that the roll-call be deferred, as it is incomplete, and that brings us, with your permission, to the address of our worthy President.

#### PRESIDENT BRUSH'S ADDRESS.

Gentlemen of the Convention:

After a busy year of labor and strife in our several localities throughout the country, we again meet and exchange greetings. It is a great pleasure to me, I assure you, gentlemen, to once more look into the faces of so many old friends, and note that time is dealing gently with you. Here and there is a head that I fancy is a little grayer, or a little balder than it was a year ago, but as a whole you seem to have prospered. There are a goodly number of strange faces mixed in with the familiar ones, and I am glad, very glad, to bid the new members a hearty welcome. We need all the new blood we can get. You meet with us, gentlemen, not as strangers, but as brothers of a guild having interests in common, one with another.

As I look into the faces about me I miss a number of the faithful who have been with us in years gone by. Some have been kept at home by business or domestic affairs and will be with us again at subsequent meetings. A few have been summoned by the silent messenger to that land from which no traveler ever returns, and their voices that we have so often listened to with pleasure and profit will be heard no more. Though absent, they will not soon be forgotten. The memory of their virtues will linger with us long after they have turned to clay.

It is proverbial that with the busy man time flies quickly. The work of the past season so occupied our attention that, in spite of the worries and cares that are the lot of all brickmakers, it seems but yesterday that we said "good-bye" at Buffalo. Yet here we are once more in Convention assembled, and in the great city of Pittsburg, the Smoky City, the Iron City, the Natural Gas City, the City of Bridges, the Brick City (you see I read the Clay-Worker). I am glad we can meet in a Brick City. A city built of brick is necessarily a substantial city, a safe city, a healthy, wealthy city. We are glad to be here and break bread with our Pittsburg brethren. Remembering their capacity for work and play, we come expecting much, and know we will not go away disappointed.

We meet here, gentlemen, to again confess our failures, that those who follow after may avoid them, and to recount our success, that we may draw new inspiration and take fresh courage for further effort, mixing with our lessons a large portion of good-fellowship and social pleasure. If these yearly meetings resulted in no other benefits, their helpful influence in this direction alone justifies their continuance. But our records prove that there are other and more tangible benefits, benefits that accrue not only to the individual members of this Association, but to the entire brickmaking fraternity—aye, more, to the general public, as well. For the progress and advancement of an industry that converts Mother Earth into the best, most durable, most economical and most sanitary material for the building of homes, work-shops and store houses, is of vital importance to every citizen.

Brickmaking is not only a most ancient industry, but it is a most honorable one as well. While we are supposedly engaged in it for profit (I very much fear that with many this is merely a supposition), making brick for glory alone is very wearing on the nerves and finances. Hence it is with more than passing pleasure that I note a disposition on the part of many brickmakers, particularly those in the larger cities, to co-operate, with a view of obtaining a reasonable return for the labor and capital invested in the business. This is a



hopeful sign, and I trust it will be encouraged by all, individually and collectively. I do not mean that this Association should undertake to regulate or control prices. I know full well that is not the province of this Association. We as a body have never attempted anything of this kind, and I am quite sure we never will, but I believe we ought to give encouragement to local organization in every way we can.

As I have already remarked, the records of this Association show that we are progressing. The record of our last Convention, and the Report of the Paving Brick Commission embodied in it, is an abiding monument to this Association and the gentlemen who, under Prof. Orton's direction, so faithfully carried out the work assigned them. In this connection, I think a word of commendation is due our allies, the machine men, for the substantial assistance rendered by them. But for their assistance, the Report could not have been published without additional individual subscriptions.

Another important step which is destined to bear good fruit is the establishment of a free scholarship in the School of Ceramics in the Ohio State University. This work will surely commend itself to every thinking, enterprising clayworker in the country who has the welfare of our industry at heart and desires to see it advanced to a leading position among the industrial arts and sciences that it justly deserves. The good work should be continued and maintained effectively. If our present revenue is not sufficient for the purpose, I, for one, am earnestly in favor of increasing our fees to a figure that will be sufficient, and believe the members will without exception concur heartily.

You will see, gentlemen, by looking over the programme, that our faithful and indefatigable Secretary has provided us with a bill of fare that, if we discuss as we should and digest properly, will keep us very busy for the balance of the Convention. So I will not take your time further, except to thank you for the honor you have shown me. When you elected me to preside over your deliberations, a year ago, I accepted with fear and trembling. That I have got along so nicely, and that the business of the Convention has been carried forward so smoothly, is due more to your patience and forbearance than to my ability as a presiding officer. I assure you, gentlemen, that I greatly appreciate your kindness, and only wish I might have served you better. [Loud applause.]

The Secretary: The report of the Treasurer is next on the programme.

Treasurer Sibley presented the following report:

#### TREASURER'S REPORT.

To the Officers and Members of the National Brick Manufacturers' Association:

Gentlemen—I hand you herewith statement of receipts and disbursements account of the Eleventh Annual Convention. I regret to state that in order to show a clear balance sheet on account of same, we have been compelled again to encroach upon our reserve, until it is now below the century mark. This was caused in the main by the donation of scholarship in Ohio State University, authorized by the last Convention. That was a good work well begun, and we cannot afford to retrograde in so laudable an undertaking. But it behooves us to retrench somewhere (though I confess my inability to discover in what particular), or some change must be made in our "tariff for revenue only."

Ever since "the four-year-old" left our ranks there has been an annual deficit, but now that we are in his own domain, I trust he will prove as veritable a "mascot" for us as he was for the West Penn Brick Exchange. May the Twelfth Annual Convention mark the era of largely increased receipts for us, so that we may keep our finances on a safe and sound basis.

In order to maintain my reputation as a surplus-maker, even from deficits, it is some consolation to state we still have on hand in the treasury \$94.88.

Respectfully submitted,  
JOHN W. SIBLEY, Treasurer.

#### RECEIPTS.

|                                                 |                   |
|-------------------------------------------------|-------------------|
| Balance in Treasury Account, 1896.....          | \$198.32          |
| Membership fees—231 at \$2, account 1897.....   | 462.00            |
| Membership fees—60 at \$5, account 1897.....    | 300.00            |
| Advertisements in Convention Report.....        | 180.00            |
| Sales of Report of Paving Brick Commission..... | 110.50            |
| <b>Total .....</b>                              | <b>\$1,250.82</b> |

#### DISBURSEMENTS.

|                                                                                         |          |
|-----------------------------------------------------------------------------------------|----------|
| Scholarship, Ohio State University, per voucher.....                                    | \$250.00 |
| Expenses Paving Brick Commission, per voucher.....                                      | 203.79   |
| Paid for 1,000 programmes, mailing, etc., per voucher....                               | 29.50    |
| Paid Trunk-Line Ass'n attendant, per voucher.....                                       | 17.00    |
| Paid for 1,000 Annual Reports and 500 Paving Brick Commission Reports, per voucher..... | 276.90   |
| Paid Secretary's traveling expenses, per voucher.....                                   | 250.00   |
| Paid Assistant Secretary, per voucher.....                                              | 50.00    |
| Paid stationery, postage, expressage, etc., per voucher..                               | 78.75    |

|                          |            |
|--------------------------|------------|
| Total expenditures ..... | \$1,155.94 |
| Balance in treasury..... | 94.88      |

\$1,250.82

Respectfully submitted,  
JOHN W. SIBLEY, Treasurer.

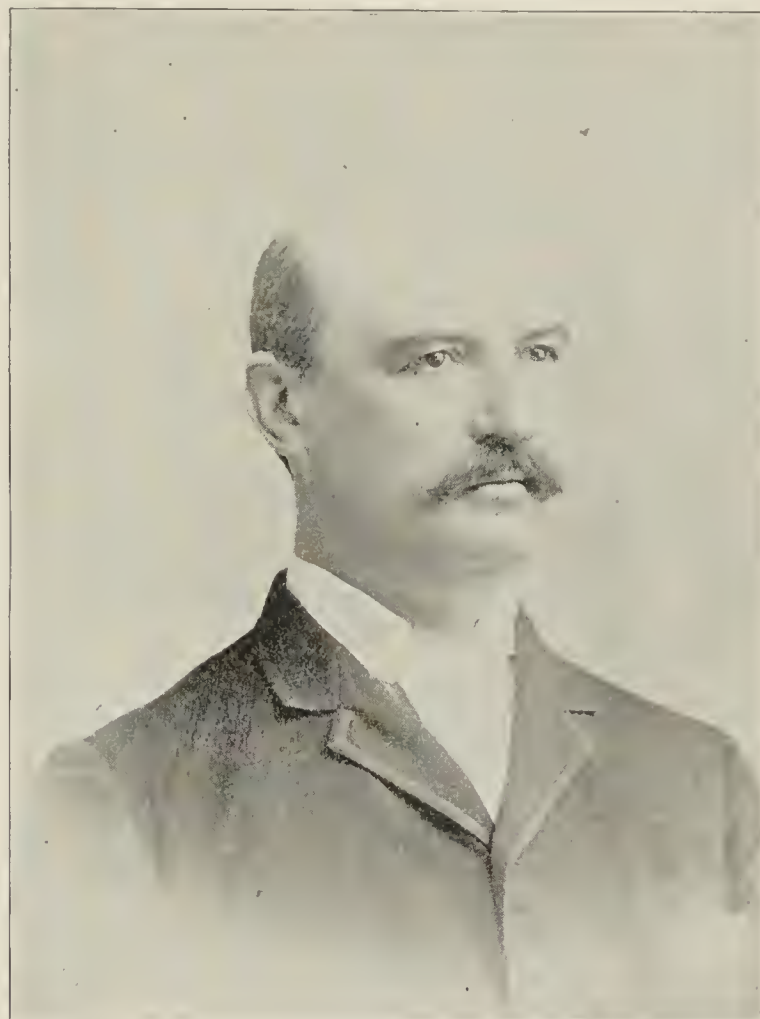
Mr. E. M. Pike: I move that the report of the Treasurer be received and placed on file. (Carried.)

Mr. D. V. Purington: I have a resolution, which is very short, which I desire to read, and if it is seconded I wish to say a few words upon it.

"Resolved, That all resolutions relating to questions of legislation or rules governing the Association, or which involve an expenditure of money, shall be referred to the Executive Committee."

Mr. F. H. Eggers: I second the resolution and move its adoption.

Mr. D. V. Purington: I want to simply and briefly explain why it has seemed necessary to certain members of the Executive Committee that a resolution of this kind should be introduced. Heretofore at all of our annual meetings, whenever a resolution of any kind, no matter to what it referred, was introduced, it was referred to the Committee on Resolutions. This committee is appointed usually as an honorary committee, and in the hurry of the Convention work very little time is given to



L. J. HOWARD, First Vice-President, St. Louis, Mo.

the consideration of these resolutions, and very many matters of interest and of importance are necessarily slighted in their consideration; and for that reason I hope that this resolution will be adopted, so that these vital matters which refer to the interest and welfare of this Association may be considered by the Executive Committee.

The question on the adoption of the resolution was put and carried.

The Secretary: Before taking up the regular programme, inasmuch as Mr. Purington has broken through the line, I beg permission to read now a letter or two from some of the older members detained at home by unforeseen things.

#### LETTERS FROM ABSENT MEMBERS.

Denver, Colo., Feb. 11, 1898.

T. A. Randall, Secretary N. B. M. A.:

Dear Sir and Brother—Inclosed find two dollars for my dues to the N. B. M. A. I regret very much that I am unable to attend, but for three years I have had the doctor every day to dress my face, from that old wound which I received in the army. Tell Brother Blaffer I expect he fired that shot at me, but he didn't know then that I was



a brother brickmaker, or I am sure he would have fired it at some other fellow.

I would have been delighted to have gone, for I have some very close relations in Pittsburg.

Hoping you will have a very enjoyable Convention, as well as a profitable one, and wishing to be remembered to all the members, particularly the young crowd, such as Adams, Ittner, Purington, Eudaly, Blair, Flood and so on, I am very truly yours, with regrets, an absentee,

JOHN McCAIN.

New Orleans, Feb. 10, 1898.

My Dear Mr. Randall—I am just in receipt of your official programme enclosing a ticket, extending the freedom of the city of Pittsburg to all brick manufacturers who may come within its domain during the coming week, and now on the very eve of my departure find myself unexpectedly, and reluctantly indeed, compelled to forego the great pleasure I have anticipated in meeting all my old friends and making the acquaintance of new ones, for

"Blest be the spot where the fruits of toil repair,  
And strangers find a ready chair."

Be this as it may, "What can't be cured must be endured," and must now content myself in awaiting receipt of the official report of the convention, which, judging from its programme, I am sure will be an instructive and entertaining one.

Enclosed \$2.00 for my membership dues, and, wishing you and my



WM. CONWAY, Second Vice-President, Philadelphia, Pa.

friends all the pleasure this meeting must necessarily bring about, I remain,

Yours truly and fraternally,

J. A. BLAFFER.

Chicago, Feb. 14, 1898.

Mr. T. A. Randall, Secretary National Brick Manufacturers' Association, Indianapolis, Ind.:

Dear Sir—I send you by our friend "D. V." \$2.00 to renew my membership in the National Brick Manufacturers' Association for the ensuing year.

I wish you to express my regrets to the members of the Association for my inability to be present with them this year, as the dawn of prosperity makes business so rushing that it is impossible for me to leave the city. I should be very glad to be able to participate in your convention, and all I can say is that I extend to the members of the convention a hearty invitation to call upon me in Chicago whenever they come this way, and also to have them visit our works at Porter, Ind., if they have time. Any of them will be heartily welcome.

Yours very truly,

S. S. KIMBELL,

General Manager Chicago Hydraulic-Press Brick Co.

Augusta, Ga., Feb. 10, 1898.

T. A. Randall, Secretary N. B. M. A., Indianapolis, Ind.:

My Dear Sir—Received official notification this morning. Sorry I cannot be with you, being satisfied the time would be well spent. I inclose herewith two dollars for membership dues. Please acknowledge.

While absent in person, I'll be with you in spirit all of next week, and will look forward with no little impatience for the account of the proceedings when they appear in the Clay-Worker.

With best wishes for yourself and all who may be so fortunate as "to be there," I am,

Yours truly,

W. E. McCOY.

#### ELECTION OF OFFICERS.

The President: This brings us to the election of officers. As you all know, the election, according to the constitution, is by ballot. The first office to be filled is that of President.

Mr. Xavier Wittmer: Mr. President, Ladies and Gentlemen—We of Pittsburg have among us a gentleman suitable for this office—a man of unlimited ability. There is nothing too small for his notice nor too large for his undertaking. His ability rises with the necessities of his surroundings. He is a worker. While comparatively young, he has done more work, public and private, than any five men in this community. The earnestness and courage with which he does his work is inspiring. And he thoroughly enjoys his work. It would do you good to see him rip up an old railroad and build a new one in its place, agreeing to do the work in ninety days, and finishing it in forty-five days. The tools and machinery he gets up to work with are like giants trained for the special purpose, with strength to spare. He is also a brickmaker. One who, when he found brick were needed faster than they were made, got a location right in the heart of the city, where clay was dirt cheap, got machinery larger than any of the rest of us had, run it faster than any of the rest of us run ours, turned out twice as many brick as any of us did, and at once became the leading brickmaker of the two cities, and all the rest of us have been trying to catch up to him ever since. Gentlemen, he is just the kind of a man we want to add to the list of Presidents and leaders of the leading brick manufacturers of the land. I want you to all vote for him and elect him unanimously. Mr. President and gentlemen, I have the honor of nominating for your President for this Association, for the coming year, our friend and townsman, Senator William Flinn. [Applause.]

Mr. D. V. Purington: Mr. President and Gentlemen—I have come to this Convention with the expectation, as I know a majority of the older members of the Association have, of voting for our friend, Mr. Wittmer, who has so eloquently placed Mr. Flinn in nomination for the presidency of this Association. I have never met Mr. Flinn before—at least never but once, and I do not now know whether it was he or his partner; but I am satisfied, from the words of eulogy Mr. Wittmer has pronounced and from what I have heard here to-day, that the people of Pittsburg know Mr. Flinn well, and that they would not propose him for the position of President unless they knew his fitness for the place. It therefore gives me a great deal of pleasure to second the nomination of Mr. Flinn.

Mr. W. A. Eudaly: In making the motion that I am about to make, I want to say that, while I do not know personally very much about Mr. Flinn, we have all heard of him. We do know Mr. Wittmer, and we know him to be a man of few words. I do not believe there is a member of our Association who has ever dared to question one of his utterances. When he makes a statement we all submit, and his recommendation of a man goes a great way. We all believe what he says. And when he says that Mr. Flinn will rip things up generally along the line of this Association, we have great reason to believe it; and when he says that Mr. Flinn does things in forty days that would take other men sixty, I hardly believe he wants us to understand that under Mr. Flinn's leadership we can rush our work so as to adjourn one day earlier than the programme indicates. [Laughter.] I hardly believe he means that. Mr. President, a long speech would be very unbecoming in me, and always is, and I want to move that nominations close, and that



the Secretary be authorized to cast the unanimous vote of this Convention for Mr. Flinn.

Mr. F. H. Eggers seconded the motion, which was put and carried.

President Brush: We will now take up the election of the Vice-Presidents.

Mr. F. H. Eggers seconded the motion, which was put and tion for the First Vice-President Mr. Laclède J. Howard, of St. Louis, Mo.

Mr. D. V. Purington, Chicago: I desire to place in nomination for Second Vice-President Mr. William Conway, of Philadelphia, Pa.

Mr. Frank L. Stiles, New Haven: I rise to nominate for Third Vice-President Mr. E. S. Morse, of New Britain, Conn., representing one of the largest yards in our section, a man who will do honor to your craft if you see fit to elect him.

Mr. D. V. Purington: There having been three nominations, I move that the nominations be closed and the Secretary be instructed to cast the unanimous ballot of the Association for the three men named for the respective offices.

Motion carried.

The Secretary duly cast the ballot.

President Brush declared the gentlemen elected.

The President: The next in order is the election of a Secretary.

Mr. F. H. Eggers: I think we are all prepared to vote for one man for that office, and I am not going to make a speech. I do not think it is necessary. I desire to place in nomination Mr. Theodore A. Randall, our present Secretary.

Mr. W. A. Eudaly: I move that the nominations close and the President be authorized to cast the ballot of the Association for the gentleman named.

Motion carried.

The President duly cast the ballot and declared Mr. Randall elected.

The President: We will now vote for a Treasurer.

Mr. A. Ittner, of St. Louis: I always favor the policy of keeping a person in harness if they do their work well, and as our present Treasurer has performed his duties so efficiently, and as he always manages to get a little fun in his report, I move, if necessary, that the rules be suspended and that Mr. John W. Sibley, of Birmingham, Ala., be elected Treasurer by acclamation—that is, with the understanding that he keeps up his little witticisms and fun and the balance on the right side.

The motion was put and carried and Mr. Sibley was duly elected.

The President: Our next order of business is the installation of officers. I will appoint Brothers Wittmer and D. V. Purington to escort our newly-elected President to the chair. [Great applause.]

President Brush: Gentlemen, I have the pleasure of introducing to you our new President, Honorable William Flinn. It is with quite a feeling of relief that I am brought to this point of the proceedings. You will find many people elected to offices which have profit and honor in them who do not like to give up the gavel. I assure you I am not built that way, and I most graciously give it up. I have been a brickmaker all my life—my father was a brickmaker before me—and I always expect to be a brickmaker, and always expect and hope to attend your meetings regularly. I shall, of course, be on your Executive Committee, and I am going to do my duty. [Applause.]

President Flinn: Ladies and Gentlemen of the Twelfth Annual Convention of the National Association of Brick Manufacturers—I notice the ladies are in attendance as well as the gentlemen. I return to you my sincere thanks for the great compliment you have paid me in selecting me as your presiding officer. You come here from all parts of this great country of ours for the purpose of bettering your condition in various ways, by the comparison of ideas, the getting shoulder to shoulder, the getting better acquainted; you are simply pursuing the theories and practices that the great nations of the earth pursue and the great industries of the world pursue. I have had

some little experience in life. I really never saw the ideas that emanated from a single brain amount to much until they were rounded up and fashioned and put in shape by comparison of ideas with other people. So it is with you, gentlemen, when you come to these Conventions—it must necessarily better your condition, both in purse and mind, by a comparison of ideas, one with the other.

As has been said by our worthy Mayor, you are pursuing a vocation in life which is one of the oldest and most ancient known to history—a creditable vocation, and one which I think is just in its infancy. When I give what little thought and time I am able to give to the brickmaking branch of our business, I am surprised to discover how little I know. I have never attended any of your meetings, but when my friends very kindly and generously insisted that they desired my election as President of your organization, I necessarily felt like looking into your Association, and I got the report of your last annual Convention; and after reading that report I came to the conclusion that I knew very little about the brickmaking business. It is astonishing how many new ideas come from a Convention of



ELLIOT S. MORSE, Third Vice-President, New Britain, Conn.

this kind. The more of them you hold the better off you will be, both from a monetary standpoint and the various other standpoints in life. The friendships you form in the Conventions and the ideas you borrow from one another are profitable and pleasant.

I am also very agreeably surprised to find the number of ladies there are in attendance at the Convention. There is no reason why it should be otherwise. It is an old adage that "the arm that rocks the cradle moves the world." [Applause.] Now, gentlemen, I await the further pleasure of the Convention. [Applause.]

The Secretary: To relieve our newly-installed President, who is not yet in harness, I will suggest that the next business in order is the installation of the Vice-Presidents. I presume the same committee of escort will officiate. (The committee escorted Vice-President Howard to the platform.)

The President: Gentlemen, I have the pleasure of introducing to you your First Vice-President, Mr. L. J. Howard, of St. Louis.



Mr. Howard: Ladies and Gentlemen—It is a very great surprise, and as great a pleasure as it is a surprise, for me to be elected to such a position, and I appreciate the compliment very much. I have often heard that mixing things improves the quality, and on this principle I notice that the officers of the Association have been selected from the different sections of the country. I hope we will all work together, and be able to accomplish a great deal the coming year. I thank you for the honor of my election. [Applause.]

The President: Gentlemen, I have the pleasure of introducing to you your Second Vice-President, Mr. William Conway, of Philadelphia.

Mr. Conway: Gentlemen, I thank you for the honor you have conferred upon me. I have attended a great many of the Conventions of this Association, but I never thought that it was going to end in my getting into such a scrape as this. [Applause.]

The President: Gentlemen, I have the pleasure of introduc-



T. A. RANDALL, Secretary, Indianapolis, Ind.

ing your newly-elected Third Vice-President, Mr. E. S. Morse, of New Britain, Conn.

Mr. Morse: Mr. President, Ladies and Gentlemen—I thank you very much for the great honor you have conferred upon me. I hardly feel able to undertake any office, but I will do the best I can to assist the other officers. I thank you. [Applause.]

The President: Now, gentlemen, I have the great pleasure of introducing to you the man whom, so far as I have gotten along in the affairs of this Association, I believe is the steam-maker—your worthy Secretary. [Applause.]

Mr. Randall: Mr. President, Ladies and Gentlemen—I thank you again, for the twelfth time, I believe, for this honor. I have been feeling good all this week. I got good news before leaving home, as some of you know; and the renewal of friendships here, the cordial hand-shakes and the good wishes expressed, would warm a chillier man than I am and make him feel good all the way through. Thirteen is said to be an unlucky number, but I do not think it will hold good in connection with my service to this Association during the coming

year. With the sturdy men and fair ladies whom I see before me, I know we shall go right on and up during the coming year, as we have done heretofore. I again thank you, gentlemen, most cordially, and I will do the best I can during 1898. [Applause.]

The President: Gentlemen, I have the pleasure of introducing your Treasurer, the gentleman whose business it is to see that the funds of this organization are kept in good shape, and well supplied. If he cannot collect them, it is his business to borrow them. [Laughter.]

Mr. Sibley: Gentlemen, I am not an orator, nor the son of an orator. You have honored me in this position five or six times now, and I appreciate it very much. I shall endeavor not to fall by the wayside, and hope next year to be able to present a financial report which shall be in every way satisfactory to the members of this Association. [Applause.]

The Secretary: The next regular order of business is the appointment of committees, but I suggest that, inasmuch as the President is hardly fitted to his harness, that we take that up to-morrow morning. If this is done, it will bring us to the first paper of this session—"Looking Forward," by Mr. J. C. Adams, of Indianapolis.

#### "LOOKING FORWARD."

Mr. President, Ladies and Gentlemen:—It is with a sense of embarrassment that I stand in your presence this afternoon to respond to the first number of the first session of this convention. To the sessions of our meeting I look forward with much pleasure, not only with anticipation of pleasure, but of benefit. My embarrassment is somewhat heightened by reason of the fact that I have made no preparation for this hour, nor prepared a paper upon the subject which the programme announces I am to deliver an address upon. I feel like a schoolboy who goes to his class with his problems unsolved and his lessons unlearned, trusting to luck, and to what the other fellows do not know, to keep him from going to the foot of his class.

I probably shall be, however, relieved of an embarrassing position in which I found myself a few years ago, when, after much preparation and hard work and research, I wrote a paper to be read upon the occasion of the banquet to a commercial body. When the chairman arose and announced my name and the subject to which I was to speak, I caught up my paper in my hand, and by reason of a desire to follow a few thoughts dropped by a former speaker, and moved by the combination of the many faces I saw before me, and the inspiration of my surroundings, I threw the paper I had prepared on the table and plunged out in my remarks in an entirely different direction, and made a speech quite different from the one I had prepared. The next morning I was horrified, on reading the morning paper, to find the speech which I had not delivered printed in full. I left my breakfast untouched and hastened off to find the reporter to mop the floor with him for having published what I did not say. It seems he came in late, picked up my manuscript, supposed I had delivered the speech and printed it verbatim. (Laughter.) By making my remarks extemporaneously, such an occurrence is not likely. Then, again, I have for your encouragement to tell you that I have a reputation at home of talking best on matters of which I know nothing, and discussing questions about which I am ignorant.

But, gentlemen, to look forward for more favorable conditions, for the betterment of our lot in life, for increased opportunities for usefulness, and for the enlargement of human possibilities, is certainly commendable and should be encouraged. Especially is this so, Mr. President, when the end sought to be reached should be inspired and promoted by our best aims, and the better impulses of our nature. The thoughtful and discriminating man judges the future by looking at the past. In the past he finds the object lessons of life indelibly impressed upon his mind and countersunk in his own experiences. The pessimist looks forward to the future without any pleasure. To him it is an unknown quantity, for he sees nothing in life that is worthy, nothing in the examples of his fellowmen proper to be followed, and nothing in the hopes and aspirations of life worthy of attention. He goes through life with a face like a professional mourner at a funeral; like an evil spirit spreading gloom, desolation and despondency. Nothing in nature, in the handiwork of man, or in the expectancies or hopes of the future would ever bring comfort and joy, sunshine or cheer to these typical Jeremiahs, who look at life like a child views a vinegar cruet; but it is the broad-minded, liberal man, of many sides and views, who sees much to admire in the marvelous creations of mind and matter, and the resplendent glories of human progress. To him looking forward is something more than a sentiment; it is a belief, fortified with a



hope in him, and faith of what will come to him in the end.

While occupying a seat among you this afternoon, and gently urging the gray matter in my brain to a state of activity, in order that I might give utterance to a few thoughts upon the text assigned to me, there came to my mind an incident which happened a short time ago, which, Mr. Chairman, at the risk of digressing, I will repeat. One day last September while walking around what is known as the Governor's circle in Indianapolis, in company with a friend, I overtook a little girl going in the same direction in which we were walking. There was nothing in the appearance of the child that would distinguish her from hundreds of children met daily in the thoroughfares of large cities, excepting that she was poorly dressed and had the indications of poverty. I saw that upon the child the hard and relentless hand of poverty had been placed, and that she was doomed to a life of penury and want. There was nothing more to direct my attention to her, except the fact that she was reading a book. We went up Meridian street, and came to the City Library. She turned to go in and I saw her stumble and fall at the first step. I reached down and picked her up, and my friend picked up her hat and placed it on my head. I gathered up her book and handed it to her. The title was "Looking Forward to Better Days." That little girl, as she collected her thoughts, turned to me, and with a sad voice, often heard in the children of the poor, said, "Thank you, sir; I was so much interested in my book that I stumbled and fell." She had been rudely awakened from the realms of imagination, in which she had been soaring, so engrossed was she in the literature of the subject upon which I am to speak.

I am fearful that I will also stumble and fall; but, gentlemen, we are engaged in a serious and trying business. We have much to be thankful for, yet we are met with discouragements, disappointments and vexations. I believe that nothing in this world, in the line of our business, in the professions, or any of the affairs of life can be successful without hard work and strenuous effort. But I sometimes think that the brick manufacturers have more than their share of disappointments to bear than those in other businesses. I believe the same thought is lodged in your minds many times. True, we have found one thing that is settled and fully determined upon—that no brick maker can be successful in his business unless he has a thorough knowledge of it, and is fully qualified to attend to it in every detail, and possesses a complete mastery over the most minute parts of the business. To say that the brick manufacturers are responsible for the small balance found on the profit side of his ledger is not stating the case fully. True, they have sold brick in many sections of the country in the last few years at ruinous prices. We have disposed of our brick at figures which yield scant compensation for labor and risk; and if we proceed upon that basis we have nothing but ruin and loss before us in the future. If a man sitting on the limb of a tree cuts off the branch between the point at which he sits and the trunk of the tree, he will doubtless succeed, but the success will bring a broken neck. So with the brick manufacturers of the country. If they persist in selling goods for what they cost, or less, nothing but loss and bankruptcy can come to them. Success is no part of it. (Applause.)

In considering the present, and looking into the future, we must remember that there is no business followed by man that is affected by conditions to a greater extent than the manufacture of brick—general prosperity on one side or depression on the other. It is known to all that this country is just passing through a season of industrial paralysis and industrial depression, never known to former generations. The people have attended to only their immediate wants, and business has been confined to what they have absolutely felt to be indispensable. The least demand for effect and ornamentation has been prohibitive. The erection of elegant structures has been considered a luxury, and construction postponed until such times as prosperity became more general. When a man is confined to bed, languishing, his body consumed by a burning fever, his vitality exhausted, leaving him weak in mind and reduced in strength, hovering for a time between life and death, it is not expected that suddenly he shall get up and walk the day the disease leaves his body. As it is with the individual, so it is with our nation in its return from its long period of suffering and distress.

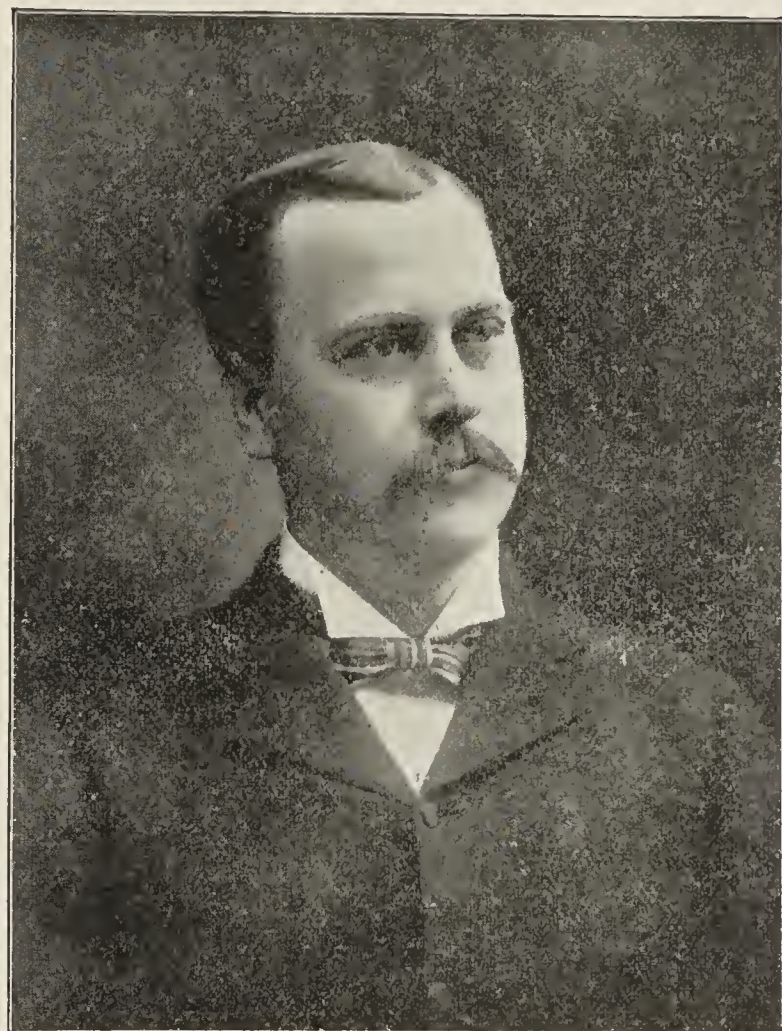
Gentlemen, I want to say to you that now we are justified in believing, from the marvelous strides the country is making to better conditions, that we are about to enter an era of prosperity and growth unexampled, and among the general division of good things the brickmaker will reap his full share. It is my opinion, Mr. President, that we are now at the bottom of the incline of industrial depression, and that we have our feet upon the ascending grade, which will bring us, under the operation of natural laws and economical processes to a future full of promise. While such is the case, and we have arrived at the turn of the road, yet in view of close competition and overproduction of clay products, we are not warranted in building our hopes very high as to the return of high prices and larger profits. In fact, such is not to be desired. It is a steady market and regular prices

that is to be desired rather than uncertain, abnormal and excited conditions, which always bring, in turn, a reversal and reaction of business.

Now, gentlemen, if you will pardon these scattering remarks, and forgive me for not offering a better reason, and for not looking into the future with a clear insight and more prophetic vision, I will not trespass longer on your time than to say that I believe I voice the hope of the members of this Association, when I say that we look forward to, and expect and hope that the future will be fraught with the fullest and best blessings for all of us who may be deemed worthy to enjoy the rich inheritance which comes to us as prominent manufacturers and members of the several communities in which we live. It is the wish of all—I know it is of the officers as well as the older members—that the new members who come amongst us for the first time, will find the time that they spend in attending our sessions full of benefit to them, and that these occasions will be among the most pleasurable moments of their business life; and that in the years to come upon us the friendships we have formed and continued to this occasion and similar occasions will be among the most enjoyable memories that come to us through life. (Applause.)

#### "LOOKING FORWARD"—GENERAL DISCUSSION.

The President: I understand that Mr. W. D. Richardson, of Shawnee, Ohio, has something to say on this subject.



JNO. W. SIBLEY, Treasurer, Coal Dale, Ala.

Mr. Richardson: Mr. President, Ladies and Gentlemen—When Mr. Adams began to speak I thought I would put my mind upon something to say when he got through, but he was so interesting that I found I was following him, not thinking about what was to be said afterwards. The question of looking forward to the future in the brick business is something that has been brought under various headings in nearly every Convention, and of course we always come here looking forward to the future of our business—the brick business especially. Last year, at Buffalo, I remember that a great deal was said about the future of our business, and after passing through a few years of depression things began to look brighter, and we thought that the coming year was to be one of much larger progress than the past four or five years. This year we are again looking forward to a more prosperous year that is to come.

In looking at this question of the future of the brick business it comes to my mind now in two ways. First, in regard



to the possibilities of the art of brick manufacturing. We are just about entering into a new century, and no doubt that century is to be an age of clay—an age of brick houses and brick streets; and we know that the brick industry will be one of the most important industries in the country in the coming century. They must, in the coming century, build almost entirely of clay, the only inexhaustible and indestructible building material we have. The development is going to be not only in the line of a larger use of clay products, but also, no doubt, in an improvement in the manufacture of brick. We cannot think, in looking backward over the past few years, that we have reached anything like perfection in the manufacture of our products, so that, as regards the improvement of the industry which we represent, we look forward to a very bright future. There is no question about this. But, secondly, there is another side of the question in which we are perhaps more directly interested, and that is—Is the future of the brick industry to be more profitable? That I cannot see so clearly ahead. In looking back at my experience of the business for the past fifteen years, there has been in the face brick busi-



J. C. ADAMS, Indianapolis, Ind.

ness, in which I am interested more especially, a period in which there was large profits for those who were the pioneers in the business. There was a time—ten years ago—when the face brick business was very profitable and those engaged in it were paid good prices and there was a vast field. But in the last few years so many have gone into the face brick business, and so much capital has been invested, and competition has become so sharp, that the profits in the face brick business have become very small, and it has been as difficult to make profits in that business as any other, even more so. As to the paving brick business, we can remember that the beginners in that business a few years ago made large dividends, but I think those engaged in it in the last three or four years would say that the profits are not greater in the paving brick business than in any other legitimate industry.

Looking forward as regards the product of the brick business, I cannot see any conditions in the future which are going to make the brick business any more profitable than it is to-day. I expect, of course, in the coming year, and perhaps

in the years following, there will be better business conditions, and perhaps a little more money to be made, but it will not, so far as I can judge, be a very profitable business. It will be as profitable, perhaps, as any other well conducted business. I do not want to speak in a discouraging way, but I cannot see anything in the future business that will be an encouragement to those who are looking forward to the investment of large capital in new enterprises of this nature. In speaking upon this subject, I could not but mention that fact. I believe that the future looks very bright for extending the use of clay products and of brick for building material; but, as regards the profits of the business, while there is nothing especially discouraging about it, at the same time I cannot see that there is going to be any great field in the future in the brick business as concerns the profits. [Applause.]

The President: I will ask Mr. George M. Fiske, of Boston, Mass., to address the Convention.

Mr. Fiske: I am not prepared to speak on this subject. The Secretary came to me a moment since and said I would be called upon. I have not given the matter any special thought. Of course it is a subject I have given thought to, for who is there in the brick business who does not forecast the future? I believe in the future of the clay business. [Applause.] I am not so sure about the profits in the immediate future, but these things regulate themselves. We have seen a peculiar condition of things the last few years—a very large over-production, and the consumption has almost stopped entirely in some of our markets, compared with what it was a few years ago, and of course the natural and inevitable consequence has been a large stock and over-production. This is so bad, that if there is a market taking a few brick, everybody rushes there and wants to get a part of the order, and the consequence is that the prices are away down. For the last six years the price of brick and clay products have been going down, down. Six or eight years ago we said: "Well, this is the lowest price we will have to sell goods at, we have surely gotten to the bottom," but every year since they have gone down, down, and '97 was lower, and '98 will be still lower in many markets; but for all that I do believe in the future of the clay business. I sat here this afternoon listening to this discussion, I happened to think of Old England. Why, just see what the clay industries in England are to-day. There has been competition there for years and hundreds of years, longer ago than we know anything about in this country, and yet there has been money in it, and there is an enormous demand to-day, and new enterprises are started in Old England to-day, new plants are being developed for the manufacture of common clay, as well as the higher grades. I imagine that there is profit in it. We have been a little frightened in this country upon this subject, to see these numberless companies starting up for the manufacture of brick; companies starting out with large capital, perhaps watered, going in with the idea that they are going to sweep everything before them, and we felt a little shaky; we didn't know but what they would do it. In almost every case we did not find that it lasted long. They found there was no money in it for any such large amount of capital. If men will only be sensible and look around they will find the companies making money are those working on small lines, and not large and unwieldy capital. Whereas, a few years ago, as I said before, we were frightened about the great number of companies that were starting up, many of those are lying idle to-day and their bones are bleaching on the sands all about us, and many of them are not likely to be revived.

But yet it has been up-hill work for years, hard to make a dollar in it; and if you make a dollar in one way, you lose it in another. In our markets—and I find it so in other markets—we have had better business, but more loss, more failures in the business, the financial character has deteriorated; and whereas we have worked hard and made a little money, we have lost it in some bad debts; but that will regulate itself.



We in the East have been hoping that the yards would start up and make a large supply of clay goods, because a great many of the Western factories have been looking to the East for their outlet for the product, and the consequence is that prices have been much depressed. I make some bricks, but not many compared with what I buy and sell; but I find that there has been depression everywhere.

I believe in the clay business. Think of the tremendous strides which have been made in the last fifteen years in the methods of producing clay goods and the great variety that are made. There is one thing I have spoken of before in these Conventions, and it is something that will amount to a good deal, and that is the hollow clay block for building purposes. I believe it will come, and we will see entire houses built with clay blocks in an artistic and practical way, the very best kind of houses; moderate cost houses that workmen can afford to live in. It needs study and development, but there are those who are giving it this, and the time will come when we shall see it. I therefore believe we have nothing to fear about the clay industries in this country. There is a future to it—far higher and far above what we have seen yet. [Applause.]

The President: I am requested to call on Mr. W. H. Copeland, of Warren, O.

Mr. Copeland: Gentlemen, I am not a public speaker, and I have only a slight experience in the brick business. A brickmaker should live at his plant, and have a constant hourly supervision over the works. If he does not it will not be profitable. My experience has not been profitable. I believe there are too many brickmakers in the section of the country where I am located. There have been ten new works started since we went in. There were enough before—in the northwestern corner of Pennsylvania. The province of the brickmaker now-a-days seems to be to undersell his neighbors.

Mr. James Taylor, Fort Monmouth, N. J.: Gentlemen of the Convention: I have received a key-note in the remarks that have been passed before the Convention by the last two speakers; the last three speakers, I might say, but the last two certainly. They used a word that I have an absolute horror of hearing, and that is the word "over-production." To use that word "over-production" before a body of men like this, whose object is to know how to make brick, how best to make them, and how to make more of them, is to turn your back on the future. It means something selfish. It is as if you said: "I am not going out of the business. I am not going to stop manufacturing, but there are too many bricks being made, and some of you fellows will have to quit. I want to make my bricks, but some other fellow ought to quit." Gentlemen, as long as we approach this subject from that side, we shall never make any progress. The question for us to consider is: Why do not the people buy the brick? That is the question; that is what we want to take hold of. What is the matter with the market; what is the reason that people do not buy our brick?

Mr. Fiske says that he looks back to England. He can look to Germany, too. These countries used brick before Columbus discovered this country. They have carried on the clay industry on the same spot in Staffordshire for centuries, and yet they are hundreds of miles away from the clay mines, but they are in the coal county. For centuries they have manufactured clay goods there, and they have a good market to-day. What any nation has done, although I am a foreigner, I am willing to admit that Americans can do it and do it much better. [Applause.] There is no reason for any man, there is no right for any brickmaker to say that there are too many bricks made while he lives in a wooden house. He picks up the daily newspaper and sees the terrible disasters that come to life and property by destruction from fire; and yet people will turn around and on the same spot build the second and third, aye, even the fifth or sixth wooden house. The conditions of nature will compel us by and by to do the same as has been

done in Europe. Lumber is becoming so dear that they will have to build of brick presently. Now there is a point I want you to get down to—find out why the people do not buy your brick. It is not the price. There is a reason for it, and the man who studies the reason is not a pessimist, but an optimist, looking further ahead than the man who says that another man should shut up his yard, so that the first man can sell his bricks. It is too much of a subject for me to touch upon, except in a light way; but before the Convention adjourns I may have something more to say. Incidentally, I will say that I believe we have been making a mistake in making the same kinds of brick that our forefathers made. There are different conditions to-day; the arts and sciences and all the surroundings of life are different, and there is a basis of foolishness in taking seventy-two cubic inches of solid earth to make a brick. [Applause.]

Prof. Edward Orton, Jr.: Mr. President and Gentlemen: I do not know but it may be presumptuous for me to speak to this Association of practical brickmakers on this topic, because,



GEO. M. FISKE, Boston, Mass.

as you well know, my money is not invested in a brick plant, and I am not practically pursuing the business, and have not pursued it except as I have been retained to make experiments; but it seems to me in the remarks of some of the gentlemen who have preceded me on this debate that a feature has been brought forward which is worthy of a little further consideration. I think it was Mr. Richardson who showed most clearly the enormous extent to which in the nature of the case the clay industries must expand as this country grows older. Our forests are being denuded at a frightfully rapid rate. None of us, except those who have considered the question, have any idea of the rate at which our timber is being cut away. Iron and clay, in the nature of things, are bound to replace the enormous use of timber which has prevailed in the past, and that means a constantly greater increase, a disproportionate increase, in the use of clay wares over that which prevails to-day.

Now, then, changing my argument a little, I wish to borrow a parallel from the iron industry. When I first graduated from school I followed the iron industry for about five years,



and I got pretty well acquainted with certain features of it. I well remember when in southern Ohio, there existed a large district called the "Hanging Rock Iron District." It was composed almost entirely of small charcoal furnaces, making a fine grade of charcoal iron from the local ores of the Lawrence county hills. They got the wood from the same hills, and also their limestone. When the iron was floated down the river to Cincinnati, and there marketed, it was a purely home product of that county. What is the condition to-day? I do not think there is above two or three of the thirty or forty furnaces now running. They stand idle by dozens. Why, gentlemen, was such an industry smitten? Well, we are here, at Pittsburg, and the answer is not far distant. Go up the river to Duquesne, see one furnace there capable of making in one day what the entire district could hardly turn out in a week. There is the answer. These people here have fitted and equipped themselves to make iron. They have applied to the business of making iron every facility which mechanical and metallurgical ingenuity can direct. They train themselves for the art of making iron,



F. L. STILES, New Haven, Conn.

and the result is that they are making iron for the United States and other countries as well. They have extinguished the little charcoal iron furnaces and extinguished dozens of other local industries throughout the country. How is it to-day? Is there any use of a small industry starting? Is there any use of a small blast furnace beginning operations at a local point? Not very much. When the old ones cannot keep running, there is not much use for new ones; but there have been new industries started. What were they, and how did they start? They started at the top. Neither money nor brains were spared in the newer metallurgical plants; and unless the newcomers see their way to make a ton of iron as cheap, or cheaper than their competitors the first week of their start, they had better stay out of the business; and yet it has been demonstrated that industries can be built from the foundation up and start on such scale. Now, let us take this lesson to our brick business. There are many old plants—the remains of by-gone years. Ill-prepared with shale, or poor or medium clay deposits, how many such plants are in existence? You can all count many such in your districts, and it is the product of such

plants that are always having the most difficult time in their sale. They feel the hard times. There is always room at the top. I believe it possible for a brick plant to be built to-day if proper attention is paid to the location and the clay, with proper mechanical facilities and processes of manufacture, it is possible for such a plant to be built to-day, and in the face of such market conditions as we have to-day make money from the day it starts; and I think that there lies one prominent thing which you must consider in looking forward. You must rejuvenate and build up your plants along that line of policy, if you expect to stay in the business and look forward; you must adapt yourselves to the new conditions. [Applause.]

The President: We should be glad to hear from Mr. Frank L. Stiles, of New Haven, Conn.

Mr. Stiles: Mr. President and Gentlemen: I did not expect to say anything on this subject, and it would be better if I did not. I have been accustomed to calling a spade a spade and a shovel a shovel. I have been interested in all the remarks made here. Mr. Taylor remarked that he did not wish to have us talk about over-production and the old trouble of supply and demand; and I regret that I must differ from his conclusions. This condition confronts most of us, if not all of us, to-day. The people who are lucky enough and learned enough to be dealing in clay materials, outside of the regular common brick, may be all right, and it may be that there is no over-production in their commodity, and if there is none and they are having a good sale, they are not only living in God's country, but they have a good business. On the other hand, if you are living in the best of the country and have every facility and one large plant, as Professor Orton says, and it is shut down very little, I do not think it is possible to-day for the common brick men to produce all the brick their plants are capable of producing and not over-produce the common brick and make the price of our manufactures go down. It is a good thing to look at a thing as it is. If we are over-producing, there are only two ways in which we can help ourselves, and that is what we come to our Conventions to do. One way, which is probably the better way, occurs to me in the matter of the quality of our material. I will go back to the great Boston fire. In the face of the fire the brick walls stood all the time through that hot fire, and showed that there is nothing in the world to equal clay for fire-proofing and general building material. The fire told severely on the granite, stone and iron, but when the brick got into the fire they had struck home and were all right. That shows that we are on the right track and have the right thing. To go back, it seems to me there are only two things—the best is, perhaps, what Mr. Orton spoke of, to do something to make more of a consumption of our brick. If we can do anything of that sort we are helping one another, and we will all live. Another way is to find other portions of buildings that may be constructed of clay, which will make a demand for our clay wares other than common brick and face brick. There are men here, perhaps, who have head enough and brains enough to devise some additional ways in which clay materials can go into buildings, perhaps in the way of hollow brick; or we might go still further and build an entire structure of clay. Then we can find a demand for our products. If we make only common brick and live in a locality where they only use one hundred million a year, and we produce two hundred million a year, one thing is certain, if we do not find something else to put the product into, we must stop the production until the demand calls for more. If we divide it, we can all get a living; if we do not, we will be selling brick down, down every year, as we have been for the past five years, and there will be no way to make a living, except to get into the hotel business, as our "Four-year-old" has done. When I came to this Convention for was for you gentlemen to tell us brickmakers what we have to do, and how to do it to better our situation as we find ourselves to-day. [Applause.]

Mr. W. D. Gates, Chicago: The Secretary came up to Chicago and served notice on Purington and I that one Chicago



man would be enough to talk at this Convention; and Purington, following his custom, flipped a quarter with me. Purington either carries a rabbit's foot or I have seen but one side of that quarter, and that is the wrong side. When he flips the quarter I am always "it." I have spoken about looking forward at every Convention; I have used it in my business. I have looked forward for thirty, sixty, and sometimes ninety days. [Laughter.] The last speaker said something about over-production. Now, I want to know if there is a man in this house who has worked hard, or worked any with his congressman, to have his material put into a government building. This government is constructing a varying amount of buildings, very large in the aggregate, buildings in which the best material that is known should be used. And yet in a very large proportion of those buildings stone is used. Now, if we have an over-production, is not it as well for us instead of simply shutting our mills and giving up to try if we cannot enlarge the use of our material and work on the selling end and push and pull strings to have our material used where we know it ought to be used? And we can do one other thing,—perhaps go into some other lines and increase or better our output as we have done for many years. One thought that came to me while Mr. Stiles was speaking in that regard is something I have run across. There is quite a little demand for fire-proof homes. Men are beginning to say, "I put my desk and private papers in a fire-proof building, so that when I go away at night I will find them there in the morning; but when I leave my home in the morning I leave all I love best on earth in a destructible house. I put my loved ones in a destructible house to sleep, and do not know whether they will be burned to death before morning." I think if we work on these lines, and push out and increase the use of a material, which we know is the best material on the face of the earth, we will be doing the right thing. [Applause.]

Mr. Evans Jones, Pittsburg: I regret very much that it is not some other gentleman who is called upon to talk to you on this occasion. There is one thing I can say. There was a time when they asked Webster what they produced in his State, and he replied, "Men and women." I can say that they produced men when they produced the brickmakers who compose this Association to-day. There is a question here, and a few remarks of some of the gentlemen struck me quite forcibly, and that is the question of over-production. My experience in the brick business is limited; but I want to say to you, from my limited knowledge of it, that there is less attention paid to the brick business than any other business I know of. I know of no material for building and for general construction that equals burned clay. [Applause.] I have, in a crude way, given this matter some little attention; and I want to say to the brickmakers here, if they would use but one-half the energy, and one-twentieth part of the expense that the iron industry has in replacing wood, that there would be a very large production of brick demanded. It is but a few years ago that in our country here there were nothing but wooden structures. To-day you can drive for miles and you will find that not a single one remains. I can remember in this town a few years ago that there was nothing for foundations but stone. They thought of nothing else, but now there is hardly anything else than brick put in, because it is much better than stone or any other material that they can put in. I believe if the same amount of energy was used and the same amount of money spent, I think you would increase your production rather than diminish it. We had a discussion here some time ago on the question of sewer pipe, and some of the parties condemned brick sewers. This was because the parties who put them in did not know how to construct them. If one brick sewer is not good, that is no reason why they should be condemned because they have not the right kind of material. All that I have to say, Mr. Chairman and gentlemen, is that I believe you can increase the use of brick from fifty to one hundred per cent. if the same energy is used. I did not come here to make any remarks, and I

have very little experience in the question of making brick; but I congratulate you all, gentlemen, and hope you will have a good, pleasant time with us. [Applause.]

Mr. J. H. Chambers, Philadelphia: I am not a brick manufacturer, gentlemen, and I feel that I should offer some apology for speaking on this subject, but my business brings me in contact with brickmakers, and while I have not noticed the state of affairs in New England, where Mr. Stiles manufactures, yet in many parts of the country it is true that the manufacturer of common brick suffers a loss through waste; that is, because of imperfect processes in the different parts of the manufacture. During the past year there have been many manufacturers utilizing and selling that which a few years ago they allowed to go to waste, simply because they did not use it. Competition and study of these matters has shown them how to convert that waste into profit. There is undoubtedly, in many parts of the country to-day a large waste growing out of defective methods and imperfect processes of preparation and manufacture. We want more thorough study in each separate step in the process of manufacture, and the largest part



W. D. GATES, Chicago, Ill.

of the loss complained of to-day can at least be saved by greater care in that respect.

Mr. W. A. Eudaly, Cincinnati: I want to say that I have listened with a great deal of interest to what has been said on this subject. I do not know when I have listened to a subject discussed by this Association with more interest than to-day. It occurs to me that there are two ways of looking at this question, narrowing it down to the question of dollars and cents. There are many brick manufacturers who are trying to sell their brick solely on the question of price; that is to say, they offer their brick on the market at a lower price than what may be considered the regular price. They make that the inducement for buying. There is another class who make the inducement that of quality. What I believe the brick manufacturers and clayworkers of this country ought to do is to sell their brick on quality—offer a high standard of brick—and not attempt to sell it on the low price. It is the fault of the brick manufacturer himself in a large majority of cases—the cheap price comes about because of the manufacturer himself. Let



us urge the quality end of the matter a little more than the cheap price.

Mr. D. H. Haeger, Dundee, Ill.: I will not use much time. I am not a socialist, but I will quote a phrase that socialists use: "Machinery is the ruination of our country," and no set of men have done more harm to the brick interests and prices in Chicago and vicinity than the gentleman who spoke before the last speaker. He has ruined the business more than any other man by his improved machinery. Whereas, they now have a capacity of one hundred million per year, they could not produce more than five hundred thousand in the old way. Now, if Mr. Purington will please do so, he can fill in the rest of the Chicago condition better than I can.

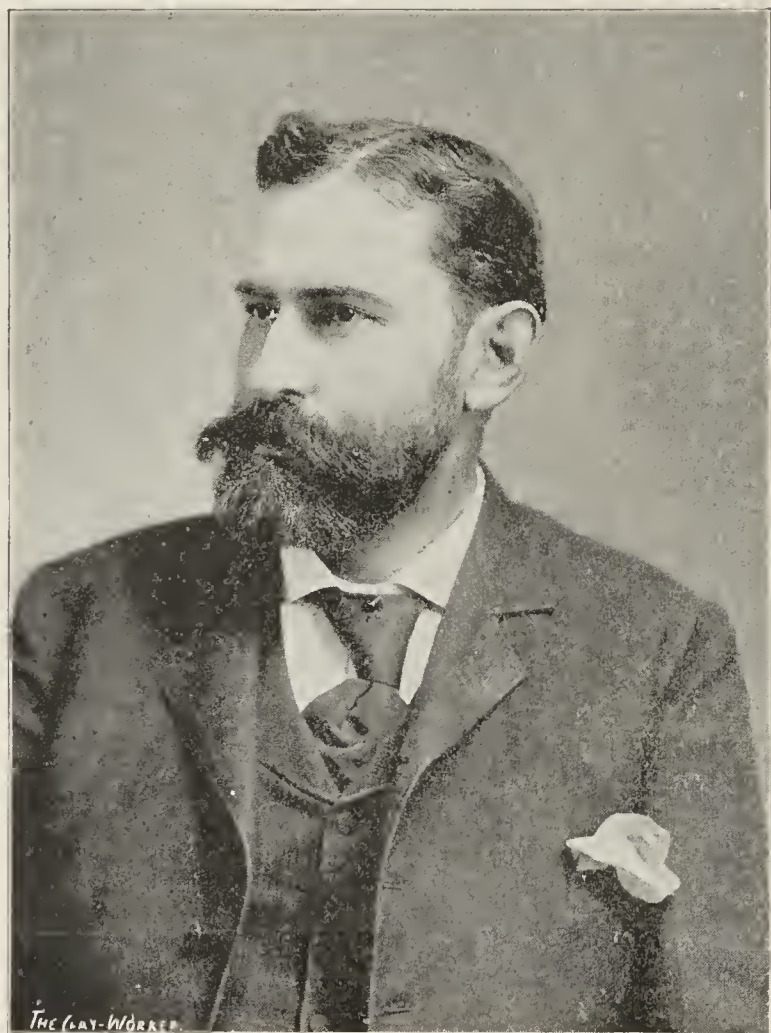
The Secretary: I am requested by the local committee on entertainment to announce that the annual festivities will take place in this room at 8:30 this evening, and all in attendance at the Convention are invited to be present.

On motion, adjourned.

## SECOND SESSION.

Wednesday Morning, February 16.

President Flinn called the meeting to order at 9:50, and announced the first business in order to be the reading of a paper



C. A. BLOOMFIELD, Brooklyn, N. Y.

on "The Use of Electric Tramways in Hauling Clay," by Mr. Charles W. Eiker, of Chicago, Ill.

Secretary Randall read a letter of regret announcing that Mr. Eiker had been unavoidably detained at home, but had sent his paper, which the Secretary then read:

### THE USE OF ELECTRIC TRAMWAYS IN HAULING CLAY.

Mr. President and Gentlemen of the Convention:

The subject of electric traction, assigned me by our Secretary, is not a new one, generally speaking, but so far as I am able to learn its use in and about clayworking plants is limited.

Following the general plan usually adopted in handling a subject of this kind, I have spent considerable time in looking up reports from various sources, but have been unable to find any reports from anyone using electric power in place of horses or steam in brickyards. I believe the Pioneer Fire-Proof Construction Company, of Chicago, with plant located at Ottawa, Ill., is about the only concern engaged in the

manufacture of clay products that uses electrical tramways to any extent, and in their case it has proven a profitable investment, as the following will show:

This company's plant is located on the hydraulic basin in the town of Ottawa, and their clay beds are about two miles distant from the works; thus it will be seen that a cheap and rapid means of transporting the crude clay is an item of considerable importance to them.

Their electrical plant was installed in 1891, and cost complete, including engine, generator, locomotive, cars, tracks, poles and wires, \$15,400. The cost of operating this road during the year 1896 was as follows, per day:

|                               |         |
|-------------------------------|---------|
| Electrician .....             | \$ 2.00 |
| Motorman .....                | 2.00    |
| Helpers .....                 | 2.75    |
| Steam .....                   | 2.50    |
| Repairs and depreciation..... | 1.50    |
| Supplies .....                | .50     |

Total .....\$11.25

The clay hauled per day, when working to full capacity, is 180 tons, equal to a cost of 6 1/4c. per ton. To haul this by horse power, using same cars and tracks as tramway, would cost as follows:

|                                 |         |
|---------------------------------|---------|
| Twelve horses, at 50 cents..... | \$ 6.00 |
| Nine men, at \$1.25.....        | 12.15   |

Total .....\$18.15

Or a cost of a trifle over 10c. per ton, showing a saving by the use of electrical power of a little under 3 3/4c. per ton, or a total saving of about \$2,000 per year of 300 working days. No account of repairs to tracks is taken in either estimate, but it is superfluous to say that if horses were used, the wear and tear would be more than doubled.

In addition to the savings shown in transportation, the company were able to dispense with gas for lighting their buildings and used electric lamps instead, which also proved a source of economy.

It may be interesting to note what others in a different line of business are accomplishing by the use of electrical traction, and I will give you a copy of the report received from the superintendent of the New York & Scranton Coal Company, as follows:

"One of the electric haulage plants operated by the New York & Scranton Coal Company is located at the tunnel opening. The cost of the plant was \$7,039.00. The depreciation per year at 5 per cent. would amount to \$351.95, or for 200 working days \$1.75 per day.

"Cost of operation per day is as follows:

|                                 |        |
|---------------------------------|--------|
| Motorman .....                  | \$1.75 |
| Helper .....                    | 1.25   |
| Electrician for two plants..... | .78    |
| Repairs .....                   | .65    |
| Depreciation .....              | 1.75   |
| Oil .....                       | .24    |

Total .....\$6.42

"The coal hauled per day is 600 tons, at a cost per ton as shown shown above of 1.07 cents.

"To haul this coal by mule power would require:

|                                 |        |
|---------------------------------|--------|
| Twelve mules, at 50c. each..... | \$6.00 |
| Six boys, at \$1.35 each.....   | 8.10   |

Total .....\$14.10

"This shows a cost for haulage by mule power of 2.35 cents and a saving by electric haulage of 1.28 cents per ton. On the 600 tons hauled per day the saving is \$7.68, and for a year of 200 working days it amounts to \$1,536.00."

I have reports from several other coal mining companies showing equally good results.

The General Electric Company have built and standardized electric locomotives to be used upon tracks from 18-inch gauge to the standard of 4-foot 8 1/2-inch of steam roads, and with a draw-bar pull from 500 pounds on a 2.2 ton locomotive to 60,000 pounds draw-bar pull on the 96 ton locomotive of the B. & O. railroad, so that you would be able to purchase a standardized equipment fitting your requirements as to speed, weights and loads that it would be necessary to handle under your special conditions. The cost of these equipments has declined steadily, same as our own products have, until now a full equipment, such as is used by the Pioneer Fire-Proof Construction Company, could be installed for at least 25 per cent. less money.

Most modern yards with which the writer is acquainted have a steam shovel in the clay bank or pit, which drops the clay into dump cars, which are switched and shifted about by horses until they reach the cable tramway running on an incline out of the pit, and in some cases to the hoppers of the crushers or pulverizers. From this the handling is done by conveyors until the brick leaves the machines. The brick are then loaded on small iron push cars and are pushed into the drying room. After passing through the drying room, the car is pushed and shifted to the tracks leading to the kilns, where the cars are unloaded and then sent back to the moulding machines or presses. In a yard so laid out it is doubtful whether it would pay to install electricity to take the place of present methods, yet I believe that the modern brickyards, of necessity, must handle their clay and brick in the most economical manner, and that where yards are situated some considerable distance from the clay pits, they work at such disadvantages that it would be practically impossible for them to compete with other yards properly installed. (Applause.)

### HAULING CLAY—GENERAL DISCUSSION.

The President: The Chair will ask Mr. Charles A. Bloomfield, of New York, to say something on this subject.

Mr. Bloomfield: Mr. President and Gentlemen—About an hour since your Secretary came to me and said that he had me on the programme to reply to this topic. Within the past two years, owing to the cutting in prices in the sale of clay wares and the necessity for reducing the cost of production and shipping to the lowest possible amount, I have given this subject considerable thought and attention. I have looked pretty thoroughly into the subject of whether electricity could be used in hauling clay from the mines to the shipping-point more economically than by steam. There is no doubt in my mind that



electricity is much more economical than animal power, more especially when I come to consider the figures as given by this gentleman. He mentions horses at fifty cents a day. Any one who has used horses knows that fifty cents a day is just about half of the cost. It is not only the question of feeding, but horses will get sick and sometimes die. They must be shod. The harness wears out. All these things have to be taken into consideration, and it is impossible, for one reason and another, to furnish horses for less than double the amount stated. It cannot be done for less than one dollar a day. Of course, as your output increases you have to increase the number of horses. I started in mining clay on the old system, in Woodbridge, N. J., hauling it by teams, but it was not long before I realized that the teamsters were getting nearly all the profit, and I was being left. I then built a tram road, three feet six inches gauge, from my mines to the Raritan River, two miles distant, and used horses to draw the cars. I found that was expensive, and about five years ago I came to this city and went to the H. & K. Porter locomotive works and had them build me a locomotive for twenty-five hundred dollars, and I have used that for five years. The cost for an engineer has been two dollars a day, a little less than half a ton of coal a day, two dollars and a quarter, making four dollars and a quarter; and allowing for repairs during the year it has not cost over five dollars a day. No day when we are working do we ship less than one hundred tons, and that would make the average cost in that case five cents a ton, and we have shipped five hundred tons a day, which brings the cost down to a cent a ton; and if the demand was sufficient, we could ship with the locomotive one thousand tons, making it only a half-cent a ton. Where you use electricity you must have an electric power plant and an electrician; and if you are to do justice to your fellow-men, you must have a brakeman or some one on the cars to control them, or some one will get hurt. You cannot keep people off the track. Where you have the steam engine, it only requires the engineer; you do not need a fireman; it takes only one man to do the work; and from my experience—and I have looked into the matter thoroughly with a view to getting the cheapest means to do the most thorough work—I have found that steam is much cheaper and can be better controlled than electricity, and I would not recommend it. Of course, there are some circumstances which would alter the case. Here in Pennsylvania and the West they mine most of the clay that brick-men use. If you have a mine and must go into the bowels of the earth, and need electricity as light, you can use the same power for conveying the clay; but even then, if the grade is not too steep, I think steam would be much cheaper.

The President: Is there any other gentleman who has anything to say on this subject? If not, we will proceed to the next paper, "Burned Clay as a Fire-Proofing Material," by Mr. W. D. Henry, of Pittsburg.

#### BURNED CLAY AS A FIRE-PROOFING MATERIAL.

Mr. President and Members of the National Brick Manufacturers' Association:

Gentlemen—It was after much thought and considerable trepidation I concluded to accept the invitation of your worthy Secretary, Mr. Randall, to read a paper on "Burned Clay as a Fire-Proofing Material," realizing, as I did, what an important subject it is and knowing I would be unable to do the subject justice. However, felt it a duty to contribute my mite, and hope in the discussion which may follow there will be brought forward such suggestions as may result in value to all and to the good of the clay industry. My endeavor will be to present only that which has been proved and is based on practical experience.

About fifteen years ago my attention was first called to the fire-proofing of buildings. At that time the business was only in its infancy. There were but two or three concerns in the United States engaged in the manufacture of fire-proofing material from burned clay. It was not long, however, until others came into the field, and like all other businesses, some succeeded, while others failed, until at the present time there are nearly ten million dollars invested in the manufacture of hollow tile fire-proofing.

Where one has attained success in the business, there have been ten made complete or partial failures, either from lack of experience, insufficient capital, or in the endeavor to operate the same factory, with the same men, making sewer pipe, brick, ornamental terra cotta and other wares in connection with hollow tile, which, in my opinion, cannot be successfully done, except the plants are entirely separate and operated by a different gang of employees.

Our leading architects, realizing that buildings must be built fire-proof, naturally looked to burned clay as the material most adaptable for this purpose. For the support of this material iron beams are used, and instead of the heavy brick and stone walls which we were formerly accustomed to seeing, we now have the steel frame buildings, with iron beams for joist; and tile (burned clay) for filling in between these joist, made hollow to decrease the weight and form a level ceiling for plastering, to form the floors and divide the building into compartments, and last, but most important, to protect the iron and steel from the action of fire, as we all know the result of iron when it comes in contact with intense heat.

We in the burned clay business hear people ridicule fire-proof buildings, and when a fire occurs they say, "There is another fire-proof building for you!" Ask these people how this building was fire-proofed and they will say (if they have investigated) it was with heavy timbers, and finally inform you it was slow burning. A slow burning and fire-proof building are just as different as a brick house is from a frame one. A building made of steel beams, properly erected, filled in and protected with burned clay (hollow tile) can be made as fire-proof as the kilns in which we burn our brick and terra cotta, or the furnace in which the iron is heated to be rolled.

The only known material with which this can be done is burned clay, that is, hollow tile or brick. Of course, this must be made properly, and if the tile is not made to cover the iron in the very best manner, and to stay there under all reasonable conditions, the desired result is not accomplished; or, if it is made so light in weight and of such a brittle character that upon the least test it flies to pieces, then it is not of the proper kind.

Tile should be made with heavy webs, with rounded corners and of a porous nature, which then affords a material not only of sufficient



W. D. HENRY, Pittsburg, Pa.

strength, but of a toughness which allows of contraction and expansion without injury to the material.

To make tile in this way means that the manufacturer must have a price which will justify him in using heavier material, especially where freight is one of the greatest items of cost, but this he seldom secures. It is usually the owner who is to blame, not the architect. The owner tells his architect he wants a building of such dimensions to cost so much. This cannot be built under a certain sum, but he thinks it can, and sometimes the architect agrees with him, knowing at the same time it is impossible, but, like all of us, he is anxious for business, and prepares plans and specifications, irrespective of the quality of the fire-proofing required, which, to my mind, is one of the most important materials necessary in the erection of a building.

The specifications call for hollow tile, but no weight is specified; one manufacturer, if responsible, has just as good a chance as another; some one of them, having little to do and anxious for work, sharpens his pencil and figures how light in weight he can make his goods for this particular job. He reduces the thickness of his webs as much as possible, cuts out one or two and possibly all of them, and he finds his weight decreased per square foot, say, for example, ten pounds. What is his saving on 50,000 feet, which is an ordinary job? It is 250 tons, which at \$3.00 per ton freight means \$750.00 without considering other savings in his manufacture.

There is no question but what heavy tile will withstand the action of fire much better than light ones. This has been proven in actual experience, of which I will speak later. The light tile fellow secures nearly the same price as the manufacturer of heavy tile, who believes in making his corners round, his tile tough, not brittle, and in every way giving a better and stronger job. This should not be any more than the iron manufacturer has a right to receive as much for a ten-inch beam, one foot long, weighing twenty-five pounds as he does for one of the same depth and length but weighing forty-five pounds.

But such is competition among the tile manufacturers themselves. And the worst of all competition is what is known as concrete, plaster



of paris, lime of teil and other so-called patent systems of fire-proofing, which have no more right to be called fire-proofing than the moon has a right to be called the sun.

However, will say here, there are very few architects who ask tile manufacturers to compete against such constructions as I have last named, as the great and learned majority will have nothing but burned clay for the purpose of fire-proofing buildings, which are to be living monuments of their skill and beauty of design.

These people of patents have nothing to lose and everything to gain; they need no capital, as the dealers supply them with their requirements in the way of necessary cement, lime or plaster of paris; the cinders are given to them for the carting, and their bills may be paid as money is received from the building.

Allow me to stop here and ask, have any of us present ever heard of a furnace, a cement, lime or brick kiln, or, if you will, the little range, fire-place or cook stove in our home being built of cement and cinders, plaster of paris, or of lime and sand? I do not think we have, and our answer is that these places, which have been named, are built of burned clay materials, from the furnace to our little fire-place at home, yet these materials which have been mentioned are put in buildings for the purpose of resisting fire. Does it not seem absurd on the face of it?

How many of us have witnessed fires and watched every vestige of combustible material consumed in a building, yet the brick walls were left standing as a testimonial to their fire-proof quality? I say again, there is nothing like brick in a fire, and everybody is aware of the fact. What is hollow tile but brick made hollow?

Examine the ruins of a great conflagration, and what do you find? You find every vestige of wood gone, glass melted, iron warped and twisted, stone and cement pavements cracked, crumbled and gone to pieces, but the brick themselves, whether in the wall or cellar of the burned building, after having gone through the hottest of the fire,



XAVIER WITTMER, Pittsburgh, Pa.

are just as good as the day they left the kiln of the brickmaker. These brick were made of burned clay.

There have been many tests of fire-proofing materials, but it is of the actual ones only of which I will speak, and as the Pittsburgh Terra Cotta Lumber Company, with whom I am associated, are manufacturers of both porous and dense tile, I can compare them without prejudice.

The actual fires which have occurred have proved much. There have been fires in many fire-proof hotels, among these the Holland House, New York City; Hotel Metropole (now the Walton), Philadelphia; Great Northern and Palmer House, Chicago; Stillman Apartments, Cleveland; and Hotels Lincoln and Henry, Pittsburgh, all of which have had fires of greater or less magnitude, some having contents of rooms completely burned out, others their cellars badly damaged, others their store rooms destroyed, and who will venture to say if these buildings had not been fire-proof they would not have been burned to the ground, yet they were practically uninjured, as the fire only got as far as one or two rooms.

The first and only fire of any great magnitude which came to my notice as occurring in a fire-proof building was the one which damaged the Chicago Athletic Club building. Quoting from the "Engineering Magazine" of February, 1893, in an article written by Mr. Chas. H. Bibb, viz.: "On the morning of November 1st, about 1:30 a. m., fire was discovered on the fourth floor, but not until it had assumed such proportions that it appeared that the building was certainly doomed. To say that the fire burned until it burned itself out sounds like a slur on the very excellent and efficient fire department of Chicago; and yet a visit to the scene and an examination of each separate floor demonstrated the fact that almost every particle of combustible material, not excepting the window frames bricked in the openings, was consumed. Such was the intensity of the heat that the surface of the fire-proofing material and the exposed face of the brick in some places on the fourth and fifth floors became fused, and the molten glass from the skylights in the courts on either side of the buildings ran down the walls like tallow grease. The chief of the fire depart-

ment, in one of the newspapers, was credited with saying that he never saw a hotter fire than this very modern fire-proof building."

"The result to the building has been the complete destruction of the costly and beautiful front above the third floor, and, as before stated, the destruction of all interior finish in place and otherwise of both wood and plaster. It goes without saying that all iron piping and electric wires suffered the same fate. Here, however, the damage ceased. In its structural entirety the Athletic Club building remained apparently intact. The tile arches of porous terra cotta, set according to the very latest adoption of construction, namely, the 'end construction,' are practically uninjured by the combined action of intense heat and tons of cold water; not one arch has fallen, and the recent tests made on the worst looking arches developed a sustaining capacity of 450 pounds per square foot, without sign of rupture.

"The partitions, also of the same material, were practically intact, and as originally built, except that every door, door-frame and casing, and all base, wainscoting and wood work of all descriptions entirely disappeared, and the plastering was completely stripped off, leaving the tile bare. The wood floors were entirely consumed, and in many places the strips bedded in the concrete to receive the floor were burned completely through."

For information to those who are not familiar with this fire, will say that at the time it occurred, this building was in an incomplete condition. There were many thousands of feet of unworked lumber, which was to be put in place, piled on the different floors. Many of the most elegant rooms were to be, and had been, lined and panelled with hard wood finish, and this was what fed the fire. The tile arches in this building, after having gone through this severe test, remain there to-day intact.

My attention was next called to the fire in the Manhattan Savings Bank building, New York City. This building I personally visited after the fire. It was not a fire-proof building in the strict sense of the word as we erect them to-day. It was constructed with heavy iron girders, which were left uncovered and exposed to the action of heat from a fire which might originate from combustible material stored in the various floors, or from a fire occurring adjacent to the building.

A fire broke out in a building, not fire-proof, across a narrow street. This building was completely burned to the ground, setting fire to the material stored in the upper floors of the Manhattan Savings Bank building. The heat from both being sufficient to heat the exposed iron girders on the upper floors to such a degree as to warp and twist them, which caused them to let go, falling on the floors below, which had sufficient strength to support them, and there the damage practically ceased; all the lower floors being almost uninjured, except from the water which was thrown into the building.

Had these girders been protected as they should have been, the damage would not have exceeded a few hundred dollars. As it was, the damage was but slight, considering the magnitude of the fire in the building in which it originated.

The next fire which occurred and the most severe test ever given to fire-proof construction, was the great Pittsburg fire of 1897, the loss amounting to over two million dollars. I will not attempt to go into the details of this fire, as Mr. Corydon T. Purdy, a very able engineer of New York City, has written fully on the subject, and am quite sure you can secure a copy of his paper, which was read before the American Society of Civil Engineers, New York City, November 3, 1897.

I will only relate the results of this fire. It proved beyond doubt to those who have investigated the matter with due diligence, that buildings can be made fire-proof. This fire originated in an immense grocery warehouse of wooden construction. Directly opposite was the Horne office building, the contents of which were almost entirely consumed, there being but a few rooms where the fire did not have full force. In the store rooms and in the majority of offices, the floors and floor strips—which were buried in cement concrete over the tile arches—were burnt to ashes. In fact, everything combustible was consumed: glass melted, and the heat was most intense, and the concrete over the tile arches, composed of cinders and cement, was one mass of rubbish.

This building was built with hollow, semi-porous tile, of the end construction type, with thick webs and weighing probably thirty-five pounds to the square foot. Yet the tile floors of this building were not destroyed, and out of about fifty thousand feet of arches, there were but three hundred feet replaced. The iron remained intact, and the only damage done was to the combustible material contained in the building, and to the front of the building, which was partially composed of stone.

To the left of this warehouse, and almost opposite, was the Horne store building. This was built with hollow, dense tile, side construction arches of exactly the same depth. It is well known that the damage done to this building was by reason of an immense tank falling from the roof, carrying with it as it fell the iron and terra cotta. This unquestionably shattered the arches throughout the building by reason of their brittleness and light construction, as I do not think these tile weighed over twenty pounds to the square foot and had but one thin web running through them. This building has been rebuilt with end construction, porous tile, of a heavier type, which shows that the owners and architects are believers in fire-proof construction of burned clay.

To the right of this warehouse was the Methodist Book building. It was but slightly injured, not having come in contact with the fire like the other buildings; the two top floors being the only ones which received much heat, and these not sufficient to burn out all the combustible material in the rooms. Yet the arches in these floors were sagged several inches.

The people who did this work claimed these floors were put in place in that condition. Not knowing whether such was the case or not, will leave the matter for my hearers to decide, but this I do know, to support these floors it was necessary to put several iron beams underneath them, although, as I have already stated, the combustible material in the rooms below was not consumed; even a calendar hanging on the wall was not injured, and the chairs were barely charred. This was one of the so-called "patent systems" and an attempt was made by these people to advertise themselves by this fire.

In conclusion, will only say that I sincerely hope the manufacturers will use their energies in having hollow tile used in all classes of buildings. By this means we may be able to get rid of our over-production. The additional cost of fire-proofing buildings over the old wooden construction has been very greatly reduced in the past five years, and to this end we should all work, as it is not alone the modern office buildings which should be protected from fire, but our homes as well, and of this we may be sure that the use of burned clay as a fire-proofing material will increase day by day as it has done in the past and is now doing, and will soon be second only to brick in the construction of buildings.

#### FIRE-PROOFING—GENERAL DISCUSSION.

The President: We will open this discussion on this topic



by hearing from Mr. George M. Fiske, of Boston. I will say to any of the ex-Presidents or Vice-Presidents who may be here, it will be an accommodation to me and please the Convention if they will take seats here upon the platform.

Mr. Fiske: Whatever I have to say must be impromptu, for I was only spoken to on this matter a few moments since. My knowledge of the fire-proofing business has come, not in connection with the manufacture of material, for I am not a manufacturer of that class of goods, but from observation in connection with the furnishing of this material, or in contracting for putting it in place in buildings, buying the material from other parties. This paper, to my mind, is an exceedingly valuable one. It is presented by a young man who has given his entire life work to this one thing—the production and use of fire-proofing. He is not running off into three or four lines of clay manufacture, but is giving all his thought and attention to this particular line, and it certainly is worthy of it; for while the common fire-proofing is one of the cheapest lines of manufacture, so far as the price per ton is concerned, yet the use of it is a very important matter and requires an engineering skill and architectural knowledge, and a deep and careful study of conditions under which it is used; and so important is that one thing, that the very fate of this line of manufacture hangs right there—the use and application of it. It is very evident that such study has been given to it by the author of the article we have just heard read.

In our own city of Boston, within the last two or three years, cement floors have obtained quite a hold. They have not been introduced in New York City, but in Boston the door has been opened wide and they have come in and taken a great deal of business. They are cheap, most of them, and worked skillfully by those who are advocating them; they have succeeded in putting them in quite a number of buildings. Time must elapse before the public, perhaps, can be convinced as to whether or not these floors are worthy of the name of fire-proof floors. Of course, we know that cement will stand a good deal of fire, but there are certain disadvantages in connection with its use which architects and owners do not always consider—the great weight of the cement. The fact that there is a large mass of wet material put in which is going to take a long time to dry out, and in drying out will show itself for years, perhaps, in the staining of the ceilings, etc. My own idea, in regard to the best kind of fire-proofing, so far as I have observed and given study to the matter, is that it should be a porous, or, at least, a semi-porous material. I believe that is far superior to the hard and solid; that is, when you come to the test of fire. Of course, as long as there is no fire it is all right; but what it is put in for is to stand the test of fire, and unquestionably every one familiar with clay products knows that a porous body will stand the action of heat and water combined far better than a hard one. In many cases a hard body is absolutely unfit and nullifies the purpose for which it is put in there. It seems to me the end construction is the best in every way, so that my idea would be that an end construction, porous, or semi-porous, would be the very best. I know that the red-brick clay stands fire. I do not know that it is sufficiently fire-proof to stand all the tests. We do know that in some of those buildings there is an intense heat produced, and we all know that a fire-clay will stand more heat than a red-brick clay. I do not know that I have anything further to say just now that would be of any particular interest, and I will therefore consider that I have just started the discussion. [Applause.]

Mr. James Taylor: Mr. President and Gentlemen—I am very glad that once again this matter of fire-proof construction, or burned-clay fire-proofing, more properly, has come before the Convention. One great reason is that the architectural builders and civil engineers of the country are evidently watching what the Brickmakers' Convention is doing. One of the oldest advocates of burnt-clay fire-proofing among the architects of America to-day is Mr. W. L. B. Jenney, of Chicago, a gentleman whose acquaintance I made twenty-seven years ago. The firm

was Loring & Jenney. Mr. Loring has probably made more study of this matter of fire-proofing than any five other architects in the United States. In fact, he is an enthusiast on the subject of fire-proofing. He will go for our friend Henry when he comes, because he is a man who advocates slow combustion fire-proofing.

What I got up to say is this—that W. L. B. Jenney was requested by the fire insurance underwriters of Chicago to prepare for them a paper on this very subject of burned clay for fire-proofing. The paper is very interesting. I am pleased to tell you, gentlemen, that the discussion and diagrams that took place at the Buffalo Convention last year was the chief theme of his paper. He took that up, and he indorsed everything, of course, that the brickmakers said at that time.

Another point, to show the use and progress of our Convention, is in the fact that the Arbuckle Sugar Refinery, which is to be the largest in the world, is in course of construction in the borough of Brooklyn, New York; and the architect and engineer in charge have determined upon using one of the suggestions that was made at that meeting. One of the diagrams



JAMES TAYLOR, Port Monmouth, N. J.

made you will find is numbered 2. I think that is the one. At any rate, it was one that was earnestly put before you, namely, a good-size skew back, with a short lug, and a two-inch soffit of porous terra cotta. That among the architects and civil engineers of New York has been accepted as the best plan that can be used for protecting beams. I, perhaps, ought not to have taken your time, but I am as old a student in this matter as any of you. I came away and forgot to bring two photographs for the benefit of our friend Randall, and some of my old friends—photographs of the first fire-proof roof in the city of Chicago. It was the roof of the West Side water works. I have a photograph of it taken while in course of construction, and your humble servant designed the fire-proofing and put it in place. Another piece of work that I did for Mr. Jenney was the columns of the Chicago Club house. I think they were the first iron columns made in Chicago and they were covered with porous terra cotta.

Mr. Henry: The building destroyed in Pittsburg last week had a fire-proof roof. It contained seven thousand barrels of



whisky and ammonia, and when the fire started it could not be stopped. Nobody could stop a fire of that kind; a furnace would not have stood the blast.

The President: Knowing about the fire as well as I do, I believe nothing could have stood it.

Mr. W. D. Gates, Chicago: I want to say that there are none of us but know that we have a material that surpasses all others as a fire-proofing material; and I think the whole question in this matter is in the form of construction. The problem is to get the proper construction in the use of this material, so that it will fulfill its duty. Any material, no matter what it may be, if it is not properly used will be a failure. No matter how good a fire-proofing article we may have, if the character of construction prevents its success, it will certainly be a failure; and whatever remarks I made a year ago were strictly on that line of thought. Just before coming to this Convention I met some of our fire-proofers in Chicago, and had considerable conversation with them, and urged them to come here and argue for their material, my idea being that while they are very smart men, and do much more business than I do, they seem to me at times—while I hesitate to criticise them—that they are not representing the matter to the architects as they should; they do not get close enough to the architects, because the architects and engineers using this material necessarily cannot be familiar with every detail of its manufacture, and my idea is that these two should come closer together,—that the men who understand the character of the material, and knows what it will do, and how it should be used, should rub up against the man who does not know it, and the knowledge of the two men combined, that the material may best perform the work it is intended to perform. One of these gentlemen whom I met the other day when urged he should come here and talk on this subject said, "I looked over that business you sprung on the Convention last year, and it is old, old as the hills." I have never been accused of getting off anything new in my life, and his misapprehension bothered me. I knew at the time it was old, but I said because a thing is old, that is nothing against it; an idea may be old and not be used. It may simply have been set aside. I said to him: "They are using this construction every day, and you are putting in a little, thin blade held up in such shape that the least thing will knock it down, under a beam sustaining a heavy load, in a building piled full of combustible goods." They are using that every day, and sooner or later, if that continues, there will be some conflagration in which great damage will be done, not because clay is not a fire-proof material, but because it is not properly used and is not given a fair chance.

The President: As there seems to be no further discussion on this subject, we will take up the next paper—"The Refractory Qualities of Clay," by Prof. Edward Orton, Jr., of Columbus, O.

### THE REFRACTORY QUALITIES OF CLAY.

Mr. President and Gentlemen of the Convention:

If you look up the word "refractory," you will find "stubborn, perverse, unmanageable and difficult of control." Now, judging from the tales of woe which I have heard at this and preceding Conventions, I imagine that if I were to put this question to the house, "Resolved, That clay is the most refractory material known," that it would be adopted enthusiastically. But if we were to agree so peaceably on this status of clay, I should have nothing to talk about. Now, if you look a little further down in your dictionary, you will find, if it is a good one, the following apparently unimportant little note: "In chemistry, difficult of fusion." And on this point I am certain you would not agree so readily, for I have heard more than once in this body the bitter complaint of him who had placed his thousands of brick in a kiln and had found but one big brick remaining when he had opened his kiln for drawing.

But, joking aside, there is scarcely any field of ceramic inquiry over which so wide a range of difference exists, and in which so many apparent contradictions occur.

Refractory materials, then, must be considered from the chemical or metallurgical standpoint as those which are hard to fuse. But this term, hard to fuse, means so much or so little; or rather, its meaning

is so elastic, that unless one knows what material is and what the conditions are in which it has been tested, one can form almost no idea from the use of the word. For instance, we can imagine the first potter, in the person of some savage, firing his little bowls and trays in a kiln constructed of stones, damped over with the river bank clay of which his simple utensils are made. For this purpose, then, and for the soft baked wares which he knew how to fashion, the veriest mud is a refractory material. Why not? It stands the heat which his wares demand, not because it is better or different from them, but because it is in larger masses and heated on one side only.

On the other hand, let us consider a glass pot in the glowing interior of the glass furnace. What are its duties? It must hold up its own enormous weight of 4,000 pounds or more when softened by the glowing heat of the furnace. It must carry inside its charge of a ton or more of the glass batch, including strong fluxes like soda, lime and lead, which must be fused with the sand till the whole is as fluid as water. It must then be chilled down by a cold air blast till the liquid glass becomes tough and waxy in its consistency and ready for the blower's pipe. And this cycle of operations is not only to be endured once, but day after day and week after week till at last, after perhaps months of service, it fails under the strain.

A material which is required to endure white heat, to endure great weights at that temperature, to endure the corrosive action of the most active fluxes and to endure artificial cooling when white hot, certainly must be admitted to be refractory if anything is entitled to that name.

Consider one more instance—the roof and ports of an open-hearth steel furnace, in which masses of soft steel, sometimes weighing several tons, are fused like water. The heat here is so intense one can discern nothing without spectacles of thick, dark-blue glass, and even wearing these the furnace appears as light as day.

These terrific temperatures can be only obtained by the preheating of both air and gas by passing them through chambers filled with hot checker work of bricks. Where the two currents meet in the furnace, the temperature generated is that of the combustion itself in addition to the white heat which the gases bring in from the preheating chambers.

The materials which are found best adapted to this purpose are not clay wares, but are composed of nearly pure silica, cemented together by the least possible amount of some binding flux, like lime.

Even from the few preceding illustrations two things are obvious: first, that the range of temperatures to which refractories are subjected is very wide indeed; and, second, that mere heat resisting power alone is not the only necessary qualification; for the silica brick of the one case would not endure the far lower temperature of the glass pot for even one charge, while the glass pot, which cannot be corroded by weeks of exposure to fluid glass, would shrink and vitrify and probably would finally melt outright in the terrible heat of the open hearth.

In other words, we must reckon with two forces in considering the value of a material as a refractory, namely, temperature and environment. By environment is not meant the place in which the ware is to be used, but the nature of the heated materials with which it comes in contact. For instance, one cannot easily melt silica, and silica bricks are therefore great favorites in situations like roofs and ports of furnaces, where heat alone is to be borne and where nothing but gas and flame comes in contact with it, even at comparatively low temperatures.

Again, coke bricks are admirable when placed low down in the hearths of blast furnaces, where they are always covered with iron and slags; no amount of heat can affect them in the slightest. But above the tuyeres, where the air could strike them, they would last but a moment. Similarly, magnesite bricks melt like butter at the presence of any silicious slag, yet when heated with a basic slag are very durable, and if heated alone, will almost stand the temperature of the electric arc.

Already have been named quite a list of materials, used in quite a number of industries, which are all accorded a place as refractories. A review of these facts and others will show us that refractories are used practically in but two industries, namely, the metallurgical and the ceramic. The former comprises the mining, reduction and manufacture of all of the metallic products of the earth, while the latter includes the clay, glass, mortar and cement industries.

The principal substances which are of such infinite value to mankind from their use as refractories are clay, silica, lime, magnesia and carbon. A few other oxides, like those of iron and chromium, and a few materials like talc, serpentine and asbestos, find occasional use in special cases when the requirements permit or justify the use of anything, no matter how expensive, in order to attain the end in view.

It is obvious, from even the preceding remarks and the scanty illustrations cited, that the principles underlying the apparently erratic and irregular phenomena are not physical, but chemical. If sand alone will endure the temperature of the open hearth furnace with ease, yet will flow off as a black slag at an ordinary red heat when a piece of iron is brought in contact with it, the behavior of the sand in the latter case must certainly be due to the effect of the oxide of iron, and the product of this action, or the black slag alluded to, must be a compound of both sand and iron, or a silicate of iron. Such is the case, and then we see that chemical laws and chemical principles must constantly be consulted in estimating the value of a refractory material for any special use.

The first and most important of the chemical principles involved is the following, namely: that substances, in order to exert their greatest refractory power, must be placed in contact only with materials of their own chemical class, having the same affinities. To use a homely illustration, a jealous wife can usually trust her husband among other men, but when he is associated with other women, then she begins to doubt the fixity of his resolves and the vigor of his moral principles. So with refractories—do not associate an acid or negative element, like sand or silica, with a basic or positive element, like lime or iron, if you expect either to remain unsoftened by the attentions of the other.

Many other chemical principles must be applied also, where one goes far in the study of the behavior of refractory materials, but to even name them, let alone adequately discuss them at this time, would lead too far.

Now, of the list of the refractory materials named previously, the most important, the most useful, yea, the one absolutely indispensable member of the list is clay. And yet under the name of clay we have, as you well know, a list of substances as broad and as varied in chemical composition and in chemical affinities and tendencies as can well be imagined.

The meetings and discussions of this Association, if no other source of information existed, would be sufficient to show that the term "clay" may mean almost anything or everything in the inorganic kingdom, and that whatever else it means, it never means the same thing twice.

How, then, is it possible to reconcile these statements with those of a moment ago when it was stated with equal emphasis that the



environment or the company which the material kept would decide much in regard to its refractory behavior?

Without attempting to go into the matter with any thoroughness, it can be said that a clay is a mixture consisting of the mineral, kaolinite or clay substance, with a very wide variety of other minerals, having no definite aggregate composition or proportion. The kaolinite may constitute nearly the whole of the mixture or it may be reduced in amount till it becomes insignificant. The accompanying materials vary similarly in character and amount, so that it is not possible to expect to find two clays which are exactly alike in ingredients and proportions.

The kaolinite has fixed chemical and physical characteristics which are well known and sharply defined. Among the latter plasticity is the essential one, and this quantity is so important that it alone forms the means of deciding whether a mineral mixture can be called a clay or not. If there is kaolinite enough present to make the whole material plastic, we call it clay. If there is not enough, we call it sandstone, or limestone, or an iron ore, or a coal, according to which one of the mineral ingredients is the most abundant and important in its makeup.

These fundamental facts being understood, we can readily see why clays give a great range of refractoriness, for it is only reasonable to believe that each and everyone of the minerals entering into this complex mineral mass is certain to have not only its own individual pyrometric behavior, but also that it is certain to affect the pyrometric behavior of the other minerals with which it is associated.

We have before seen that some materials are bases and some acids, or some positive and some negative. And when we know that the commonest of all the associated minerals found in clays comprise the commonest of all negative materials, called silica or sand, and the commonest of the positive elements, such as lime, magnesia, iron and the alkalis, we can readily see that we have no simple problem on hand when we try to forecast the refractoriness which any given clay may exhibit.

Before anything at all can be done in this direction, however, we must, above all things, obtain a clear idea of the pyrometric qualities of the kaolinite itself, which is the soul or essence of the clay. As is well known to you all, clay substance itself, or kaolinite, as it has been christened by scientists, is a simple silicate of alumina, the simplest combination which these two compounds unite to form. Silica is the most abundant material in the earth's crust, and alumina is the next to it in the order of abundance. But while they are both present in innumerable other mineral forms, when mixed with other bases, they form together, few if any other compounds than kaolinite.

Silica and alumina are both almost infusible by themselves. We cannot melt pure silica, unless we deliberately go at it to make a furnace which will do so. It can be melted with difficulty by the oxyhydrogen blow-pipe, or it can be melted easily and even vaporized by the electric arc, but these generate temperatures which are beyond all common attainment and above all use in the ordinary metallurgical and ceramic arts. So also with alumina, which alone is a little more infusible than silica, and which nearly vitrifies at the heat of molten platinum.

But compounds of the two elements rarely, if ever, retain the characteristics of their component parts, either in fusing point or in other respects, and, furthermore, the fusing point of a compound is in nearly all cases lower than the average of its components and often lower than either alone. To this, kaolinite or silicate of alumina is no exception, though there is less difference here than any other case which might be cited. Its melting point is lower than that of silica or alumina, separately, but only slightly, for it requires a temperature nearly up to the heat of molten platinum, at which silica also fuses.

The importance of this fact can scarcely be overestimated. Consider for a moment what it means to the economy of mankind on this planet of ours. It means that the one material which has been gifted by nature with the supremely useful quality of plasticity, by which we make it take any shape our hearts desire, has also been given the power to become practically indestructible as well; that we can harden into permanence anything which our necessities lead us to model and design.

Pure clay substance, therefore, is refractory. It cannot be melted except in specially designed furnaces, at temperatures above those in practical use. But, as has been already said, pure clay substance is never found outside of museum specimens. Clays are composed of proportions of clay substance ranging from almost complete purity down to very low and unimportant amounts, and naturally their fusibility fluctuates nearly as widely as their composition.

The refractoriness of a clay, therefore, becomes a study of how these ever-varying mineral ingredients will affect each other and how they will affect the clay substance by which they are bonded together. And here the same laws come into play inside the anatomy of the clay, so to speak, as were shown to act on simple substances when heated together outside. We saw that a silica brick which could not be melted by heat alone would fail in a few moments if a basic clay was allowed to touch it when hot. Similarly, a clay which unites several ingredients in one body, each of which is in itself infusible, may fail wretchedly at a low heat when the test comes.

We must, then, observe in a clay two things, if we would form an estimate of its heat resisting powers. First, we must know how much of its substance is really composed of clay or kaolin; and, secondly, we must know what its accessory minerals are, and how much of each.

Not only must we know these facts, but we must also know how to interpret them when they are obtained. And here is the key to the whole subject, after all, in this interpretation of the effect of these different minerals on each other.

Let us consider a very few of the principal minerals which we are certain to find in almost every clay.

First and foremost comes silica, quartz, or sand, as it is variously called. This is an omnipresent ingredient of clays. None can be found which are absolutely free from it and in most it constitutes a large and often the principal part. Now, the common and accepted idea among clayworkers until very recently has been that silica is an advantage to the refractory qualities of a clay. Indeed, I doubt not that if a vote were to be had now among this assemblage that many of you, possibly the majority, would be found in possession of that idea. Indeed, it is more than likely that some of you would arise as champions of the sand and say, not without truth either, that you know of your own personal knowledge and from results of your own personal experience, that sand increases the refractoriness of your clay.

This fact cannot be gainsaid, but it will be my endeavor in a few moments to show how this apparent contradiction can be satisfactorily cleared up.

Some few years ago this subject was studied by the late Dr. Seger in Berlin, who, with that wonderful clearness and simplicity which characterizes all of his work, has presented the truth to us in a way which will never require improving.

Taking a pure white burning kaolin, which will endure a temperature nearly up to the melting point of platinum, he mixed with

it in aliquot proportions pure white silica. His mixtures had molecular formula and percentage composition shown in the following table:

TABLE 1.

| CHEMICAL FORMULE.                                 | MOLECULAR PARTS. |               | PERCENTAGE COMPOSITION. |       |
|---------------------------------------------------|------------------|---------------|-------------------------|-------|
|                                                   | Clay.            | Sand.         | Clay.                   | Sand. |
| $\text{Al}_2\text{O}_3$ 2 $\text{SiO}_2$ .....    | 1                | 0             | 100.00                  | 0.    |
| $\text{Al}_2\text{O}_3$ 2.5 $\text{SiO}_2$ .....  | 1                | $\frac{1}{2}$ | 89.60                   | 10.40 |
| $\text{Al}_2\text{O}_3$ 3.0 $\text{SiO}_2$ .....  | 1                | 1             | 81.19                   | 18.81 |
| $\text{Al}_2\text{O}_3$ 4.0 $\text{SiO}_2$ .....  | 1                | 2             | 68.34                   | 31.66 |
| $\text{Al}_2\text{O}_3$ 5.0 $\text{SiO}_2$ .....  | 1                | 3             | 59.00                   | 41.00 |
| $\text{Al}_2\text{O}_3$ 6.0 $\text{SiO}_2$ .....  | 1                | 4             | 50.72                   | 49.28 |
| $\text{Al}_2\text{O}_3$ 8.0 $\text{SiO}_2$ .....  | 1                | 6             | 41.84                   | 58.16 |
| $\text{Al}_2\text{O}_3$ 10.0 $\text{SiO}_2$ ..... | 1                | 8             | 35.05                   | 64.95 |

From this but one deduction is possible, and that is that the silica has reduced the refractoriness of the clay. And as these are not theoretical considerations, but practical trials, there seems no escape from this deduction.

Seger's further experiments showed that silica reduces the refractoriness of a pure clay even up to the proportion of seventeen mole-



PROF. EDWARD ORTON, JR., Columbus, Ohio.

cules of silica to one of alumina, or in per cents up till the free silica amounts to about 77.7 per cent. and the kaolinite to 22.3 per cent. of the clay mixture. After this point the continued additions of silica to the kaolin began to increase the melting point, gradually approximating to the melting point of pure silica, as the kaolinite becomes less and less.

It must be observed, however, that, after all, the total amount of this reduction in fusing point is not so very much in actual temperature. The whole of Seger's series, from the highest to the lowest, required temperatures greatly above that of a glowing whiteness. Indeed, the lowest point in this series is much above the fusing point of pure wrought iron or nickel, which requires 1500° C. at the least, which is a heat far in excess of that used in most of the metallurgical or ceramic industries. So that these differences produced by sand on the fusing point of a clay would be of no importance, if there were no other minerals present than clay and sand, or unless we needed for some special purpose the very maximum refractoriness which clay can be made to yield.

Unfortunately, purity is easily obtained in a series of laboratory trials, but not in practical work. We must use such clays as can be had at reasonable prices and in large amounts, and as such clays invariably contain other ingredients than clay and sand, we must look further into the matter before we allow free entry of sand into our mixtures.

To Dr. Richters, another German chemist, we owe the next important step in completing our information on this subject. In his now classic researches he showed, among other things, that while the various bases, such as iron, lime, magnesia and the alkalis, could attack and fuse even a pure kaolin at high temperatures, that their activity was very greatly stimulated by the presence of even a little free silica or sand. Now that we know this fact, it seems only reasonable and rational that it should be so. We always feel so about great discoveries after some master mind has presented them to us. For pure kaolin is a silicate of alumina, already combined before the heat test begins. Moreover, it is refractory by and in itself. The



presence of other bases, like lime and iron, is unfavorable, of course, but they do not find anything of the opposite chemical affinity with which to combine, for the alumina has already gotten all the silica pre-empted. Hence, great heat and large quantities of fluxes are necessary if we expect to break down a kaolin in this manner. But suppose there exists free silica; we now have the two chemical sexes present; when the heat rises combination will naturally ensue, as neither base nor acid are attached chemically to the clay substance. As a result a fluid slag is formed which in turn acts as a solvent to the hot clay substance. Its operation is not unlike that of a lump of sugar whose lower surface is dipped into water and allowed to absorb by capillary flow until the moisture appears on its upper surface. If this lump be tested with a knife, it is still hard and sound, though damp. If it is set aside for a few moments, it will be seen to have melted into a syrupy pool. It seems incredible at first that the small amount of water in this hard lump of sugar would exercise so important an effect. And in a clay it is equally wonderful how far-reaching is the effect of a small quantity of slag-forming ingredients under high heat.

This, then, is the one first and great law of refractory clays: "No clay can have high refractory qualities if it contains any appreciable quantity of free sand." For even if the clay contains naught else but sand, and if it will endure high heats when tested by itself, there still remains the fact, that contact with any kind of basic matter at any time when hot will result in the surface slagging and gradually wasting away, and as the dripping and flowing of the surface proceeds, new surfaces of the clay are constantly exposed to the fatal contact with bases. It matters not from what sources these basic substances may come. They may be slags, or coal ashes, or sparks of molten metal—their action is the same in any case.

This explains why so many clayworkers have failed to reach success in entering the field of fire brickmaking. Scarcely a month in the year passes in which some one does not write to ask my advice as follows: "I have a fine white burning kaolin clay and also a fine white sand. I wish to enter the fire-brick business, and would like to know how to mix these to the best advantage." They reason that clay is infusible and sand is infusible; that the shrinkage of the clay will be controlled by the non-plastic sand, and that from the two an ideal brick will result. Not infrequently they refuse to accept the above principles as true, and persist in a trial before they are convinced. There are still other reasons which cannot now be taken up, connected with the shrinkage and physical strength of the product which prevent any mixture of kaolin and sand being well received in the trade.

This law also explains why the fire-brick maker always uses grog or calcined clay for his non-plastic materials. The proper physical structure of the brick requires the use of something non-plastic, and there is but one thing fit for this purpose—that is hard-burnt clay itself. Its refractory power should be as great as that of the new materials, and hence no source of weakness is introduced by its use.

"But if sand is such a detriment to a clay, how can it be that I improve my clay and make it stand up better by using sand in my mixture?" If no one asks the question, I am certain it is in the mind of some of you. You think that according to the foregoing, silica is a kind of Dr. Jekyll and Mr. Hyde; that it is leading a dual life, or playing a dual part, at least. But such is not the case. In science we must always distrust that which appears contradictory; we must distrust the truth of our theories; I mean, not the real truth, which is probably partly masked as yet, and which we may be on the very point of finally uncovering.

It is true that silica, added to some clays, improves their pyrometric grade. But the important fact is, that the melting point of such clays is always very low indeed to start with. To make this matter fully clear requires a long story, more than your patience will permit me to give. The outline of the facts are as follows: Lime and iron and other common bases when they unite with silica under the influence of heat form more or less fluid compounds. Generally, the compounds are more fluid when the proportion of base is large and the sand small. Expressing this fact by formula, we would say, that the more fusible slags range in composition between  $\text{Ro}_1 \text{SiO}_2$  and  $\text{Ro}_1 \frac{2}{3} \text{SiO}_2$ . This means that if enough silica is present to give between one and two and one-half molecules to each molecule of lime or iron, or other base, that the most fluid silicates which these metals will produce will be made. If the silica is less than one molecule, the slag generally gets pasty and harder to fuse. If the silica is more than two or three molecules, it again becomes pasty and harder to fuse.

Now, suppose we have a very impure clay to handle; one which will fuse at low heats and which cannot be vitrified without constant loss by over-burnt and kiln-marked wares. Suppose the sand in this clay is present in such proportion as to make the most easily fusible silicates with impurities like lime and iron with which the clay is impregnated. Also, suppose that the clay substance itself is in small amount, not over 30 or 40 per cent. of the mixture. The melting point of the whole mass is therefore controlled by the melting of the slags instead of the clay. Now, let us add sand enough to make these lime and iron silicates pasty and harder to fuse. Then it follows that the whole clay will be harder to fuse, inasmuch as this is controlled by the slag-like silicates which are in numerical excess over the real clay.

The point then can be made that free sand is a fatal impurity to a fire clay, and that it will infallibly tend to reduce its point of fusion, while to a poor clay its action may be just the reverse. Also, since sand appears in an ordinary clay analysis only in the total silica, and is therefore indistinguishable from the silica combined in the kaolin and other minerals, we can only judge if a clay contains sand from the total amount of silica there.

For instances, a pure kaolin generally contains about 45 per cent. of silica all combined. If now, a kaolin is found which contains 55 per cent. of silica, we are nearly sure that this extra 10 per cent. is made up largely of sand, and hence we distrust its refractory grade.

Of the other important minerals commonly found in clay deposits, we have time to consider only five. These are feldspar and mica, carbonates of lime and magnesia, and oxide of iron.

Feldspar and mica are, like sand, derived from the constant breaking down of the older crystalline rocks and hence are invariably present in greater or smaller amounts in clays. Unlike sand, these minerals are fusible by themselves at temperatures well within the limits of ordinary metallurgical and ceramic operations. Feldspar is the more fusible of the two and it fuses alone at a barely white heat, forming a clear, glass-like mass. Mica is generally colored with iron and forms darker and less glassy slags.

The fluxing matters most abundant and most active in both of these minerals are the alkalis, potash and soda. Every common clay analysis shows alkalis; no chemist worthy of the name fails to find them if he looks for them. And since these alkalis are there and are not soluble in water and cannot be washed out, we are forced to conclude that they are present as insoluble silicates like the above.

The pyrometric effect of these two minerals is, of course, against the value of the clay. But they are by no means the worst elements we have to meet. For while they will fuse, if they get much heat, they always do so gradually and gently. They vitrify a clay instead

of slagging it. Also, since these minerals themselves contain much silica and alumina, they do not form merely active solvents for the surrounding clay substance, but merely tend to cement it together, unless they be present in great amounts.

Lime and magnesia, though occurring in clays in a great variety of compounds, are most commonly present to a detrimental extent as the carbonates or the equivalent of marl or limestone. Small amounts are found in feldspar and mica, and in nearly all silicate minerals found in the clay mixture. These are almost always too insignificant to count for much. But when a clay shows over two per cent. of either and if it boils up or effervesces with a drop of acid, then look out for trouble.

This sharp distinction between these two earths when present as carbonates and as other forms comes from this fact; that carbonates when heated to redness form free oxides and immediately are ready to enter new combinations with sand, while as silicates they are already combined and commonly gently fuse like feldspar and mica. This difference in action is further proven by the way in which all limy clays behave on burning. Until such a heat is attained as will enable the lime to slag with sand, the clay remains apparently unaffected, not shrinking or vitrifying very much, nor giving indications of its approaching fusion. But once the combining heat is reached, which is variable with the proportions, but always far below whiteness, the clay begins all at once to shrink, vitrify and fuse, and a short half hour is sufficient to transform a kiln of ordinary well-set brick to a sticky mass of worthless clinkers.

Lastly, comes iron, at once the friend and the foe of clayworkers: Like the two preceding members, iron may be present in many forms in the raw clay, and still always tend to gravitate into one form of combination before the clay becomes highly heated. Thus, while we may find the sulphide, or carbonate, or hematite, or the hydroxide, in the clay, we will still find the oxide to deal with when the heat begins to approach the vitrifying stage.

But iron exhibits one great difference from any other element found commonly in clays. It forms two oxides, one richer in oxygen than the other, which we will call for convenience the upper and lower oxide of iron.

Now, the action of iron can be less easily predicted and less easily controlled than any of the other fluxes. We know what feldspar and mica will do. They cannot act except in one way. We know what lime and magnesia will do. They cannot act in any way but the worst, and we know what to expect from them. But with the iron! Quen Sabe?

These two oxides have very different pyrometric properties. The upper or red oxide combines with silica slowly, if at all; it does not begin to combine until comparatively high temperatures are reached. In a vitrifying clay, the feldspar and other silicates will proceed gradually to vitrify the clay into a hard, stony mass, while the upper oxide of iron remains still inactive, and its red color remains.

Not so with the lower, or black oxide. It is an active and virulent flux at temperatures a good 200° C. below that of the red or upper form. It attacks sand freely, makes a fluid slag of it, which, in turn, attacks other parts of the clay until all is affected.

The crowning fact in this connection is that these two forms may easily be transformed one into the other at will, as long as they remain in the free conditions. But once the lower form combines with sand, its reoxidation is practically impossible. The means of producing this change are not difficult. Simply these: First, the lower oxide (free) will absorb oxygen from the air or kiln-gases at a red heat and assume the upper form; second, the upper form, if heated in an atmosphere devoid of free oxygen, and in which unconsumed smoke and gases from the fuel are circulating, they will abstract part or all of the oxygen from the iron, leaving it in the lower form, or even in the metallic condition.

The importance of these facts becomes at once apparent. If iron is an ingredient of our refractory clay to any extent, it means, first, that it will surely go into combination with the sand at a temperature below whiteness; and, second, that if we are careless in the firing, or if in any way we subject our clay to deoxygenizing, or reducing conditions, that this slagging will begin at a much lower point in the scale.

One last word in this connection. Clays not only contain one of these impurities, but they well nigh invariably contain them all. The amounts vary greatly, of course. But no clay can be found in which at least traces of these minerals are not found. What effect, if any, will this contiguity have on the fusing point of the whole?

It has long been held by chemists that mixtures of bases fuse at lower temperatures than any one separately. Whether this be true in studying fire-clays or not is still in doubt. But it is beyond denial, at least, that the slagging of one ingredient in a clay facilitates the slagging of the next, and that, therefore, mixtures of fluxes in a fire-clay are certain to cause fusion earlier than would be the case if each operated alone.

Thus, iron in a clay free from lime and magnesia and low in feldspar and mica retains its bright-red color and porous structure up to a temperature bordering on whiteness, while in an otherwise impure clay the black silicate of iron begins to indicate its breaking down at heats far below this point.

So far only the chemical considerations, or rather the bare outlines of the chemical considerations, affecting the refractoriness of a clay have been discussed. But, it must not be supposed that these are the only things which are of weight. The physical structure, the fineness of grain, the plasticity and the density, all exert an influence more or less marked. The manufacturing processes, also, and the structure of the product, require the closest attention on the part of the maker. To discuss these topics would require a paper in itself, but it may safely be stated that on the broad classification of a clay as refractory, or common, that the chemical principles are the ones on which we must base our judgment.

What, then, is the concrete lesson which the preceding statements give as to estimating the quality of a clay? How must one proceed to come to a safe decision? Chemists have argued and quarreled on this question for many years past. The annals of chemical literature present many a bitter polemic on this subject. But, as usual, neither side has all the right.

One faction, of which Dr. Bischof has been the champion, has been active in trying to establish a basis of chemical computation which will enable one to deduce from the analysis of a clay a numerical figure representing its heat-resisting power. In this attempt the so-called "refractory quotient" of Bischof was brought out, and later the amended version of Seger appeared.

But even these apostles of the chemical method themselves recognized finally that deductions obtained in this way must be checked by practical trial before they gave full confidence. No system yet presented, or, I may venture to add, that ever will be presented, on strictly chemical grounds, gives results which inspire full confidence in either chemist or practical man.

What is the trouble? Do chemical laws vary or fluctuate? Not at all. It is not chemistry that is at fault. It is our knowledge of its secrets. Our common analyses do not represent an intelligent statement of the facts which one must know to make a decision. For



instance, it has shown that the alkalis of a clay are largely lodged in feldspathic and micaceous minerals. Also, it has been shown that these same minerals contain also lime and magnesia and often iron. Similarly, the iron-bearing minerals comprise five or six well known universal species. And yet, in an ordinary analysis, we only know the gross amounts of silica, alumina, iron, lime, magnesia and the alkalis. No effort is made to show how these elements belong together and from what mineral compounds they may be assembled. Hence, any calculation which presumes to estimate their effect without taking into account their mineral form and their physical structure is certain to give merely tentative results.

On the other hand, what can a practical pyrometric trial do? It can tell us, without quibbling or without reservation, just what place in the refractory scale a given clay will have. By means of the Deville furnace, and the Seger cone series, the matter of fusibility can be settled beyond a peradventure. The results do not lend themselves readily to translation into degrees, it is true. We cannot say this clay melts at  $2200^{\circ}$  F., and that at  $2100^{\circ}$  F., because fusion of a clay, either in the Deville furnace or out of it, is a process which is replete with possibilities of variation and time, as well as temperature, becomes of the greatest importance. But we can say, with perfect assurance, that a clay melting at cone 35 will endure any work which any fire-clay will endure; or that a clay melting at cone 26 in one trial will melt at cone 26 in another trial.

What, then, may be asked, is the value of all this vanuted chemical knowledge if one cannot use it definitely when it is obtained? If a practical trial is needed to verify it, why not let the practical trial suffice?

To this may be said, first, that the distrust of an ultimate analysis, while it is not sure nor certain, is, nevertheless, strong presumptive evidence which rarely shows any wide deviation from the results of the testing furnace. That it comes so close to the truth is the wonder, not that it falls so much. For the ultimate analysis is, after all, a crude approximation to the real composition of the clay; and even if we knew the latter there is always the effect of physical differences coming in to modify our judgment and confuse the case.

And, second, the practical trial shows what a clay will stand by itself under circumstances most favorable. If we had no other result from which to judge and merely knew that a clay would stand cone 26 in a Deville furnace, how easily one might be led into costly errors. For, while the cone test tells us of pyrometric grade when used alone, it tells us nothing as to composition and chemical tendencies; and we might very easily apply our clay in practical use to just the one set of conditions which it could not withstand.

No; chemical knowledge has its limitations, and they are serious ones. But, after all, there is nothing to replace the facts which it tells us. Instead of condemning the analysis for not telling us all we want to know, and for giving us merely the probable behavior of a clay, we should reflect on what we should do if compelled to rely merely on what the clay actually does without any means of understanding why.

When both methods, practical and theoretical, are applied, and with the benefits of actual use as well, our knowledge seems none too full for the importance which often hinges on a wise selection of refractory clay.

Also, in the future another factor is going to enter into the solution of this problem. Hitherto we have worked from ultimate analysis. Now we can determine, at least partially, the minerals of which a clay is built up; and as time goes on and the newer "rational" analysis becomes more general we shall find ourselves making our deductions from the mineral proportions instead of the per cents. of the elements. The importance of this change is great, perhaps greater for those who handle the cruder and lower grades of ware than for those whose work is all with the best. But the clayworking public should learn as early as possible that if an analysis is worth making, it is worth making well, and they should demand that their results shall be reported according to the "rational" plan.

#### REFRACTORY QUALITIES OF CLAY—GENERAL DISCUSSION.

The President: I will ask Mr. Ellis Lovejoy, of Union Furnace, O., to lead in the discussion of this subject.

Mr. Lovejoy: Mr. Chairman and Gentlemen—Your Secretary came to me a few moments since and said he expected me to discuss this paper. I told him positively I could not do it. It would be absurd for me, perhaps for any of us, to attempt to add anything to Prof. Orton's paper. In my opinion, if this Convention produces nothing else than this paper, it has produced more than any previous Convention. I know of but one book in the English language along this line that can be used as a scientific text book on the subject, and that is a little volume entitled "The Chemistry of Pottery," by Karl Langenbeck, of Zanesville, O. I think that Prof. Orton's paper should be put into book form to be used as a text book along the line of the study of refractory materials. He has covered the ground carefully and collected and brought together all the scattered facts relating to refractory materials which we find in the study of metallurgical operations. He has included in this single paper all I got in my studies of metallurgical subjects; and a great many, and perhaps all the points, that have come up since I left school. It is difficult to add anything to it in any way. It is not a paper for any of us to discuss, but one for us all to study.

I can give but a single practical illustration of the point brought out in the paper, in regard to the effect of slag, rather in regard to the chemical character of the refractory materials. The old charcoal furnaces, as most of you know, were lined with sand-rock, fire-sand, and Prof. Orton has distinctly given you the definition of the material under which head sandstone

comes. A furnace in Lawrence county was one of this type, and the slag was highly acid and it required a silicious refractory material to resist it. At Portsmouth we have manufactured a number of fire-brick of a clay which is almost a pure kaolinite,—anything but an acid material. The fire-brick manufacturer wanted his brick tested in the most trying place, where the temperature was the highest, and the highest he knew of was the old charcoal furnaces, and he made the manager of the furnace a present of enough brick to line the bosh. The boshes would last anywhere from six months to three years when built of sandstone, but instead of putting in a sandstone bosh, they put in these fire-brick and it lasted just forty-eight hours.

Mr. Alfred Yates, Boston: I would like to ask Prof. Orton for information. Does he consider kaolin a strictly refractory clay, as there are three kinds of feldspars—soda, potash and lime—and kaolin a decomposed feldspar? The only strictly refractory clay, as I understand it, is a flint clay which is a silicate of alumina.

Prof. Edward Orton, Jr.: In answer to Mr. Yates' question,



ELLIS LOVEJOY, Union Furnace, Ohio.

I can state that a kaolin and kaolinite are not necessarily the same thing; and I think the most of my remarks in the preceding paper will be found to deal with kaolinite. That is the type of mineral which is derived from the weathering of feldspar, as Mr. Yates has said; but if the weathering is perfect, there will be found no potash, or soda, or lime remaining. There is nothing left but the hydrous silicate of aluminum or kaolinite. But in actual practice we do not find this weathering perfect, and thus we find various other minerals remaining with the kaolinite. Such mixtures constitute the kaolins of commerce. The kaolins of commerce are not any purer clay than some of the fire-clays, and even shales, which have had a very different origin, indeed. So that the fact that a material is a kaolin does not entitle it to a high degree as a refractory agent. But if it is a kaolinite, and nothing else than a kaolinite, it will undoubtedly stand a high degree of heat.

Mr. Chas. W. Hoff, Terre Haute, Ind.: I want to ask the Professor in regard to the quantity of clay and sand. I understand he refers to a test made in Germany, that clay would be harder to melt than sand. I come from the Wabash district;



I get my clay out of the Wabash bottom. We have a clay which is a washed clay; it is like putty, fine and smooth. We have another clay which is sandy. If I make brick out of the sandy soil, which is sometimes done in the spring of the year, we find it generally takes one or two days, sometimes three days longer, to burn than the clay. It does not shrink, nor does it melt. That is something that has been worrying me since I listened to the paper. You might say, that the clay comes out of the river bottom and it is not clay. I say that it is; you can pull it like rubber or glue. It is smooth and sticky as putty.

Mr. D. V. Purington, Chicago: I do not think I can add anything to what has been said as to the value of Prof. Orton's paper to the clay-workers of the United States. It will be published, and after we read it over I would not be surprised if we made it a sort of classic to be distributed among the younger generation. These papers dealing scientifically with the questions which come before us are getting altogether too frequent for us old fellows. And while this paper of Prof. Orton's has been made as clear and plain and as devoid of technicalities as possible, there is a hesitancy on the part of those of us who are not blessed with a knowledge of chemistry sufficient to be able to discuss these questions before an audience of this kind that makes us bashful about asking questions, for fear that by a foolish question we may get into trouble. It makes us hesitate to ask questions about things that we really want to know and do not quite know how to express ourselves.

Mr. Chas. A. Bloomfield, New York: There are some men who go through the world and leave behind them a reputation for wisdom. I do not propose to expose my ignorance by presuming to discuss this paper which Prof. Orton has just read. Listening to that paper has more than repaid me in itself, letting alone all other considerations, for every trip that I have made to attend these Conventions, and if I continue to do so until I have reached my three score years and ten, the wisdom that I have derived from the information which he has imparted to me will more than repay me, and not only repay me, but others with whom I am constantly brought in contact and who occasionally ask me for a little information on certain points. I am exceedingly sorry that every fire-brick manufacturer in the United States is not here with us to-day. It would to them be invaluable information, and it is my belief that had their Convention been called as it should have been to join with you here, we would have had a large number present, and I am going to make myself a missionary when this volume of the Convention reports is published to carry them under my arm and give a copy to every clayworker I am brought in contact with who does not subscribe to this volume published by our friend Randall. There are fire-brick manufacturers and fire-brick manufacturers, the same as in any other line, men up-to-date and men who are not, men who only manufacture one or two kinds of fire-brick and that is all they know about it. If they could have been here to-day and listened to the paper and imbibed the information imparted to them they would have gone home and said, "I will never miss another meeting of the National Brick Manufacturers' Association for fear I will miss what will be of service to me in future life." [Applause.]

Mr. Carmichael: Prof. Orton mentioned a term in his address, one that I have often heard quoted, but I would like for my own benefit, and possibly for the benefit of other friends, a plain exposition of the term—that is, the deoxidizing or reducing condition in the process of burning. If he will kindly favor us with that, I will be very much obliged.

#### "A REDUCING CONDITION IN BURNING"—GENERAL DISCUSSION.

Prof. Edward Orton, Jr.: Mr. President, I get so used to using and hearing that term that I rather take it for granted that other people use it in the same sense that I do, but I have had repeated instances of the fact that I am misunderstood, and I owe Mr. Carmichael my thanks for having brought out the point that what has been said has been capable of misconstruc-

tion. When I speak of a "reducing condition" some people think I mean an intense heat that is going to melt things generally, but such is not the case. The sum and substance of the thing is right here—that iron and a few other metallic oxides are capable of assuming more than one state of oxidation. I do not know whether I convey my idea correctly in that statement. Take it this way: fifty-six pounds of iron is a unit of iron, we will assume. If that unit of iron is heated under proper conditions it will take up sixteen pounds of oxygen from the atmosphere. It will cease to become a metal and will become a black, scaly mass. What have we produced? We have produced the lower oxide of iron. Now, then, suppose we heat it longer, in a place where more air gets to it, and it changes from the black form into a red variety. It has taken up one-half more of oxygen, and it now weighs, instead of seventy-two pounds, eighty pounds. It is the same fifty-six pounds of iron all the while. As I told you, it makes a great deal of difference in the behavior of the iron, whether it is the upper form or lower form, doing the work in the fluxing of clay. An oxidizing condition in the kiln is one in which there is plenty of free air, holes from the top of the fires, or doors of furnace open, or damper slots pulled out, by which free air, other than used for combustion, is among the kiln gases. If there is an excess of oxygen in the kiln, more than the carbon can take up, it stands to reason that no iron is going to be reduced to a lower condition, at least in that time. But suppose you plug up the fire-hole entrances and no air can enter the kiln, except that which comes through the fire, and it is robbed of its oxygen in so doing. If you make an analysis of the kiln gases, you will find, not free oxygen, but smoke and unconsumed carbon gases. These gases are hungry for oxygen. They cannot get it from the atmosphere. Where shall they get it? They find this upper oxide of iron, which contains a little oxygen and is capable of existing with less. These combustible gases take the oxygen from the iron and reduce it, and that is what is meant by a "reducing fire." It is a reducing fire in the sense that it has reduced a high oxide of iron to a low oxide of iron, and it may also be said to be a reducing fire, that it makes an oxide in condition to do more effective chemical work. The technical use of the term simply refers to the destruction of oxygen by means of smoke and unconsumed carbonaceous gases.

Mr. Carmichael: When we burn our clay the clay shrinks down to a certain point on the top of the down-draft kiln. When we give our forced air our foreman says he gets the kiln so that the top will not burn until he gets the heat in the bottom of the kiln. Where the fire is laid on the kiln in that way until the bottom of the kiln is burned, the top brick in the kiln will swell, commence from the lowest point of shrinkage and go up again. I have seen some brick as much as a quarter on an inch longer than the mold-box they were made in. I have seen this expression used often, this reducing heat, and I never had a clear understanding as to what it really meant. I had a vague idea about it, but there was something there I could not understand, and I thought by understanding what a reducing fire meant, I might understand why our clay acts as it does. Our brick shrinks at a certain point of heat and goes up again at a continued heat, which we try to have no stronger than the heat by which we burn the kilns down to size.

The President: We will now take up the questions for general discussion. The first is No. 5.

#### "WHAT IS, OR SHOULD BE, THE STANDARD SIZE OF ROMAN BRICK?"

The President: We would like to hear from Mr. Lovejoy on this topic.

Mr. Lovejoy: Mr. Chairman, I do not know whether I can say anything on this subject at all. I do not know that there is any standard size. The term "Roman" would imply that it was an ancient brick, but I do not know what the sizes were. So far as my experience goes, I think the approximate size of the Roman brick that are being made is one and one-half



inches by twelve inches. I have heard of other sizes, particularly one and five-eighths inches thick, but my opinion is that the majority are only one and one-half. If they are made one and one-half inch thick with a mortar-joint approaching three-sixteenths it will take just seven brick for a foot in height. If they are eleven and thirteen-sixteenths long, it will take seven brick to lay a square foot of wall.

Mr. Taylor: Many years ago I had an order to make a very large quantity of Roman brick for a system of hot-air baths, for a gentleman in England. He sent me as a sample a Roman brick taken from the ruins of the ancient Roman baths at St. Albans. This bath house was built by the Romans during their occupation of Britain in the second century and, therefore, can be relied upon as being a genuine Roman brick. It was twelve inches long and six inches wide, no allowance being made for joints.

Now, as I said yesterday, it is our duty to seek to improve our product in a way so as to extend its usefulness and thus increase the demand, therefore we must conform our modern Roman brick to the requirement of our own time. Our architects demand an exact obedience to the spaces upon this plan, and so we have to allow for the thickness of the mortar-joint. For this reason the correct size of a Roman brick ought to be one and a half inch thick less two-sixteenths inch for the setting-joint, four inches wide, less two-sixteenths, and twelve inches long, less two-sixteenths, for the heading-joints.

The President: We will now take up Question No. 6.

#### "HAVE CONTINUOUS KILNS PROVEN SUCCESSFUL IN BURNING FACE BRICK?"—GENERAL DISCUSSION.

The Secretary: We have with us one of Prof. Orton's refractory elements, and I think the Convention would like to hear from Mr. Bleininger.

Mr. A. V. Bleininger, Columbus, O.: Mr. President and Gentlemen—I have had no opportunity for observing whether front brick can be burned in continuous kilns successfully in this country. On a trip abroad I had my faith broadened in this respect. I have seen front brick burned in continuous kilns, and I mean front brick of the highest grade, shaded as close as they possibly could be shaded, and I have not seen this done as an exception, but as a rule. Take, for instance, the middle part of Germany, where as high a class of front brick as I have ever seen is produced—the brick are all burned in continuous kilns, without exception; and I think that proves that it can be done. [Applause.]

Mr. A. Ittner: I would desire to ask the gentleman a question or two. First, did he ascertain with what material the brick were burned to which he referred? Second, if the continuous kilns are of a kind that have two or three feet of little holes or chases that run down in the body of the brick, where the coal is thrown, and, if so, whether the brick which comes in contact with these holes where the fuel is fed in were not discolored, such as arch brick in common kilns are discolored by being glazed or darkened on their face? So far as my knowledge would go, I have never had any experience with continuous kilns, but with results we get in our other kilns, both common and patent, I would judge that perhaps the discoloring would take place back from these holes into which the fuel is fed for a half or three-quarters of the full length of the brick, according to the intensity of the heat used. Of course, the brick might immediately around that hole, extending back into the body of the kiln to the extent that I have mentioned, not be fit to be used for face brick. I would like to have Mr. Bleininger state if he observed those things and can give us information.

Mr. Bleininger: In regard to the first part of the question, as to what kind of fuel is used for making brick in continuous kilns, it is a very common sort of coal—in fact, a lignite or brown coal is the most universal coal in that part of Germany, the middle part. As to the character of the fuel, it could not be worse, I hardly believe. As to the kilns, I would say that the kilns used for burning front brick differ somewhat from those used for burning common brick usually, although I have seen

front brick burned in the ordinary type of kilns. The kilns differ in this respect—that the fuel does not come in direct contact with the brick to be burned. They build a partition consisting of two walls with a space between them, in which combustion takes place, so that the brick does not come in direct contact with the fuel, and hence no discoloring takes place. The brick can be burned in this way. I do not mean to say that it can be done as economically as on the American plan. I am not in a position to say that. In fact, I am inclined to doubt it. But I do not doubt at all that front brick can be burned successfully in continuous kilns. Improvements have been made in continuous kilns, in which the fire arrangement is such that a large body of ware can be set in the kiln without coming in contact with the fuel, and give more space to work in. The fire walls described make it inconvenient to handle the brick. It is not as easy to set and to empty the kiln. The most promising kiln is the gas kiln, in which the whole question is solved by using fuel gas, which does away with the ashes.

The Secretary: The kilns which you refer to are fed from the top or sides?

Mr. Bleininger: Top-fire kilns.

Mr. Ittner: In what part of Germany are these kilns used?



A. V. BLEININGER, Columbus, Ohio.

Mr. Bleininger: They are used in the Provinces of Silesia and Thuringia.

Mr. Hervey Haigh, Catskill, N. Y.: My experience with continuous kilns is that with a top fire you will not get the results we must have on our American face brick, but there are kilns to my knowledge in which face brick are burned, as our friend stated just now, successfully in continuous kilns. I should like to hear from Mr. Lovejoy on this question, as I understand he has had continuous kilns burning face brick for fourteen years.

Mr. Lovejoy: I am hardly in a position to answer this question. I do not know of a continuous kiln that would be successful in burning all sorts of material. Our experience with the continuous kilns in the beginning was decidedly sad, and the results of our years of work have not been to make the kilns applicable to the material, but to find material adapted to the kilns, and in that way we have kept the kiln running all these years. I do not believe that the continuous kiln has proven successful on face brick, and unless it is very considerably modified from present forms I do not think it will be successful.

The President: We will now take up Question 7.

#### "WILL ANY SALMON BRICK WITHSTAND EXPOSURE TO FREEZING?"

Mr. D. V. Purington, Chicago: As Questions 7 and 8 are so closely related, I suggest that they be considered together.

The President: If there is no objection that will be done.

Mr. A. Ittner, St. Louis: I do not think with Mr. Purington



that these questions have any relevancy to each other, and I would suggest that they be considered separately.

The President: Then we will consider them separately.

Mr. Ittner: In answer to the question, I will say—Yes, they will stand exposure to freezing weather, but with very disastrous results to the brick. [Laughter.] Any salmon brick made from any clay of which I have knowledge would not need frost to destroy them. They would be destroyed when subjected to dampness or rain, without frost.

The Secretary: Mr. Ittner makes dry press brick, but there is a gentleman present from New York who makes soft mud paving brick.

Mr. Ittner: I desire to correct our Secretary. While I am making dry clay brick now, I have made tempered clay brick the larger portion of my lifetime, and when I speak of salmon clay brick I do not make any distinction; but now I wish to say that I believe a tempered clay salmon brick would last considerably longer than a dry clay salmon brick, but it would be only a question of time when they would go to pieces, each in its turn.

Mr. D. V. Purington, Chicago: In using the term "salmon brick," where do you draw the dividing line between a salmon brick and a hard-burned clay brick? The point I make is—and I want you to explain it—when you say that a salmon brick won't stand freezing, how high up the scale do you go before they cease to be salmon brick, and how can you tell it?

Mr. Ittner: Mr. President, that is a hard matter to tell. I cannot tell, of course, what degree of heat each brick receives during the process of burning, but it is an easy matter in our clay to tell not only a salmon from a harder burned brick, but also from what we call a light red brick or medium red brick, from a dark red brick or hard dark red brick. We have these distinctions, and it depends on the degree of heat that the bricks receive during the process of burning that places them in either of these categories. The salmon brick with us—there are different qualities of salmon brick; some are better than others—but those that have received the least amount of heat have a very yellow appearance. The salmon brick which has received a little greater degree of heat approaches more the red color of the brick when it is harder burned. I cannot just give the distinction between a salmon brick and another brick, as far as the degree of heat they have received is concerned, but a salmon brick is so apparent to us that anyone can tell it when they see it and have an opportunity to examine it. A man with slight experience, when the difference is once explained to him, can tell it as well as a person in the business all his life. I do not know whether I have answered the question satisfactorily.

Mr. D. V. Purington: My understanding of it is that they are green brick. A hard-burned brick has regular gradations. There must come a point where a sound brick comes in. What is that point? Do you judge a salmon brick by its appearance or sound?

Mr. Ittner: By its appearance. In our clay it is not necessary to go to the matter of sound; you can tell a salmon brick by its appearance. Where we get salmon brick, we get them out of our open-top up-draft kilns, where we set forty-two high. In some kilns we get two courses of salmon brick on top; in some kilns three courses; some four, and we have burned kilns where the burning was not a success, where we got six or seven courses. Under the salmon brick we have a number of courses of light red brick, then medium brick, then dark red, and then hard dark red brick, and below that, in the benches, we get the hard brick for sewers or heavy buildings, where great strength in the brick is required.

Mr. J. F. Smith, Omaha: We have a clay that burns red. In Chicago it does not burn red. I would suggest to Mr. Purington that the way I would grade his brick as salmon brick would be to take a brick that would stand the weather on the outside. Any brick hard enough to stand the weather I would call red brick, and above that salmon brick—something that will not stand the weather.

Mr. J. E. Clapp, Vicksburg, Mich.: When we talk of salmon brick we must take into consideration something more than color. With our clay, any brick burned enough to show color will stand the weather in any place except close to the ground or in the ground, while in a neighboring yard, a brick burned to bright red, the brick will not stand the weather in the ground or in a wall near the ground. I think the character of the clay has considerable to do with the question. We call a brick salmon brick when, if placed in water and allowed to stand, will soak up the water. If it will not soak up any water, it will stand, with our clay, in any wall.

Mr. Ittner: It did not occur to me before, but the character of clay that Mr. Purington is working in Chicago is an unusual kind of clay. When I was there once I thought all the brick were salmon, and I picked up some and clapped them together, and knew they were well made. It is so in Milwaukee. I could not in that case tell the difference between a salmon and light red brick unless I sounded them.

Mr. Purington: I did not ask this question in relation to Chicago brick, because there is no brick burned in the United States where the distinction is so clearly defined as in Chicago. When our brick are white or gray they will stand the weather; any brick that is red is a salmon brick.

Mr. O. N. Townsend, Zanesville: Our experience is that a common brick that will absorb 20 per cent. of moisture is a salmon brick.

Mr. Alfred Yates, Boston: As I understand it, a salmon brick is a soft brick. As the members of the craft well know, there are two bonds in clay. One is a plastic bond, and the other is a metallic bond. This soft brick, having only the plastic bond, will absorb moisture, and the expansion of the ice will disintegrate it.

Mr. T. B. McAvoy, Philadelphia: We make brick from clay that burns red. We call everything salmon brick that is in any way soft. There is a tingle when you tap two bricks together that any brickmaker, with his eyes closed, who is sufficiently experienced, can tell when he reaches a salmon brick. There is a tingle in the brick that quits when you reach the soft brick.

Mr. Charles W. Hoff, Terre Haute: I have salmon brick which will ring like a bell.

The President: We will proceed to Question 8.

#### "HOW MUCH WATER CAN A BRICK ABSORB AND YET BE SAFE FROM FROST DISINTEGRATION?"

Mr. G. M. Fiske, Boston: Looking over the list a few days before coming to the Convention, and noticing that question, it occurred to me that last year Prof. Orton read a very interesting paper directly on that subject before the Ohio Clayworkers' Association, and I turned back to that, for it struck me at the time as a valuable paper in reading it over, and I found a good deal of information there, as there always is in his papers. I made a copy of a few paragraphs from it. If Prof. Orton will speak upon that subject himself, I would rather have him do so than read the extract myself.

Mr. Fiske read the following:

"These considerations make it very much more plain why a rather light-red soft mud brick can often stand 12 or 13 per cent. of water and be frozen and thawed all winter without result, while a shale building brick, obviously much harder burnt and stronger when tested by rattler or cross-breaking, will go down ignominiously with the first hard freeze. Also, why a dry press brick, burnt in a kiln of stiff mud pavers, so that every grain is clear beyond the point of dangerous absorption of water, will still fail if tested by frost. \* \* \*

"It is therefore obvious that one cannot lay down arbitrary rules on this subject. We have seen that clays vary greatly in their frost-resisting power at the same heats, or rather that very different heats are required to bring different clays to the point of immunity from frost, and also that the same clay will be very materially affected in its frost-resisting power by the method used in making it into merchantable wares." \* \* \*

"In our present state of knowledge, we certainly know that water absorption is not a guide to the probable strength of the brick, unless considered in the light of a full knowledge of the



clay used and the process by which the brick was made. For instance, if we know that a soft mud brick from alluvial clays absorbs 10 per cent. of water, it would be comparatively safe to assume it safe from frost. But if it were a stiff mud brick of the same clay, it would be hardly safe to allow it over one-half of this per cent. of water-absorption.

"If dry pressed from the same clay, 2 per cent. of water would be as much as I should be willing to see it absorb." \* \* \*

This whole article, which is very interesting, indicates that there are so many different conditions entering into the clay and the different methods of manufacture, that it is impossible to set down any rule as to how much water a brick may absorb and yet be safe from frost disintegration.

Mr. A. Ittner, St. Louis: I would like to say this, before Prof. Orton speaks, so that perhaps he can dwell on this idea, too. It is not over two weeks since I met Mr. Colby, one of our Commissioners of Public Works in St. Louis, and his special branch is that of sewer commissioner. I said to him, "Mr. Colby, if I had anything to do with street-paving brick, in its use or in its manufacture, I would wholly discard the absorption test," and immediately his answer came, "Mr. Ittner, we have discarded the absorption test altogether." Now, then, what I want to say further is this—that a brick made by our process—as I see the Professor in his paper dwelt on the dry clay process—a brick made by our process and thoroughly burned will stand any amount of absorption and freezing without injury. In fact, I have taken a well-burned red-hot brick out of our kilns in winter time and thrown it into a bucket of water, and it was not injured.

Mr. J. E. Clapp, Vicksburg, Mich.: I was unloading some brick this fall, and a mason came and asked me how much water one of the bricks would take up. I had not tested it. He took it into a saloon, and after a while came out and said that the brick had taken up over a quart of water. We placed it outside for a few minutes, and then took it in again, and it took up a pint more. We had samples of brick from another yard twenty miles northwest from us, and also samples of brick from a yard eighteen miles south of us. I found by actual test that our brick and the one from the northwest would take up nearly a pint of water by measure. The brick from the yard south of us took up a little more water. The bricks from that yard stand the weather, because bricks from that yard have been in buildings which have stood for twenty-five years.

Prof. Edward Orton, Jr., Columbus, O.: I do not think I can throw any light on the situation more than was given in the paper a year ago at the Ohio Clayworkers' meeting. You can probably get a copy of it by looking over the trade journals of that time. That paper was devoted to showing the great variations in conditions which will affect the subject under consideration. We have one new point since I wrote that paper. I got it from Prof. Wheeler, of the Missouri Geological Survey. He called on me a few nights since on his way to St. Louis, and asked me to tender his apologies to the Convention for not being here; that he had planned his trip with special reference to winding up at this point, but had been compelled to go home in advance of the time set for the Convention. He said that in his experience it made a difference how the brick was situated, as to whether it would stand freezing. A brick which would stand a large percentage of water perfectly well when laid on the ground and frozen could not stand it if set on a block and frozen. He said that the reason is, if it is set upon a block the frost will strike it practically from all sides at once. It forms a film of ice surrounding the entire surface, and as it thickens and strikes into the body it forms an impregnable layer through which the interior water must expand. Consequently, a brick will almost invariably burst if it is supported in that way in freezing weather, but laid on the ground it will freeze from the top downward, the ground protecting the bottom side from freezing, and the water crowding through the bottom pores. He said he had repeatedly noticed relatively soft bricks in pavements, with a half-inch of ice on them, after a severe and constant freezing which followed rain. The freez-

ing proceeded from one side of the brick at a time and the other side was not frozen, and that had allowed the water to work its way upward, because the porous structure of the brick was not blocked on all sides at once. Bricks which would ordinarily be perfectly safe in the wall, or on the street, or lying loose on the ground, would not be safe under the conditions of exposure which he described. It is impossible to set a limit at which freezing will burst a brick. You cannot set any such limit. It depends on the structure of the clay and on how the brick is made; but it is not uncommon to find cases where a piece of clay will absorb 20 per cent. of water and stand freezing afterwards.

Mr. Eudaly: I have heard this question of setting bricks on boards and on the ground discussed a number of times. Four years ago I bought a lot of drain tile which were not all used. They were put in piles on the farm. They were made from different clays, from different localities, and of these tiles, which seemed to be open and porous, neither those on the ground nor those on the top of the pile were cracked or broken by the frost, although they have been full of frost time and



D. V. PURINGTON, Chicago, Ills.

again. Tiles made from another bed of clay by the same process and piled in the same way cracked and broke badly where they lay on the ground; while those lying on the top of the pile remained sound, so that my experience in this instance seems to contradict the theories just advanced. The tile which was sleek and glossy and seemed just the thing for freezing weather, would not stand water and freezing, but went to pieces.

The President: The next subject is Question 9.

"DOES NOT SALTPETERING INJURE SALMON BRICK AS MUCH AS FROST?"

Mr. D. V. Purington, Chicago: Mr. Chairman, I suggest that Question 9 be passed, for the reason that this Association cannot afford to throw its protecting arm around salmon brick. What we want to do is to get rid of them.

The President: Unless objection is made, we will pass Question 9.

Mr. Ittner: Hold on! Chicago is not running this Conven-



tion. I will ask the Secretary to read the question.

The Secretary re-read the question.

Mr. Ittner: My point is that it does not make any difference whether it injures it or not. I think the question should be discussed. I have some charity for the members of the Association, and always desire to hear a full expression from our members on every question brought up. It has always been a source of regret to me that more of our members were not heard from during our sessions. We would get more information, perhaps, if some who do not speak at all would speak once, and a great many who speak often would speak less. That has always been my desire. We must regard the interests of all our members, and we must deal with these propositions that come before us here in good faith and with all sincerity. Now, the point I want to make is this—that if there be a member of this Association who pays his annual dues, and who feels that he has not that element in his make-up that will allow him to stand on the floor of this Convention and address the Chair, and say his say, and if he wants to get out any information through the medium of our question-box, I say he ought to be heard or we should give him the information. I did not rise to say anything on this question, and do not care now to say anything, except to combat the position taken by my friend Purington. I said in a jocular way that Chicago is not running this Convention. Of course, I did not mean anything serious—it was a little pleasantry. I do, however, want that question to be dealt with, and if there is anyone here who has anything to say on the question, I want him to say it; and if no one else has anything to say, I will say something later.

Mr. E. M. Pike, Chenoa, Ill.: I am one of those who have not yet said a word. I have had a little experience with saltpeter brick. Mr. Purington is pretty near right. I had an experience that cost me two hundred dollars in this saltpeter brick business. The brick were not burned in my yard, and it is not necessary to mention where they were burned. I put them in a wall, and they broke off, split off and disintegrated. I thought the entire wall was coming down. I had a mason take some of them out and replace them with good brick. I have done that on and off for three years, and believe they are still disintegrating. A soft brick is worth something, but a saltpetered brick is not good in the ground or air, or in a wall, and is not good under cover. Put it in a trunk, lock the trunk, and the brick will disintegrate. A sun-dried brick is worth something—a saltpeter brick is worth nothing.

Mr. Ittner: I will ask Mr. Pike a question, if it is admissible. I think he is talking about face brick. Are they face brick which you put on the outside face of the wall?

Mr. Pike: It is on an alley wall. [Laughter.] They are outside common brick, and very hard.

Mr. Ittner: Well, I haven't anything to say.

Mr. Pike: That is the outside condition of the wall. What is the internal condition of the wall deponent saith not.

Mr. Charles W. Hoff, Terre Haute: I saw some brick that had been in the foundation in the ground cellar, sixteen feet deep, for twenty years. The brick were dug up, and they were harder than the day they were put in. It was a sandy soil.

Mr. Ittner: I want to say a word in answer to Mr. Pike. His remarks make it necessary that I should say something. I intimated a while ago, when we were on the subject of the effect of frost on salmon brick, that it was not necessary for frost to come in contact with salmon brick to injure them; that they would be injured by dampness or in a wet place, without frost coming in contact with them. I do not think that anyone claiming to be a brickmaker would put a salmon brick on the outside of a wall. I take direct issue with him, and it is the first time, I believe, in my connection with this Association, that I have taken issue with one whom I deem to be a practical man—one knowing more than I do. Mr. Pike made the assertion that salmon brick would go to pieces in a trunk, locked up, or anywhere. I want to make a declaration here as a brickmaker. Saltpeter is one of the essential components of the salmon brick.

It has not reached that degree of heat, during the process of burning, which drives that element out of it, to a great extent, and therefore it displays more of that than would a harder burned brick, but I defy any man to say that they will be evidenced on the outside, unless it comes in contact with dampness. Dampness affects a brick in this respect, as does a match or fuse powder to affect an explosion; without the dampness, saltpeter would not appear. As without contact with fire or an electric spark fire would not explode. Unless it becomes white-washed in burning and gets some efflorescence on the outside during the process of burning, and unless you bring them in contact with dampness, you cannot tell anything about the saltpeter. As a man who has been in the brick manufacturing business all his life, I say that a salmon brick will stand a thousand years if you keep it away from dampness, and it will stand in any dwelling-house three or four stories high. It will stand as long as any other brick, however hard burned, if you keep free from dampness. It will stand for all time. Only a few days ago a building was demolished in St. Louis which has stood for seventy years, and the salmon brick were as good as the day they were laid. Of course they were protected from the weather and dampness by the harder burned face brick.

Mr. D. V. Purington: St. Louis seems to be running this Convention. [Laughter.] I want to call attention to the discussion of this question, and to ask the Chairman to hold the debaters down to the question they are discussing. We have heard from Mr. Pike and Mr. Ittner, and neither one has touched upon the question as framed. I want to say, in direct contradiction of what Mr. Ittner says, that if he will go to Galesburg, Ill., I will show him brick on the inside of a building, perfectly dry, that have absolutely gone to pieces. No dampness has ever gotten to them. They were good salmon brick when put into the wall. You can now take your knife and whittle them to pieces. It is because of the alkali. It is not all brick burned as they are that contain the same amount of saltpeter or alkali. I was led to infer from Mr. Ittner's remarks that the saltpeter existed in all salmon brick to an equal extent, and that because they were salmon brick the saltpeter existed there.

Mr. Charles H. Merrick, Syracuse: I noticed, as a builder, this white surface coming out on the brick in the fall of the year. The face brick are soaked in water and laid in lime water. The lime water soaks into the brick, and the lime comes out on the surface. Much of the efflorescence is lime, not affecting the brick one iota.

Mr. Pike: I think we should come to a conclusion in this matter—that saltpeter is good to save hands, but not to save brick. [Laughter.]

Mr. Eudaly: I think we are all sorry that we ever gave soft brick such prominence in our proceedings.

The President: We will now consider Question 10.

**"HAVE NOT BRICKMAKERS MADE A MISTAKE AND SACRIFICED THE ARTISTIC EFFECT BY TOO CLOSE SHADING FOR COLOR IN TRYING TO PRODUCE A MONOTONE FRONT?"**

Mr. Ittner: It is a matter of taste. If you can educate architects to believe that it is not necessary to sort your brick for color, you have gained an element of cost in producing them, because I regard that it costs me from one dollar to one dollar and a quarter per thousand to sort brick and ship them of an even shade. It is a matter of taste entirely. Some people want a wall to be variegated, and others want it uniform in color. If it is to be uniform, the brick must be shaded.

Mr. G. M. Fiske, Boston: This is a matter of taste, as has been said. It is an important matter to bring the element of taste into brickmaking. If we look back to thirty years ago we will find that this thing was not thought of. Bricks were culled, but we had to deal with red bricks entirely, and very few blended bricks were made. Now brickmaking and the use of brick is a different thing. Under the elements that come in we find not only improved methods of manufacture, but new



products. Architectural terra cotta has come in during the last thirty years, a new element, calling for artistic skill in its production, and the question of color, which is another thing. This applies more particularly to what we call fancy-colored brick, and perhaps to what we call fire-flashed brick, for that is where the most beautiful colors come in. Our architects are giving this matter a good deal of study, and at first, when these bricks came in, they wanted even coloring; but now it is generally considered that some little shading is more beautiful. You remember when we took the ride in Buffalo, a year ago, we came to fine residences built of mottled brick, another of gray brick, another of yellow brick with white trimmings, and another of golden-colored brick, and we saw that the question of color decidedly came in, and we are not only producing a brick, something which is indestructible and fire-proof, but we are producing an artistic effect with our brick. It is a new element in the manufacture of brick which has come up within a few years. It is one worthy of consideration. Consider how the fire-flashed bricks are burned! The indestructible colors in this brick have been produced by a Master Hand, and when they are in a wall they produce an effect which is in itself a color effect of the highest artistic grade. [Applause.]

Mr. James Taylor: I think that the manufacturers of front and pressed brick have most certainly made a costly mistake in the matter of too close shading in color, because, in so doing they have departed from the fundamental principles of art. The desire for uniformity arises from a narrow idea in the finite mind. Diversity is the grand unity of the Almighty Creator, who in no case repeats His work. Looking over the surface of old ocean, whence comes the various visions which at all times charm everyone who may sit or stand and look at the ever advancing and receding waves, with their rippling surface or foaming crests? Turn to the waving forest, with its broad expanse of shimmering leaves. Are any two exactly alike in form or in color? Do they not present a constantly changing shade of color, painted by the sunlight, or shaded by the depth of the shadows, while they maintain a true unity in tone of color? Coming from nature, the greatest of all instructors, to the material we are considering, viz., front brick, ought we not to seek to produce the same effect which we know is beautiful and therefore must be correct? Why are the onyx and marble considered so fair? Why are so many natural wood surfaces used in our best architectural efforts? Simply because of the varied shades in the general tone of color. Then why should not the same principle govern our taste in the surfaces of our brick work? To illustrate my point, I will relate an experience of my own. About ten years ago I supplied the brick for the walls of a building on the north side of Grace Church, New York. The owner gave me much concern by his fault-finding, because, as he said, the bricks were not as he wanted—of one shade. Soon after the wall was finished Denman Thompson produced his popular play entitled "The Old Homestead." One of the scenes was a view of Broadway and Grace Church, and of this very brick wall I had been so troubled about. When I saw it I was impressed with the work of the artist, and learned a lesson I shall never forget, although I may not succeed in convincing everybody of its truth. The artist, for the purpose of making a good picture, had accented the variety of shade in the brick work. Then finally, look at the walls of this Convention hall. They are of one uniform color, but by the various-sized circles scratched upon the surface while the mortar was soft we have a multitude of shades, which give life and form to the otherwise dead flat surface. I have been told that this artistic error on the part of the brickmaker or owner or architect adds from one to one and a half dollars per thousand to the cost of brickmaking by the necessity of selection, and compels the making of many more brick than are required to fill an order. Let us try to save this expense and avoid this loss by earnestly seeking to lead our customers to a true idea of what is good and beautiful. We have had to pay dearly for attempting to do

what a paint brush can do much better and more cheaply. [Applause.]

On motion, adjourned.

### THIRD SESSION.

Pittsburg, February 16th.

President Flinn called the meeting to order at 2:55 and announced the first business to be the reading of the paper on "The Economy of Brick as Compared with Frame Structures," by Mr. R. N. Buell, of New Britain, Conn.

The Secretary: Mr. Buell is unable to be with us, but has sent his paper, with a letter, both of which I will read.

T. A. Randall, Secretary N. B. M. A.:

Dear Sir—"Man proposes and God disposes." It is with sincere regret and heartfelt disappointment that I inform you that I am unable to be with you at Pittsburg. I had made all arrangements to start to-morrow, but unforeseen circumstances, which cannot well be put aside, have prevented my leaving home. However, I have forwarded to you my "feeble effort," which, I trust, will meet with the approval of the Convention.



R. N. BUELL, New Britain, Conn.

Trusting that the annual meeting will prove of lasting benefit to clayworkers, I am,

Sincerely yours,  
New Britain, Conn., February 12, 1898. R. N. BUELL.

### THE ECONOMY OF BRICK STRUCTURES AS COMPARED WITH THOSE OF WOOD.

Mr. President and Members of the National Brickmakers' Association—Gentlemen:

In preparing the following paper, the writer has not been unmindful of the difficulties which beset an impartial and helpful treatment of the subject. The desire has been to be plain, brief and practical rather than technical, with the hope that thereby a larger number of the members of this Association will be disposed to discuss and carefully consider the problem which confronts us.

The matter herein presented, meagre as it may appear, is the result of much painstaking effort, and previous to its creation over a hundred architects, builders and brickmakers in all parts of the country were interviewed in an effort to obtain the opinions of those most interested.

In treating this subject I will divide it into two distinct parts. First, the comparative cost of wood and brick structures, and, second, how best to demonstrate the facts to American home-builders.

Brick-building, as well as brickmaking, has, within the last decade, undergone radical changes, and when I speak of brick houses in comparison with those of wood, I do not mean those square brick boxes, relics of a bygone age, with a few small loopholes, misnamed doors and windows, no angles but right angles, no arches, panels, belts or other ornamentation. It is not to be wondered at that such structures were considered monotonous. Built with solid walls of brick



which would absorb their own weight of water, is it any wonder they were damp?

On the contrary, when the brick house is mentioned herein, I mean the modern brick house, with liberal but not necessarily expensive ornamentation, whose walls contain an air-space (either by the use of hollow brick or otherwise) and provided with a damp course of asphalt or other moisture-proof material, at the ground level.

And, again, when I mention a wooden house, I do not mean the cheapest kind, but a first-class one, with good studding, sheathing outside and in, and good finish throughout.

Some inspired individual has proclaimed that "Comparisons are odious," but be that as it may, I feel constrained to stick to my text and furnish two or three examples which will serve to illustrate the point at issue.

In the suburbs of the city of Hartford, Conn., during the last year, a gentleman proposed to erect a number of double houses to rent. Being unhampered by fire-limits, his arch teets advised the erection of wooden buildings in preference to brick, but this client, not so easily influenced, insisted on plans being prepared for both brick and wood structures, the finish to be as far as possible identical.

When the plans were submitted to the contractors the following estimates were furnished by the lowest responsible bidder:

Price for wooden house, \$4,300. Price for brick house, \$4,720.

Then the owner, being somewhat of a mathematician, added these figures:

|                                                          |         |         |
|----------------------------------------------------------|---------|---------|
| First cost of wooden house.....                          | \$4,300 |         |
| Estimated cost of repairs for 8 years (2 paintings)..... | 450     |         |
| Extra insurance 8 years .....                            | 42      |         |
| Extra rent for brick house 8 years.....                  | 96      |         |
| Total cost of wooden house 8 years.....                  |         | \$4,888 |
| First cost brick house.....                              | \$4,720 |         |
| Estimated repairs, painting, etc., 8 years.....          | 125     |         |
| Total cost of brick house 8 years.....                   |         | \$4,845 |
| Difference in cost in favor of brick.....                | \$ 43   |         |

It is, perhaps, unnecessary to add that the brick houses were erected.

Not to deal too much with any particular locality, my next example will be from Buffalo, N. Y. A brick residence was recently erected in that city, at a cost of \$16,000, for which tenders were submitted for both brick and wood structures; the lowest bid for the wooden house was a trifle over \$15,000. Hardly a thousand dollars difference, which was more than made up in five years by saving in heat, insurance and repairs.

Again, in Wilkesbarre, Pa., two dwelling houses, two stories high, 21 ft. by 41 ft., were erected from the same plan, one of brick, the other of wood, and pretty little structures they were, too, with plenty of appropriate ornamentation. The first cost of the brick house was \$2,300, the wooden house, \$2,150.

I might quote several more cases of this sort which have come under my observation, but those given will, I think, suffice.

In studying the question many builders and others have attempted to discover some item of expense in a brick house which might be curtailed. Such efforts, however, where ordinary competition is allowed in bidding for the work, generally proves a detriment to the building, either in appearance or actual stability.

Let us pause a moment and investigate a trifle. As labor is generally the largest item in all building operations, we will consider that first.

In discussing this same question a year ago at Buffalo, some of the distinguished members of this Association gave their opinions on the labor problem; one gentleman, if I quote him correctly, stated: "A worker in wood must necessarily be something of a mechanic, but a man to be a bricklayer only needs two or three dollars' worth of tools and practice in laying brick perfectly square." Now, I am inclined to believe that this view of the matter is hardly fair to the artisan. While we often find bricklayers who lack in both mental and mechanical ability, and while some may be a trifle too fond of the "flowing bowl," I think you will agree with me that the mass of bricklayers are industrious, intelligent and skillful workmen. Although the average wages of the bricklayer the country over is forty-five cents per hour, their pay is none too large when we consider the time which they must lose by wet and cold weather, not to mention time lost in waiting for other artisans.

Alas and alack for the poor bricklayer! Must we use him as a scapegoat for the greedy contractors and others? I frankly believe that 80 per cent. of the brickmasons in this country do not average to earn \$600 per annum. Surely we cannot economize with labor.

As regards economy in the cost of material for the brick house, you brickmakers are best able to judge for yourselves; in some sections I believe you might reduce the price of brick with beneficial results to yourselves, while in many places the price is already too low to produce a good quality of brick. From the standpoint of material, therefore, we can save little, if anything. But let us not be discouraged in our search for economy. I think we can do some missionary work with our architects, who are, as a rule, inclined too much toward expensive ornamentation, such as cut stone, etc., the cost of which is liable to equal that of all other mason work. Not that I would have him leave out the ornamentation entirely, but I would have it limited to such embellishment as can be executed in a brick at a small extra expense.

There is a custom among builders, which, for economy's sake at least, should be corrected, namely, the letting of contracts for brick buildings to carpenters. Whether it is a lack of push or energy on the part of the mason or a lack of capital I am not prepared to say, but the fact remains that this practice among builders is not what it should be, and we cannot expect to produce a brick structure at a minimum cost until such a time as the contracts for brick houses are let directly to brick builders.

Another source of economy in a brick structure is the saving of heat. By personal experience I have discovered that a brick house once heated can be kept at the proper degree of temperature by the use of 10 per cent less fuel than is required for the same purpose in a wooden house; it matters not what the method may be—stoves, hot air, water or steam. Vice versa, the brick house is cooler in summer for the same reason, the brick walls, properly built, being a non-conductor of heat, cold or moisture.

#### HOW CAN WE BEST DEMONSTRATE THESE FACTS TO AMERICAN HOME-BUILDERS.

I am persuaded that the majority of those present will agree with me in the statements I have just made, but unanimous as we may be in our opinions and conclusive as the evidence in favor of the brick structure may appear to those who have studied the question, the most difficult problem with which we have to contend is how we may bring the facts home to the American people so that they shall see the light as we do.

So rapid has been the advancement in all lines of clay production, particularly that of brick, within the past ten or fifteen years, that thinking members of the craft have asked themselves: Have we outstripped the American people? Yes, the American home-builders.

Do they still live and grope their way in the mysterious halo of the past? Ask an average American citizen why he doesn't live in a brick house and he will probably reply: First, because a brick house is so costly. As we have already knocked this argument in the head, we will proceed. Second, because a brick house is so damp. Now, why does he use this stereotyped expression? Simply because he heard his father or grandfather use it thirty years ago. He does not know that the standard brick of to-day will absorb but a small quantity of moisture; he hasn't heard of the benefit of the asphalt damp course or hollow brick. Third, because a brick house is so plain and monotonous. There it is again. He can't get out of the old rut. It is plainly evident that our citizen is behind the times.

A good physician, after arriving at the proper diagnosis of a case, generally proceeds to prescribe some effectual remedy. I believe we have made the correct diagnosis of the case in hand and the keynote to the remedy I would prescribe may be expressed in one word—Education.

Collectively and individually we must act as teachers, as missionaries, to spread the truth broadcast throughout the land. Collectively, as an Association, we must formulate plans for an educational campaign and individually we must one and all assist to put these plans into execution. One plan, which I believe is feasible, would be to have drawings prepared of two or three different classes of houses, each set to consist of two distinct plans, one for brick structure, the other for wood, the finish to be as far as possible identical. Have several copies prepared and sent to brickmakers in different sections of the country, who would, in turn, have builders prepare estimates. These estimates and other data could then be sent to some person or persons appointed for the purpose who would carefully arrange the statistics, which, together with a few strong arguments in favor of brick structures, could be compiled and printed in a neat pamphlet.

The members of the Association could then be furnished with copies to distribute to contemplating home-builders, with results which I feel sure would more than repay the trifling expense incurred. Some of our clay-machinery men and others would, no doubt, help out by advertising their wares in the pamphlet. Another idea, which a well-known brickmaker has suggested, is best told in his own words: "To demonstrate the economy of brick structures to home-builders, I think it can best be done through the medium of the public prints by well-written articles to appear in the newspapers and periodicals at every favorable opportunity: say, after a fire or some other circumstance in connection with building. I would not have them read like an advertisement, but as though written by some disinterested party. Get the people started to thinking about the matter and they could decide for themselves, often, I think, in favor of brick." This plan is certainly worthy of attention. Whatever may be done in the matter of increasing the consumption of brick as a building material for American homes, it is certain—as death and taxes are certain—that the initial move must be made by the brickmakers themselves, and the place which this Association occupies in the clayworking world to-day puts it in a position, above all others, to inaugurate such an undertaking.

Some one may say that this question will work out its own salvation, namely, as our forests disappear and lumber becomes scarce; its cost will gradually increase until lumber is unable to compete with brick. But in the meantime are we, at the dawn of the twentieth century, to sit in passive mood and patiently wait for the forests to disappear?

I think not. The members of this Association are too progressive, and, if I mistake not, this very Convention, this august assemblage of clayworkers, will have the honor to inaugurate this crusade, which means so much to the craft in general.

An opportunity, gentlemen, yes, even a duty, lies before you; an opportunity to advance your interests as nothing else could do; a duty which you owe to yourselves and your fellow-men who live in darkness and wooden houses. Will you grasp the opportunity—will you perform the duty? In your hands is left the fate of this question, so vital to every member of your craft and so important to the future welfare of your Association. [Applause.]

The Secretary: Just a word before taking up the programme. I wish to suggest that this morning we overlooked a message which came to us from the Mayor of Allegheny City. The letter should have reached us yesterday, but was delayed. We have a courteous letter, addressed to the Secretary of the Association, in which he says:

THE MAYOR OF ALLEGHENY SENDS GREETING.

Allegheny City, Feb. 14, 1898.

Secretary National Brickmakers' Association:

Dear Sir—I regret very much that I will not be able to attend at the opening of your meeting, Tuesday, February 15.

Owing to the disastrous fire at our ice factory, will be obliged to attend a meeting of the directors of the company to-morrow morning and cannot tell when I will get through.

But extend to your Association a hearty welcome to our city, and wish that your deliberations may be profitable to yourselves and all concerned.

Yours truly,

CHARLES GEYER, Mayor.

Mr. Charles H. Merrick, Syracuse, N. Y.: Mr. President, I desire to say a few words on the paper just read. I am a brickmaker and builder, and am brought in contact with architects continually. What I want to say is that we are all brickmakers, and the fact remains that in the majority of the cities throughout this country there are as many, if not more, wooden buildings being put up as brick buildings. I know that the forests are being depleted very fast, and that something must be done, and that we ought, as a brickmakers' convention, begin to work on this line. I have a brother who is an architect, and I am in his office every day, and I see him constantly drawing plans for wooden buildings. I am a mason and builder, and



the other day I met a man who was about to erect a frame building. I said to him, "Why don't you put up a brick building? I will sell the brick cheap, and put in the hollow brick as cheap as the common, for the sake of getting you interested in brick building. You are going to live in a wooden building, when you might have a brick one." I saw that it impressed him that perhaps he could build a brick building as cheap as he could build a wooden one. I believe it is fast coming to the point where we can construct a brick building as cheap as a wooden one, by lining the building with hollow brick, taking less clay and less fuel, and we get a cheap construction, a dry building, a rat-proof building, a building that we can plaster on the wall directly, a warm building, and save in repairs and painting. Here we are, a brickmaking crowd, and, as I observed, we were just about to pass over this paper and not say a word on the question. This is one of the most important questions that we come in contact with. We want to sell our brick. All over the country the brickmakers are poor. Yesterday men said upon this floor that they could not make a dollar in the business. It made me feel bad to hear that. We ought to be able to sell large amounts of brick, and if we go to work in the right way we can induce the architects to specify more brick buildings. Just before I left I said to an architect, "I am going to the brickmakers' convention." He asked for a copy of the report. I was surprised to see he meant what he said. That shows that the architects are beginning to be interested. We must bring this matter to their notice, and I believe, when they see that a brick building can be put up so nearly equal to the price of a wooden building, they will begin to give us a chance to figure. It is a fact, among the builders, when asked how much more a brick building costs than a frame one, that they say from one-third to one-quarter more. Now, through this hollow construction we can get the cost down so that it is not over one-tenth more, when you consider the saving in painting and care which must be given to a frame building. When these things are eliminated, as they largely are in brick buildings, we get the cost down to a point as cheap as that of frame buildings. I hope the brickmakers will go home and talk to their architects. I notice some things, perhaps, that brickmakers do not notice. I seldom see a brickmaker go into an architect's office and talk with them about his goods. When a contract is let they go to the contractor and begin to talk about brick. They should go to the architect and plead with him, argue with him, and let him know that you have goods which he can put in the market for you. When he understands the case he will begin to do something for you. Most of the architects to-day are young men out of colleges, not practical men, and they do not understand these things, and when a practical man goes and tells them that he knows something about brick, and believes a brick building can be constructed as cheaply as a wooden building, almost, the architect begins to listen to them. I was glad when the architect I referred to said, "Bring me a report of your Convention." It made me glad to know that the architects are coming to the front in this matter. If we will give to the architects in our section a copy of the report of this Convention we will sell bricks, I believe, and more brick buildings will be erected. [Applause.]

Mr. James Taylor, Port Monmouth, N. J.: I, for one, am delighted with the remarks of our friend who has just spoken on this paper of Mr. Buell's, for this reason: Yesterday we had a cry of over-production. I suggested to you, gentlemen, that the remedy for over-production was to extend your market. The gentleman who has just taken his seat sounded the key-note. Follow that out, and let everyone become a missionary to push the advantages and the recommendations that can be put before the public for the use of brick, against the use of wood, and then you will never hear another word about over-production, but you will have to run around and get one another to help you out to supply bricks. I am sorry Mr. Buell is not here with us to-day. I think he has clearly furnished to this Association the remedy for over-production and low prices.

Mr. W. D. Gates, Chicago: I certainly expected discussion on this subject. I was thinking, as the paper was being read, whether or not there should be some action taken to keep this in shape—whether there should not be some committee appointed. It is the solution of the over-production problem, and one instance comes to my mind which I want briefly to relate. It is taken from others that have come to me during my experience in the business. There was a court-house to be built, and the statement came to my ears that the stone men had made their brag that they would have the contract, and it was to be a stone court-house, and nothing else. I got interested in the matter and followed it closely. I found that the board of supervisors were to meet to decide what material they would use, and I went out to hunt the thing up. Gentlemen, I went loaded, because, after the boasts of the stone men that were mentioned to me, I expected to have a hard battle. I knew the stone men would take up the argument that they have a material which is practically everlasting. I took with me a series of pictures from the old Egyptian rock ruins, the temples still standing, to show what the condition of the ruins was.



W. A. EUDALY, Cincinnati, Ohio.

I explained the situation that the ruins were standing in a climate where there was no frost and nothing to wear away the stone, as in this climate. I cited the fact that Cleopatra's Needle lasted six thousand years in Egypt, but that when the frosts of New York got hold of it, it crumbled right and left. In Chicago they have started proceedings in which they have gone over stone buildings with a preparation of paraffine—giving them frequent coatings of paraffine. I cited some of the buildings in Chicago, which I called to their attention. I showed them these Egyptian pictures, which showed that stone, even in that mild climate, had perished. I showed them pictures where slabs of stone had fallen off buildings. I showed them one of those pictures in which the stone was in a good state of preservation, but right along where the earth had struck the stone there was a place where the overflow of the Nile in one wet season attacked the alkalis of the earth until it disintegrated the rocks in flakes. I showed these gentlemen a little Roman lamp in my collection, and told them how old it was, and that it had been in the same climate that the Egyptian



ruins were in, and that it was as perfect as the day it was made. I showed them pottery from the Mound Builders. My object was to show them what our material was doing, what it was, and how it would stand fire. I had the satisfaction, when I got through, of having a unanimous vote from these gentlemen to erect a building of brick and terra cotta, with a tile roof. I do not believe one committee can do this, but it should be a committee of the whole, composed of everyone whose business is in that line. We know we have the best building material on earth, and if we should talk it up constantly, as we should do, we would not be able to make enough brick to erect the buildings that the architects would desire to build. [Applause.]

The Secretary: A gentleman requested me to make a statement. He says in figuring on the relative value of wood and brick, based on a number of communications with insurance commissioners, he says he finds that the premium rate is 50 per cent. less on brick than on frame. He says that is a point the members might dwell upon in their educational campaign.

The President: We will now proceed to Question 11.

#### "DOES THE USE OF OIL AS A FUEL INCREASE THE FIRE HAZARD?"

Mr. D. V. Purington, Chicago: This is a question I take a great deal of interest in, and, having burned oil for a number of years, my judgment is that it does not increase the fire hazard. It does not cut any figure, and we get as cheap insurance as the people who burn wood and coal. I never had a fire yet that could be traced to oil. In fact, in one of the most disastrous fires I had, the only thing left was the oil plant. If there is anyone here who differs with me, and thinks the use of oil does increase the fire risk, and he will state his reasons, I may perhaps say something more later.

Mr. James Taylor: I have no opinion to offer. I simply want to state a fact for the benefit of the members in reply to this question. I built and operated for a number of years one of the largest terra cotta works in this country—the Long Island works. We burned coal for the first three years, and we had our insurance from the New York Board of Fire Underwriters. When we undertook to put in oil to burn the kilns, the underwriters were advised what we were going to do, and they were uncertain whether they would allow the same rates to stand. They told us to go ahead and they would form their opinion afterwards; but in their opinion they were doubtful whether it would not increase the risk. We put in the aerated oil fuel system. When they came around, after the plant had been in operation six months, they not only endorsed the use of the oil, but suggested the cancelling of the old insurance policies and gave the company a lower rate from the time the oil was put in. I went around with the examiner and showed him the plant. He could not believe that the kilns were burning. He wanted to see the kilns burning—to see how the oil acted. I said, "There are five kilns burning now." He could not believe it, and I opened the fire-box, and he saw the intense heat.

The President: "Drying Brick in Kiln by Use of Heat from Cooling Kilns," by Mr. S. H. Alsip, Belleville, Ill., is the next paper.

#### DRYING BRICK IN KILNS BY USE OF HEAT FROM COOLING KILNS.

Mr. President and Gentlemen of the Convention:

There is no word which more truly expresses the chief characteristic of the times in general and our times in particular than that word ECONOMY. It is the science of which we have all of late years become ardent students. It is the oracle at whose shrine we have all been forced to kneel.

The topic upon which I have attempted to write, though one of the chief economies in the manufacture of brick, can hardly be called a new one—nevertheless it is not in very general use. This may be due to the fact that brick manufacturers are averse to making any radical changes in their old and established methods of drying. But there are new conditions to contend with and we have been forced to make these changes, often sacrificing the quality to the cheapness of manufacture. Everything has helped us to make a perfect ware, and now lynx-eyed competition has forced the manufacturer to search for methods by which to lessen the cost of production, at the same time maintaining the quality of the ware.

The use of waste heat from a cooling kiln to dry clay wares, though a radical departure from the old way of drying, possesses none

of the disagreeable uncertainties of a scheme. It is a cool, logical and almost simple idea, and what is more to the point, has been thoroughly and practically demonstrated. Now, when you come to think of it, could anything be more plausible than this? You have here a kiln of ware just finished burning and in which there has been consumed tons and tons of expensive fuel. From the crown you see dense wavering volumes of heat ascending, enough, if it could be stored and drawn on as needed, to dry a million of brick. Ought you not, with the proper appliances, be able to reclaim enough to dry a few hundred thousand brick in an adjacent kiln?

This is the subject I have been asked to write upon, and while I feel there are others here eminently more qualified to treat on the subject than I, I will do my best, telling all I know in regard to it, trusting that any mistakes or false impressions I may make will be corrected in the discussion which may follow. As the various phases of the subject cannot be correctly included under one head, I will, for the sake of simplicity, define and discuss them separately as:

First—The utilizing of waste heat from an open-top kiln.

Second—From closed kiln to dryer.

Third—From one closed kiln to another.

As much as I would like, I cannot place before you a method other than theoretical, by which to make use of waste heat from an open-top kiln to dry wares set in a kiln of similar build. There is no question whatever about the feasibility of the plan; the doubt lies in whether it could be economically done. I am inclined to think that it could not. This phase of the subject likely has occupied the minds of many, and may even have been tried. That the attempts were barren of practical results is proven by the fact of its never having been adopted.

As the subject does not include the utilizing of waste heat to be used in dryers, I will merely state that it is an economic device of drying a large daily output, and the use of the waste heat is only another means of heating the air. The most important point is to devise as convenient and simple an arrangement of pipes and tunnels as possible. This is, of course, important in all cases. I should like to speak here of a point that seems to have been overlooked and which may serve as a suggestion to any one contemplating putting in the system. After the wares have come from the dryers they will naturally fall to about the temperature of the surrounding atmosphere. Now, the waste heat from a cooling kiln can still be utilized to raise the temperature in the kiln before putting fire to it, with a saving in fuel equal to that gained by using it for actual water-smoking. In this case, the ware having been previously dried, the temperature can be increased much more rapidly, thus enabling the reclaiming of a much greater volume of the escaping heat. The last phase of the subject has undoubtedly been given the most thought and attention. That is, the drying of wares set in a closed kiln, by use of waste heat from a cooling kiln.

As to the manner in which kilns can be connected with a system of pipes and tunnels, no set of rules can be laid down, as the kind and number of kilns, their location and relation to each other, and the surrounding buildings, govern the manner in which the system can be applied. There are a great many different ways to convey the heat from one kiln to another, and as time will not permit an explanation of each, I will simply classify them as "Overhead and Under-ground Systems."

The clay journals having at different times published with illustrations some of the ways in which drying by waste heat is accomplished, we all know more or less about it, and may even have formed a preference for some particular way. Without attempting to discuss the merits of each, and with no intention to persuade, I will take for an example to explain the construction, a battery of four rectangular kilns, each about fifty feet long, built in a line, side by side, and connected by the overhead system, as follows, which is, in brief, the method carried out as my experience would recommend:

On top of every kiln and on each side, about two feet from face of main side wall, build a horizontal brick flue 24 inches square, running the entire length of kiln. This flue, which will be called the mixing chamber, is connected with the inside of the kiln by nine or ten-inch openings through the crown at intervals of four or five feet. Directly over each hole in crown there is a covered opening in top of mixing chamber in order to permit of manipulating the dampers over the holes in crown. At the ends and in the center of each mixing chamber there are 20-inch openings which have removable covers to them, through which the supply of the necessary amount of air is admitted. Over the top and extending across the entire length of the four kilns, which are connected to the mixing chambers, are two lines of pipe not less than 24 inches in diameter, located about one-fourth the length of kiln from each end. Where the pipes connect with the mixing chambers there are dampers to regulate the draft or to close off a kiln from the circuit entirely. Before proceeding further it may be well to say a few words about the exhaust fan, or blower. This I consider an indispensable adjunct to the system, for the reason that with stacks it is impossible to maintain the draft to any degree of accuracy in the drying from kiln to kiln, owing to the difference of the temperature in the stacks, dampness of tunnels and the variations of the atmosphere, all of which influence the draft more or less, making it next to impossible to arrive at any satisfactory results, while with the fan the draft is always under perfect control and can be increased or decreased at will. The fan is connected with the kilns by underground tunnels in the same manner that the stacks are; that is, in such a way as to create a uniform draft all through the kiln. As to locating the fan we must conform to the existing conditions of the factory and place it wherever convenience will permit. By the use of a pyrometer to show the exact degree of temperature in the top of the kiln, and the pyrometer, which is placed in the tunnel leading from kiln for determining the humidity of the air, failure is rendered almost impossible when utilizing the waste heat from a cooling kiln for water-smoking. When the ware has been previously dried before setting in kiln, this precaution is not so essential; still, by their aid you can proceed more intelligently and obtain more uniform results at all times by the use of them. The gradual rise of temperature is controlled by allowing more or less heat to escape from the cooling kiln and mix with the air that is being drawn in through the openings at each end and in center of mixing chambers. The degree of moisture this air absorbs from the ware is controlled by the rapidity with which it is drawn through the kiln, it being regulated by the speed of the fan.

A bare description of any subject unsupplemented by drawings or sketches is liable to be confusing. In an endeavor to overcome this I will follow the course of the heated air as it escapes from the cooling kiln to the fan, where it is discharged. In the battery of four kilns before mentioned, say, No. 1 is just finished burning and No. 3 is filled and ready to be dried. First, close off kilns 1, 2 and 4 from fan, by means of dampers in the tunnels; at the same time close off kilns 2 and 4 with dampers from the overhead pipes. Next, connect kiln 3 to mixing chambers by removing the plates over the 9 or 10-inch openings in crown. The 20-inch inlets at each end and in center of mixing chambers on kiln 1 for passage of air are left wide open. Now, remove the plates sufficient over the 9 or 10-inch openings in crown of



No. 1, or cooling kiln, sufficient to temper the air to the proper degree. By starting the fan, the air is drawn in through the inlets at both ends and in center of mixing chambers, passing over all the 9 or 10-inch openings, where the heat and air mingle together, and is then carried through the two lines of pipe over into the mixing chambers on kiln 3, where it passes through the 9 or 10-inch openings into top of kiln, then down around the ware and finally into the tunnel leading to fan, where it is discharged. The object of the mixing chamber is to accomplish not only what the word implies, but to make an even distribution of the heated air in the drying kiln. This is very hard to accomplish where the air is admitted in center of crown.

The question uppermost in the minds of those interested, and probably the most important one, is, what are the advantages and savings in utilizing the waste heat from a cooling kiln for water-smoking another?

In order to solve this question, the best way to arrive at the facts is to make a comparison with the method now in general use by drying off with wood. In making a comparison of the two ways, will take a kiln having a capacity of 165,000 brick—requires six days to watersmoke—with labor at \$1.50 per day and wood at \$2.50 per cord. By the method now in general use it will require to watersmoke the kiln, on an average, 15 cords of wood at \$2.50 per cord, which amounts to \$37.50. It is safe in saying that it requires a man on each watch to bring the fuel and attend the fires, making a total of 12 days at \$1.50 per day, or \$18. This item, added to the fuel bill of \$37.50, makes a total expense of \$55.50.

When utilizing the waste heat, all the wood needed is simply enough to start the fires in the furnaces prior to using coal. Assuming this to take three cords of wood at \$2.50 per cord, makes \$7.50. As there is no work to be performed worth mentioning, the regular day engineer can attend the fan and engine during the day, while at night they should have the attention of a man who may take the place of the night watchman, as he has little or nothing to do. But granting that it is necessary to have this man do nothing but watch the fan and engine, allowing \$1.75 per day for his services, in six days would amount to \$10.50, which, added to the fuel bill of \$7.50, makes \$18. In addition to the above expenses when adopting the system of utilizing waste heat, there are a few items of expense not encountered before, such as fuel to generate the steam to run the fan, engine and oil for lubricating. The many conditions will allow only an approximate as to the amount of coal required to generate the steam needed. An exhaust fan of ample capacity to water-smoke the above size kiln in six days will take on an average six-horse power to run it. The estimated cost of fuel to develop six-horse power for six days, with coal at \$2 per ton, is about \$4, to which add 50 cents for oil, makes \$4.50. By adding the \$4.50 to the \$18 makes a total expense of \$22.50. Subtracting this amount from the expense of the method in general use, which is \$55.50, leaves a balance in favor of utilizing the waste heat of \$33, or a saving of 20 cents per thousand.

Taking the above figures as a basis, by adding to or deducting from, as circumstances may dictate, any one can readily figure what the system would accomplish under his own conditions. Without attempting to make an itemized statement, will say that the system as described in this paper would cost about \$1,000. In adopting the system it is important to know which method can be best applied to the style and location of the kilns already built. In determining this the principal points to consider are: Cost of construction, durability, simplicity and, above all, the final results from a financial standpoint. The cost of construction should not be so great as not to permit a fair rate of interest on the capital invested, in addition to deducting from the savings every year a sum equal to the amount of the depreciation in the value of the plant. In other words, it should pay for itself in a certain number of years and still leave a nice balance over all expenses.

The kilns should be connected by the shortest and straightest possible route, and with as few pipes and tunnels as is consistent with obtaining the best results. The operation of the system should be so simple that any one could be made to understand and operate it after an ordinary amount of instruction. The probable life of the construction will, of course, play a very important part in the choice of a system, and also in the advantages to be gained. It should be built as substantial as possible, but not so expensive as to make it a non-paying investment. In arriving at a conclusion the preceding points must all be taken into consideration, for to obtain the best results the system ought to possess all of the above characteristics. [Applause.]

#### THE USE OF WASTE HEAT—GENERAL DISCUSSION.

The President: We will be glad to have this paper discussed.

Mr. T. B. McAvoy, Philadelphia: As I understand the paper, it would apply to dry clay process only.

Mr. S. H. Alsip: No, sir.

Mr. McAvoy: How do you get a soft mud brick to stand up in the kiln so as to enable you to dry them with your system?

Mr. Alsip: There is one place in the paper where I speak of them being previously dried before being put into the kiln.

Mr. McAvoy: That is a matter which ought to be thoroughly explained. It seems to me to be misleading. I cannot see how you would manufacture thirty thousand brick by the soft mud process, and put them into the kiln and apply the drying apparatus that the gentleman explains. I do not see how it is possible. The brick must be dried before you can put them in the kiln, but he has not yet explained how he gets the heat from the kilns to dry the brick before he puts them in.

Mr. D. V. Purington: Is it not true that you watersmoke the bricks in the kiln, not dry them?

Mr. McAvoy: There is a great difference between drying and watersmoking—the latter is part of the burning.

Mr. D. V. Purington: The gentleman said watersmoking.

Mr. McAvoy: That is part of the burning, not part of the drying.

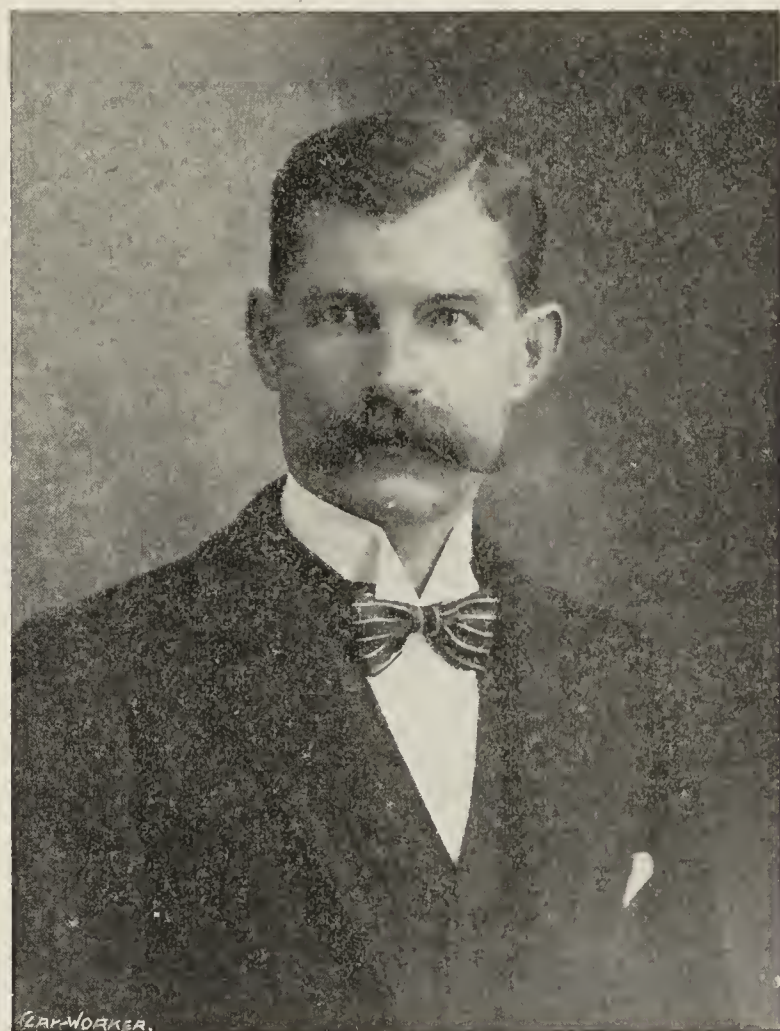
Mr. W. A. Eudaly: He used the term "drying" as we use the term "watersmoking."

Mr. McAvoy: The title of the paper is misleading, because it reads "drying."

Mr. Charles A. Bloomfield, New York: At Portland, Maine, while they do not manufacture brick, but drain pipe, they take the ordinary drain pipe system of thirty kilns surrounding the factory out-doors. They take their drain pipe and put them in the kiln, and the doors are closed up, and heat from the preceding or cooling kiln turned right in, and it dries these pipes, and the heat heats them up and they proceed to fire up. They use the system both for drying and watersmoking.

J. W. Carson, La Prairie, Quebec: Mr. Alsip has had a good deal of experience in the matter and I want to ask him a question. Taking the ordinary down-draft kiln, is it necessary to run the stack higher, to draw the heat out of another kiln, to dry another off, or is it necessary to have a fan?

President Flinn: The Chair desires to say in answer to the question that we have a continuous kiln in operation at our plant here in Pittsburg, where the stack makes all the draft, and it requires no fan, and the brick are put in the kiln from



S. H. ALSIP, Belleville, Ill.

a drying tunnel, reasonably well dried, and all the waste heat utilized. It is very successful. It takes less than half the fuel taken in an open-top kiln. We have had it in operation for years. Any gentleman desiring to see it can do so. Our plant is open for inspection by visiting brickmakers at all times.

Mr. J. W. Carson: As I understand the paper, Mr. Alsip said it was necessary to use a fan. I want to ask if the system can be used without a fan, depending for draft on the stack alone?

President Flinn: My judgment is that Mr. Alsip is right. With a stack the draft is not the same every day; with a fan you can control it.

Mr. Carson: Suppose the stack was of ample capacity; when the day was sluggish, and there was not enough draft, you could use the full capacity of the stack; and when the day was fine and there was plenty of draft, you could choke it off.

The President: You would not have the same control as with a fan.

Mr. D. V. Purington: One experiment I saw was not a suc-



cess—to get the draft you have to take the heat, all of it, just as it comes, into the dryer—perhaps the same would not be true in all cases—but there was too high a degree of heat, and it had to be reduced. When the duct was opened, it was like opening a hole in the stove pipe; that cut off the draft, and we did not get the benefit of it.

Mr. W. A. Endaly: My judgment is that there is quite a wrong impression about the economy that may be obtained by using the waste heat from a cooling kiln, for watersmoking or drying a burning kiln. We set a kiln on fire, and stop firing it, and it is at a white heat and there is an enormous amount of heat; and if we can save that heat we have done a wonderful thing. But we must remember that we cannot turn that heat directly into a green kiln that we propose watersmoking. You can only turn a portion of it in, and you have to mix it with cool air from the upper atmosphere. There are not many places where a green brick will stand the heat direct from a red hot kiln. You cannot save it all in that way, unless you had a great many kilns, that you wished to watersmoke or dry at the same time. I see no reason, however, why the heat cannot be utilized for all it is worth, very much according to the plan suggested in the paper.

Mr. D. V. Purington: Why is it not more used?

Mr. Endaly: People are skeptical about it and do not take hold of it, as they do not use many other improvements. There is no reason, to my mind, why people using down-draft kilns cannot dry their bricks in tunnels, whether soft mud or stiff mud. It can be done and done easily.

Mr. T. B. McAvoy, Philadelphia: We are doing it every day.

Mr. Endaly: There is no reason why it could not be done in a large majority of the brick plants. I can understand where a man has a small brick plant, with one down-draft kiln, possibly two, and has a drier, and fits up the drier to use waste heat to dry his brick; we can understand that there will be times when he will wish to dry brick in that drier and have no heat in the kiln cooling. When there is a large amount, and there is a kiln on hand, there is no trouble; an ordinary size rectangular down-draft kiln will furnish heat enough to a drier to dry one hundred thousand brick a day. There is no doubt about it. The only question which will arise will be the size of the tunnels, under-ground or over-ground, the size of the ducts required to carry the heat from the cooling kiln to the drier; the size of the ducts and the size of the mixing chamber. Many people have tried it, and made the ducts entirely too small and were unable to use the heat. Others have them too large. You must get them of a proper size, and allow the air to pass through at a proper velocity. There is some brick you can dry too fast. They will crack and will not stand it. If you make the ducts that carry the hot air from a cooling kiln to the drier of a proper size, so that you will be able to run the currents of hot air slowly or more rapidly as the brick will stand it, there is no reason why you cannot use the waste heat from a cooling kiln.

There is a mistaken idea about this question, and I believe Mr. Alsip overlooked it in making his comparison of expenses in drying or watersmoking the brick with wood or hot air. I think he has overlooked one important factor. If you use that number of cords of wood for watersmoking or drying a kiln of brick—when you have used that number of cords of wood, and are ready to put on coal or more wood, you have the kiln a great deal hotter than it is possible for you to get it with the heat from a cooling kiln. Therefore, the comparison was hardly fair. In other words, after you have dried a kiln of brick with the hot air from a cooling kiln, it will take more fuel to finish burning it than if you burned the number of cords of wood—unless, perchance, you might have a clay where you could turn the full blast of the hot air right into the kiln; but that kind of clay is very rare.

Mr. Carmichael: In burning our brick we do not use wood. Some years ago we used wood, fifteen to twenty cords to a kiln. We gradually cut down on the quantity of wood, until now we do not use any more than enough to start the fires.

We make paving brick principally, buffs and grays, and it is not a hard matter to spoil bricks of that kind by watersmoking, but we have very good success in watersmoking our brick. We take a piece of sheet iron, and lay it on the grate bars and build a coal fire, West Virginia lump coal, no wood at all. We have a slow heat at the start and the foreman brings on the heat as the bricks will stand it. Our clay is tender, but we handle it satisfactorily. We bring our heat on with the coal altogether, and we consider this method of watersmoking cheaper than wood, at two dollars and a half a cord, which it would cost us. Because our clay is tender, we think it more satisfactory with us than it would be to dry with the hot air, because we would be afraid of the effect of the draft and hot air on our tender clay brick, which are dry pressed. I would be afraid of the draft affecting the brick in the drying, but with the coal we have no such trouble. Our process is cheaper than if we went to the expense of putting in the hot air system and using heat from the cooling kilns.

Mr. McAvoy: There are so many conditions throughout the country that it is a hard matter for any man to speak for the different sections. In the West they make their brick by the dry clay system. What would dry their brick would be of no use to the people in the East. For ten years a question has arisen here as to the use of coal dust in the burning of brick. The Western men maintained that it could not be done; the Eastern men maintained that it could be done. Both parties were right. The trouble was that the Western men tried it with soft coal dust, which will not answer the purpose; the Eastern men accomplished it with hard coal dust, which does answer the purpose. The paper which the gentleman has read refers to the dry clay process. It will not apply to the soft mud process, because he must get his brick dry before he can put them into a kiln to apply the heat. The President of this organization has a continuous kiln. It is the same principle, only on a different plan, that the paper refers to, but he has to dry his brick and get them in condition to put in the kiln before applying the continuous heat.

Mr. S. H. Alsip, Belleville, Ill.: The heading might have been misleading, but the utilization of waste heat after the bricks come from the drier is the question; and there is no reason why the waste heat from another kiln should not be used prior to starting the kiln.

Mr. Endaly: I have an idea, and have tried it in a small way, and find that it works first rate, to utilize the waste heat from a cooling kiln in the burning of a green kiln. My idea and plan is this—to arrange to take the heat from the cooling kiln to the furnace of the burning kiln direct into the ash-pit, and use that hot air from a cooling kiln to produce combustion in the furnace. I am supplying the furnace with hot air, and getting all the heat out of the cooling kiln, and heating air for combustion in the furnace; and in that way I can use the hot air from the other kiln as long as I am firing. It saves a great deal of combustion and heat that would be required in heating the air that is necessary to burn the fuel on the grate bars of the kiln.

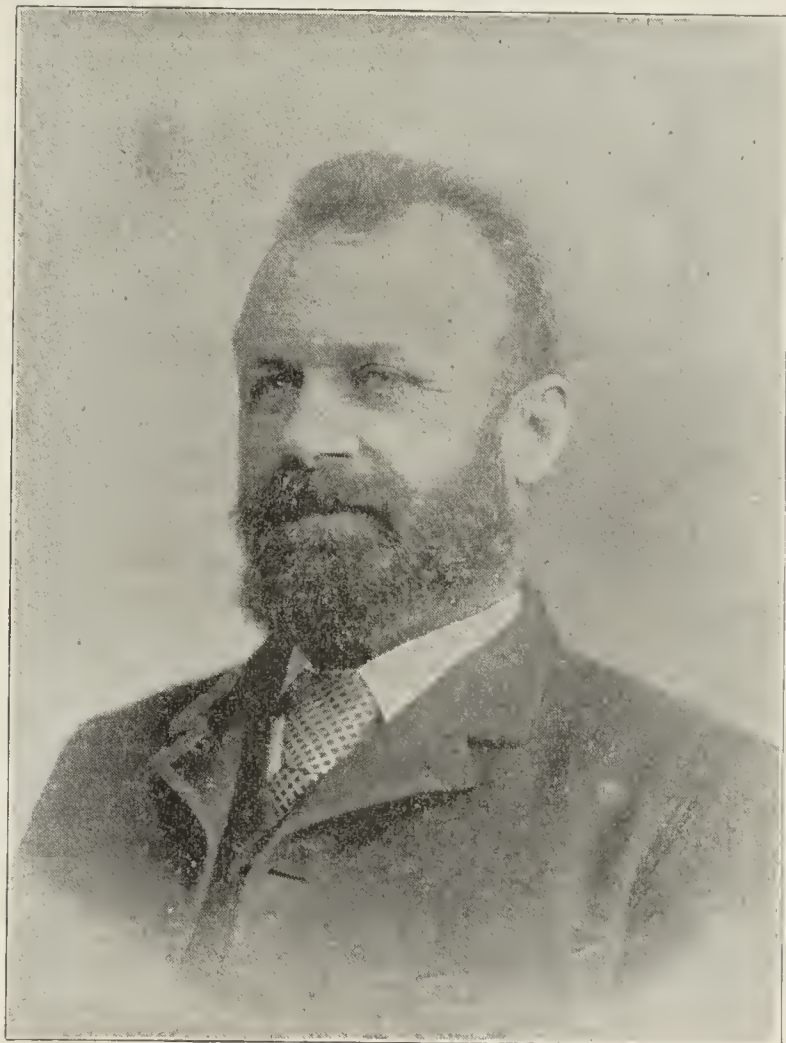
Mr. D. V. Purington: I believe Mr. Ittner, of St. Louis, can give us some points on this subject.

Mr. A. Ittner: Mr. President, I owe Mr. Purington an apology for the words I said this morning, and now receiving a kindness from him, it is too much; and I take back a second time what I said this morning. This subject, of course, should interest the members of this Convention, and it is true, as Mr. Purington has intimated, that I have had some experience with this system; and it may possibly seem strange, when I say to the members of this Convention, as I must—for I want to be honest, and try to be honest under all circumstances—that we are not using it now. But it is not by reason of any defect of the system when properly applied, I take it. Now, if it will not take up too much time of the Convention, which I regard as valuable, I would like to give my experience from the beginning, before I used the fan system, and while I used the principle of drying a kiln of green wares from heat that was



escaping from a kiln of burning brick. When we began this system, I was operating eight kilns abreast, right in a row; and from the top of these kilns—I have explained this at one of our previous Conventions, but that will not debar me from mentioning it again—were three rows of sixteen-inch sheet iron pipes, running from kiln No. 1 to kiln No. 8. Within three or four feet of each end of these pipes, and in the center of the kiln, there were three escaping holes through the arch of the kiln up and connecting with a tube and dampers, that were connected with these sixteen-inch pipes, and we did on one occasion take heat from kiln No. 1 a distance of three hundred and fifty feet to kiln No. 8, and dried kiln No. 8 with the escaping heat from kiln No. 1; but it was such a great distance, and there was so much loss through evaporation of the heat that it did not work well, and we never tried it a second time. After that we never attempted to take the heat further than, say, from kiln No. 1 to kiln No. 4 or No. 5. That was before we got the exhaust fan, and at that time it took twenty and twenty-one, and on one occasion twenty-two days to dry off a kiln of green brick. You can readily imagine why these expensive kilns could not stand that. There was too much money involved in the cost of a patent kiln to allow it to take twenty days to allow it to dry off a kiln of green brick. My stacks were eighty feet high, four-foot chimney for each four kilns. In order to increase the draft, I increased the height of the stacks twenty feet. It increased the draft, but did not give me the draft we desired. I reduced the diameter somewhat, but not sufficient to make it of any great account. After that the thought occurred to me to get an exhaust fan, which I did. I got an exhaust fan, and my kilns have two rows of tunnels running lengthwise of the kiln from one end to the other. The tunnels are two feet square and two stories high. That makes these tunnels two feet square, running lengthwise under the kiln. At one end they are connected with the stack, and at the other end go outside of the kiln wall, and covered up with three-inch thick fire-clay tiling. I have a little tramway running from one end of the kilns to the other, on which I have a steam fan on an iron track, within a few feet of the kiln, just outside of these tunnels, and I have a heavy iron bridge made of sixteen-inch iron, which go right over and take up the two-foot outlet on the tunnel, and put the bridge on that, and have another hole opposite the hole in the fan, thirty inches in diameter, and a connection by which I connect the bridge with the fan and start it going. I found after I dispensed with the stacks and adopted the fan, the exhaust fan, I reduced the time of drying to nine days, and I thought that was quite a gain, still we used the exhaust heat from a cooling kiln, as remarked by Mr. Eudaly, when we had it. Sometimes you do not have it, and then you use wood. Our fan was not of sufficient capacity, something like the stacks, better than the stacks, but not what we wanted. We got a second fan of a greater capacity than the first, by which means we got the drying process down to about six days. One of the men who had my yard in immediate charge seemed to think that the heat did not work just right. It was suggested by one of my sons if we had a little jet of steam to go into the pipe at each connection with the kiln, it would give the heat a dampness or moisture he thought it ought to have. In other words, it was not because we did not have sufficient heat, as brother Eudaly intimated, but it did seem that the heat from a cooling kiln did not have the same effect as the heat made with wood we put in the furnace and dried off with. However, when we got along to this point, I found that these pipes I had from one end of the kiln to the other, which cost thirteen hundred dollars, were being honeycombed with rust, and it would be impossible to patch them, and the only thing left to do would be to renew them. A great many know what kind of business conditions we have had for the last four years, and many, like me, would not have the thirteen hundred dollars to spare, with which to renew those pipes. We did the best we could. We dried off with wood and used the exhaust fan just the same, and we have it so now that it takes us only four days to dry

off our brick. We use about a cord and a half of wood on each side of the kiln. These kilns hold 175,000 brick, and if we do not get up sufficient heat, we use lump coal, and the reason we are enabled to use soft coal, which we could not do unless we had the fan, is on account of the immense draft we can get in our kiln through the aid of the fan. In other words, we could not choke up a kiln if we tried while we have this fan; if we put the fan to its task, and make it do its work. As we dry off, we cool, and only use three cords of wood in drying off a kiln of brick. By this method we dry off brick in four days. We make brick by the dry clay process. We put our brick into the kiln from the machine, and set our bricks thirty-four high; and we now get better results, for some reason or other, in drying brick in four days than we ever got in using the much longer time when we did it under other conditions; and I am disposed to believe that if this system of drying off with escaping heat, as has been explained by the paper which has been read here, could be more perfectly controlled than we have been able to control it, such as I have described—and I am glad to say that I read the same idea in the Clay-Worker, which gave the same idea of having this little jet of steam—if we had



ANTHONY ITTNER, St. Louis, Mo.

this system rebuilt with the little jet of steam, I am disposed to believe if we would adopt this method, with that aid we would be able to dry off a kiln of brick in a shorter time and get the work done as perfectly as we are doing it now, if we had a sufficient amount of heat to last while we are drying them. Sometimes if the clay you are drying off would hang on too long and the heat in the cooling kiln would go down, then the conditions which Mr. Eudaly mentioned might apply; but as long as the heat in the escaping kiln would retain its strength until you are finished with the work of drying off, the kiln being dried off with this escaping heat will have all the heat you want, and I imagine you would be at no disadvantage, as Mr. Eudaly intimated, as compared with drying off with wood or any other fuel. Gentlemen, I think I have explained the thing as well as I know how, and if I have not made myself perfectly plain in any particular, I will be only too glad if any member of this Convention will ask me questions to straighten the matter out.

Mr. E. M. Pike: I can see that the jet of steam applied,



which warms the air, would help the drying off process; but, while that is so, it seems to me that the dampness in the steam would retard the drying, and thereby counteract the effects of the hot air you get.

Mr. Ittner: It is not for the purpose of aiding the heat that we would suggest the application of this steam. My sons suggested, and I agreed with them, that the hot air was too dry and husky; that it did not take hold of the brick and enter the brick as it ought to, and commence from the inside and work outward. Their idea was that this hot air was so dry and husky that it dried the outside shell of the brick, and rather prevented the air from entering the center of the brick, and they said they never got the satisfaction in drying off a kiln of brick with heat from a cooling kiln that they got in drying it off with the heat from burning wood, or a mixture of wood and coal; in other words, that the clay seemed to be in better condition than when it was dried off altogether with hot air.

Mr. J. W. Carson: We tried this same system with iron pipes, something on Mr. Ittner's plan, and every time we tried it on the kilns, and we found that the moisture that was raised by the heat going into the kiln was not carried off, but spread itself and fell down between the back walls of the kiln and dripped on the grate bars. After the bricks were dried out, and we were ready to start with coal or wood, we had to use one or the other to dry out the walls of the furnace or the kiln walls, before we could get any heat in the kiln again, and drove the heat in the walls back into the kiln.

Mr. A. O. Jones, Zanesville, O.: I have had some experience in drying with hot air. I tried an exhaust fan in drying our brick. I dried paving brick with it.

A year ago this past fall I was pushed to fill an order, and we were drying too slow. I got permission from the insurance people to put in an exhaust fan. We carried the waste heat from the top of the kilns down through an underground passage and carried it through the drier and gained three or four days. In building again, I expect to put in a drier with a steam pipe, and shall use the waste air from the cooling kilns in the driers, by the aid of an exhaust fan. I know it will make a great gain. You should be careful, though, in using heat from kilns. If the heat is used carelessly, it is dangerous. I know from experience, for my factory was burned down this winter.

Mr. S. H. Alsip: As to what Mr. Eudaly said a while ago, that fifteen cords of wood would create more heat than utilizing waste heat from cooling kilns. With clay sensitive to checking, where it takes considerable time to watersmoke, you cannot get as much heat out of a cooling kiln as with wood, but where the brick dries fast, you will get more heat out of the cooling kiln than with wood.

Mr. Eudaly: I think that is correct.

Mr. Carl Giessen, Canton: My experience in this line has been varied to some extent. Most of the gentlemen present have seen our system in operation. We utilize the waste heat for drying the brick in the drier. As has been mentioned before, by utilizing the waste heat to dry off in the kiln, it would take a few days more than watersmoking, and the kiln being an expensive structure, we do not think it is profitable to watersmoke or dry brick in the kiln. The fact of the matter is that you can get as high heat in your drier, if you have a fire-proof drier, and manipulate the thing properly, although if you have a drying capacity which is very small you can, by raising the heat, dry your brick in less time and less capacity of drying room and drier, and then you are ready to start without taking out the water, which is taken up by the clay before it is tempered in the pug mill. From the experience we have had in drying, we think it is the cheapest system—we have saved five hundred to six hundred dollars' worth of fuel, and always have dry brick, drier than they have ever been, and it is a great system, and helps the burning of the kilns; and if it is used at the right time it will take a quarter of an inch of settle out of your kiln in the last fire. With a manipulation of the fan

at the proper time, you can take out that settle, and get it on the bottom, without using any coal, and by so doing you do not over-burn the top in trying to force the heat to the bottom. There are many other advantages, besides the advantage of using the heat from the kiln. You have to be careful in many things; also in drying the brick you can get any temperature from ten degrees to six or seven hundred; it depends on the distance of the fan from the kiln. These are points which have to be watched, and especially when you are drawing heat from the kiln. In many places they utilize the heat while the kiln is being burned, utilize the waste heat, and all I have to say is you get enough heat, when the kiln is having a thorough burn, and not having incompetent men to handle the heat while the kiln is being burned. You have to manipulate your fan to such a degree of nicety, to have the heat spread naturally over the kiln, as it would be just taking the natural draft of the chimneys; and I do not think you derive any benefit. Certainly if you have no cooling kiln coming off when you dry brick, you have smoke and gases and discoloration of brick and numerous other things to contend with. Any man who utilizes waste heat for drying alone will save fuel which he can only tell when he puts it in. The brick manufacturers of Canton have varying processes for making brick, and the people who have put in this process of drying make more money than the people who have not, for the difference in coal alone is from five to seven hundred dollars a month. This may seem a big fuel cost, but you could run your factory day or night. It takes forty-eight hours to dry common standard brick, and we dry standard size block of ten pounds in twenty-four hours. Mr. Eudaly and some other gentlemen have given a variety of reasons as to why certain things could be done. There is no more natural system in existence than drying brick by utilizing all waste heat with a fan. On a hot day in summer, if the air does not blow, you do not dry brick; if the air does blow, you dry your brick. That is the philosophy of utilizing waste heat from a cooling kiln with a fan. [Applause.]

Mr. George Albertson, Pittsburg: I ask the gentleman what it costs for fuel, per thousand.

Mr. Giessen: That depends on the amount the manufacturer pays for his burner and his fuel. [Laughter and applause.]

Mr. T. B. McAvoy, Philadelphia: We burn brick under the same system, and it costs two dollars a thousand for burning and drying.

Mr. Giessen: I could say \$1.80 or \$2.25. [Laughter and applause.]

The President: A matter a little out of the regular order will now be brought before the meeting. It is in connection with the place for holding the next Convention.

#### AFTER THE NEXT CONVENTION.

Mr. J. F. Smith, Omaha: Mr. President and Gentlemen: On the 24th and 25th of January last the Nebraska Brick-makers assembled at Omaha, and we had one of the finest meetings the State Association has had, and during that time they elected me President of their Association, and also a delegate to this Convention, with this message—that we ask the National Association to meet in Omaha during the coming year, if it can be arranged. We will have our Trans-Mississippi and International Exposition on from May 1st to November 1st. We would like to have you come there during that time. Gentlemen, that is my mission. I do not want to take up your time, but there are some letters here, which I should like the Secretary to read.

The Secretary read the following communications:

Omaha, Neb., Feb. 10, 1898.

National Association of Brick Manufacturers, Pittsburg, Pa.—Gentlemen:

I take great pleasure, as Mayor of the city of Omaha, in extending to your organization a cordial invitation to hold your annual convention in Omaha this summer or fall during the progress of the Trans-Mississippi Exposition.

Omaha will be the popular convention city of the country this year for many reasons. The Trans-Mississippi and International Exposition holds from June to November, and if you follow the rest of the



people in the world who are traveling, you will certainly be in Omaha, anyway. The Exposition will be the greatest this country has ever seen, excepting only "The World's Fair," and many of our attractions we expect to rival or surpass even that.

Omaha is centrally located, and the exceedingly low railroad rates to the Exposition from all parts of the country will enable many to attend conventions here who could not do so if they were held elsewhere.

Omaha is the most hospitable city on the continent, and I assure you that we will give you a hearty welcome if you hold your convention here. The keys of the city will be at your disposal upon your arrival.

Respectfully,  
FRANK E. MOORES,  
Mayor.

Omaha, Neb., Feb. 12, 1898.

To the National Association of Brick Manufacturers, Pittsburg, Pa.—  
Gentlemen:

The Builders' and Traders' Exchange of this city would, through our worthy vice-president, Mr. J. Fred Smith, most cordially invite your worthy organization to select the city of Omaha, Neb., for the purpose of holding your next annual Convention for the year 1898.

The membership of the Exchange have the honor of claiming all the principal brick manufacturers and brick contractors of Omaha.

Provided you select our city, we will be pleased to grant you all the courtesy in our power. Our rooms will be placed at your service at all times, and any information you may desire will be most cheerfully given.

Hoping your meeting in Pittsburg may be attended with the success which all such Conventions merit, we remain,

Most respectfully,

W. S. WEDGE, Secretary Builders' and Traders' Ex.

Omaha, Neb., Feb. 10, 1898.

National Convention of Brick Manufacturers, in Annual Convention,  
Pittsburg, Pa.:

Greeting—The Trans-Mississippi and International Exposition, designed to illustrate and exhibit the resources, products, capabilities and civilization of the trans-Mississippi states, of the United States and of foreign countries, will be held at Omaha, June 1 to November 1, 1898.

On behalf of the management I desire to extend to your honorable body a most cordial invitation to hold your next meeting at Omaha during the period of the Exposition.

The thirteen railway systems centering at Omaha, with their connecting lines, will make the lowest possible rates to the Exposition, which, possibly, may be of material advantage in securing a large attendance at your annual meeting.

The Exposition management and the citizens of Omaha will exert themselves to make your sojourn in our city entertaining and profitable. We trust that it may be the pleasure of your Association to decide to hold your next meeting in the "Gate City" and during the period of the Exposition.

Yours respectfully,

JOHN A. WAKEFIELD,  
Secretary T. M. and I. Ex.

Omaha, Neb., Feb. 10, 1898.

To the National Association of Brick Manufacturers, Pittsburg, Pa.—  
Greeting:

The Commercial Club of this city by unanimous action cordially invites your worthy organization to select the city of Omaha, Neb., as the place for holding your next annual meeting for the year 1898.

The membership of this club is composed of all the business and professional interests of this city of all classes.

Provided you select Omaha for your next meeting place, we will furnish ample accommodations for meetings, including hall and committee rooms, also guarantee first-class hotel accommodations at reasonable rates. The Trans-Mississippi and International Exposition will be in operation at that time, which will be second only to the World's Fair and will be an attractive feature for your meeting. Omaha is the central city of the United States. Twenty lines of railway diverge from Omaha, forming a direct line of road to every city in the country. This city is midway on the shortest transcontinental line between the two oceans. Provided any of your members desire to go further west, a direct line of road runs from Omaha to all places of interest, including the Black Hills, Yellowstone Park, Colorado, Salt Lake and California. The fact of the Exposition being in Omaha in 1898 will guarantee you less passenger rates than you could otherwise secure.

Again, we urge you to come to Omaha in 1898. The freedom of the city is extended to you and you will be entertained by warm hearts and prodigal hands.

Hoping your meeting in Pittsburg will be attended with success, and extending to you our best wishes, I am,

Yours very truly,

J. E. FTT.

Secretary Omaha Commercial Club.

The President: These communications will lie upon the table until the proper time for them to be acted upon.

Prof. Orton: Is this the time for further offerings of that sort?

The President: Not unless permission is given by the House. There is a matter which the chair does not feel like passing over: 4:30 is announced on the programme as the time for holding an executive session. The question now before the Convention is whether you deem it wise to go into executive session, or continue your present business.

Mr. D. V. Purington: I move that we continue our business session so far as the regular papers are concerned.

Carried.

The President: I would request Vice-President Howard to take the chair and wield the gavel for a time. Before giving way to him I will announce the following as the

#### COMMITTEE ON RESOLUTIONS.

E. S. Ginnell, Galesburg, Ill., chairman; E. Webster, Phil-

adelphia, Pa.; Chas. H. Bray, Helena, Mont.; D. P. Delong, Glens Falls, N. Y.; O. N. Townsend, Zanesville, Ohio; John Miller, Washington, D. C.; J. W. Carson, LaPrairie, Ont.

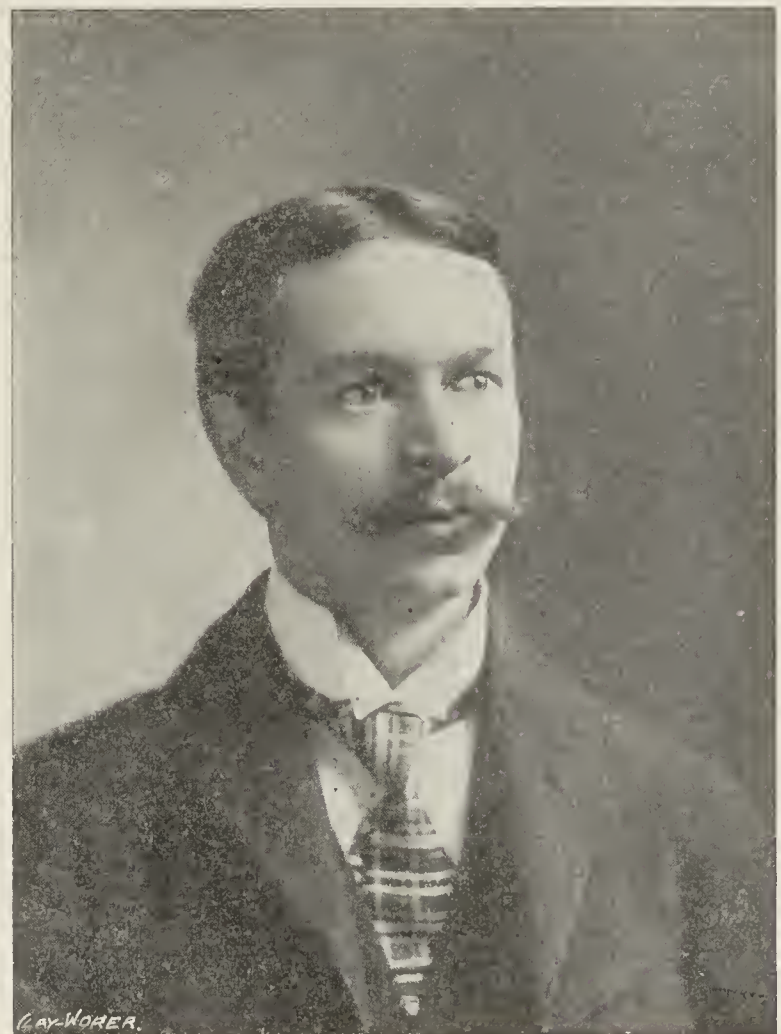
Vice-President Howard: The next paper on the programme, gentlemen, is entitled "Experimental Work, Wise and Otherwise," by E. E. Gorton, Terra Cotta, Ill.

#### EXPERIMENTAL WORK, WISE AND OTHERWISE.

Mr. President and Members of the National Brick Manufacturers' Association:

A demonstration of experimenting, wise and otherwise, could not be more clearly brought before you than the presentation of a paper on this topic by myself. It certainly is an experiment. But though it was my intention to make it a wise one, I am forced to feel that your decision will classify it in the category of the unwise. Nevertheless, I have something which I want to say to the Convention, though I have no doubt that many are present who could say it far better.

The immensity of human knowledge cannot be realized any more than we can realize the unlimited bounds of space. It is impossible for the human mind to conceive the distance of even the nearest fixed star. Neither can we frame any conception of eternity—never-ceasing time without an end. All our ideas are based on finite things. When we speak of time we mean something which we can measure or esti-



E. E. GORTON, Terra Cotta, Ill.

mate, but when we have given our imagination full play and have conceived as long a period as we can, we have not yet begun to fore-shadow the infinite. Human knowledge is not infinite, but when it comes to the question of any of us, even the wisest, realizing the sum total of it, it is infinite so far as our perceptions go. What men know has required centuries of persistent, arduous labor to acquire. This vast store of knowledge has accumulated from the first advent of mortal man on the globe, a period which was formerly regarded of short duration, as extending only a few centuries back; but now the public, as well as the most conservative of geologists, are prone to regard the antiquity of man of no less than thousands of centuries. During this period, month after month, year after year, has witnessed the growth of man's wisdom, and our knowledge still continues to increase with such rapidity as to arouse even the most sanguine mind to wonderment.

Past conditions are very dissimilar to those of to-day. Knowledge began when the first man observed and realized the condition of his surroundings. Observation, or the power to see with the mind as well as with the eye, was the first educator. But, from the beginning man has seen with his eyes while his mind has but slowly realized. In short, he has failed to absorb and comprehend the facts which his eyes had brought into him. Then came experience. In a few words experience may be defined as that which one acquires in the ordinary course of things without aiming at any particular end. It is true that we get experience, and sometimes costly experience, through experimental means. But when we couple together observation and experience and actually set out to achieve certain results, this is no longer observation or experience alone. It deserves a new title—experimenting. When did experimenting begin? One cannot definitely answer that, but certainly a long time after man's existence here. Even the brutes see, observe and experience. Man alone experiments, and he has only learned how as his level above the brute's became more sharply defined. And what has experimenting done for us? To



it more largely than to anything else is credit due for developing the laws and principles on which our modern knowledge is based. Has all this experimental work been wise? Is it fair or generous for us to criticize the horse which has carried us on a long journey and over perilous fords and adventures? It hardly seems so to me. For us in this day to say that the experimenting of the past, done by the millions of inquiring and truth-seeking minds who have passed away, was crude and ignorant and unwise is rank treason and perfidy to their memory. To that which has passed one ought not to say in this connection that anything was foolish, for all has contributed to the fullness of our present knowledge. The early experimenters had no data to guide them upon which to base their calculations, and their only alternative, if they would progress, necessitated a continual reaching-out in the dark—try this and try that, and, perchance, much of their knowledge was gained purely by accident. In fact, the history of inventions and discoveries seems to show that very many are the results of purely accidental events, which the experimenter, while working with other objects in view was keen enough to observe and investigate.

Only three years ago a chemist who had spent many weary hours trying to produce calcium in an electric furnace, becoming discouraged and enraged at his repeated failures, threw the product of one of his operations in a corner with disgust. Striking the wall, it bounded back into a pail of water. He noticed that a gas was being generated, and proceeding to the corner with a lighted candle the gas at once ignited. This proved an incentive for further investigation, which later led to the production and manufacture of acetylene gas, now being so largely used for enriching ordinary illuminating gas and for still more valuable purposes.

The discovery, only lately, of the Roentgen ray was merely the result of an accident, and just so with hundreds of incidents which might be cited.

Less than twenty years ago, the oil drillers who crossed the Pennsylvania line and came over into Ohio with their drills were scoffed at by scientific men, who proclaimed with great confidence that Ohio was a barren field—that it do not contain the rocks in which oil and gas were to be found and that a driller would only have his labor for his pains. But these arguments of the geologists failed to turn the head of the wild-cat driller, and he promiscuously set his drill to work in various locations. Not becoming disheartened with repeated failures he kept to work until the whole northern section of the State had been punctured, even extending over into Indiana and Illinois. What was the result? The largest and most profitable field of oil and gas in the country was discovered. It is true that the Pennsylvania oil rocks do not exist in Ohio. The geologist was right about that, but a new source of oil had been found, of which no previous instance had been recorded, and in which no one could foresee any promise, except he who had faith without knowledge. The geologist followed after the driller, located the anticlines and synclines, and is now able to deduce the laws which govern the location of these deposits and also the conditions most favorable for the deposition of oil and gas. To accomplish this has required the combined work of both the practical and scientific man. The driller could never have deduced from his work alone the immensely valuable laws contributed by the geologist, by which we can may underground deposits with almost the confidence of sight. On the other hand, neither could the geologist have contributed his knowledge unless the wild-cat driller had forced his hand and made himself and his predictions temporarily ridiculous. But with these fixed laws which the geologist has been able to deduce through the work of the driller, it is now possible to predict with much certainty in this field where to set the drill in operation—a fact which is now admitted and used even by the driller himself.

The ceramic industry is interspersed from beginning to end with such examples as the one to which I have just alluded. The results of the countless number of experiments of the practical man has made it possible for the ceramist to follow after and deduce the laws or vital principles upon which the work of the practical man was dependent, but of which he had no knowledge or appreciation. Equipped with a knowledge of these fixed laws and profiting by the experience of past experimenters, although he be ignorant of the practical workings of the industry himself, he may in a short time be able to cope with the various problems which are entailed in practical work. In this day we can call experimental work "wise" when it is based on a knowledge of at least the principles which have been deduced from the cruder experimenting of the past. But we would call it "unwise" if these principles were ignored, and only the cut and dry methods previously employed were adopted. In fact, what is science? Is it a creation of the brain or fancy? Is it the unhealthy emanation of an overworked student whose vigils have weakened his senses? Many practical men seem to think so judging by their talk and even their actions. But is this the real fact after all? Most assuredly it is not. Science is only the outgrowth of practice. The practical man has laid the foundation, and by a careful research and investigation into the work he has done, it has been possible to deduce from a vast amount of his complex attainments a few simple laws and principles which cover the whole ground and which are equally as applicable to a clayworker in one part of the land as in another. In short, science is merely a simmering or boiling-down of practice. It is the vital principles deduced from practice. And when a practical man sneeringly disregards science, he is unknowingly making jest of that to which he claims to be most loyal. It is true that scientists may theorize, and that their theories may occasionally prove faulty; but the fact of an unwise digression of one man in occasionally overreaching should not cast doubtful reflections on the stability and soundness of the underlying principles governing the case; and the mere fact of his theorizing has not altered the true principles from which he may have wandered. The close relationship which exists between science and practice has so often been clearly shown that it seems almost folly to say more on that line.

What can a man with scientific training do to justify the time he spends in gaining it? Suppose a man who was entirely ignorant of all the principles of ceramics had all the glaze and body ingredients known to the potter placed at his disposal, how long would it take him to make some particular kind of ware and make a glaze to fit his body perfectly? It might take him one year, and it might take him twenty; but with the world's present supply of knowledge at the command of a trained man, the number of experiments to obtain a starting point for a successful clay industry would be reduced to a comparatively small number. In order to intelligently attack any special phase of ceramic work it is essential that the clayworker should be equipped with a knowledge of the vital principles as deduced by science from the practice of the past.

We sometimes pause and ask ourselves if the state of perfection in certain lines has not been reached, or if it will ever be reached. Twenty years ago, no doubt, or even a greater or less period than that, men have asked themselves the same question with no further prospects in sight for improvement than are apparent to us to-day. We all know some of the things the last twenty years have done for the ceramic industry, and no one here can feel but what much will be accomplished in the next twenty, and although much has been accomplished in the past, with our increased knowledge still more should be accomplished in the future. It is doubtful if ever the time comes

when the pinnacle of perfection will have been reached, and man ceases to advance. It is utterly impossible for him to remain long on the same plane, and when he ceases to advance he will begin to retrograde.

Since scientists have turned their attention to the clay-workers' field they have wrestled with many of the scores of problems which have so long confronted them, and by the fruits of their labors thus far are we able to divide a clay into its mineral ingredients as well as into the elements of which it is composed. This having been accomplished, opened the doors to a more careful study of the action which each of the ingredients which enter into the composition of the body and glaze, and thus places the present generation in a position to more intelligently experiment than has been possible heretofore. In this age of specialization, to carefully consider the lines of experimenting of one of the many subdivisions which come within the scope of the ceramic industry, or to discuss some particular phase connected therewith, means the furnishing of material for a book. In view of the foregoing, it would be futile to attempt more than one illustration in so limited a paper as this, and I have therefore dealt only with generalities up to this point.

To anyone, therefore, who wishes to experiment in the line of clay-working to-day, and who wishes to do so in what may justly be called a "wise" way, I should say, that on the outset he must learn to use the tools of his profession. The scientific knowledge bearing on the subject of ceramics which has been accumulated so far belongs largely to three branches of science—chemistry, physics and geology.

The most important single contribution, according to my estimation, which has been made to the technology of clayworking is the use of the "chemical formula" as a means of calculation, comparison and experimental work. It has the unfortunate drawback that it requires a thorough understanding of the chemical principles in order to realize or obtain the benefits which its use can bring to the clayworker. The "chemical formula" is, in short, the alphabet—the language—the means of expression by which a modern clayworker is able to express to himself or to others the complex facts with which he deals. To show what is meant by the "chemical formula" and to show its advantages over the cut and try methods previously employed, I cite below a specific case, namely, how to set about to find the working limits of a raw lead glaze on a given body at a given temperature. While it is a well known fact that a given glaze will come to perfect maturity on a given body at a given heat, and that it does not necessarily follow that the same glaze will come to maturity on another body even at a slightly higher temperature or under slightly different conditions, still the following will serve the purpose of illustration. The body in the following series of experiments vitrified at a temperature somewhat above the melting point of gold, but below that of the Seger cone series, being somewhat high in fluxes, and was composed of the following mineral ingredients as shown by a "rational" analysis.

|                      | Per cent. |
|----------------------|-----------|
| Clay substance ..... | 68.12     |
| Quartz .....         | 28.32     |
| Spar .....           | 4.42      |
|                      | 100.86    |

The glaze which had been formerly employed was a very complex one and difficult to make, so I set about to produce as simple a glaze as possible to meet the requirements. I therefore formulated a series of glazes after this general type:

|                      |                                    |                        |
|----------------------|------------------------------------|------------------------|
| .85 PbO              | .16 Al <sub>2</sub> O <sub>3</sub> | 1.6 SiO <sub>2</sub> . |
| .15 K <sub>2</sub> O |                                    |                        |

This is a very soft glaze which I felt quite certain would mature even at a much lower temperature than was wished. I then made a glaze much higher in fusibility which I was confident would not mature. It is represented by the following formula:

|                      |                                    |                      |
|----------------------|------------------------------------|----------------------|
| .85 PbO              | .26 Al <sub>2</sub> O <sub>3</sub> | 2.6 SiO <sub>2</sub> |
| .15 K <sub>2</sub> O |                                    |                      |

Now we have an expression here for two glazes whose fluxing elements are the same and one which is much too soft and one which is much too hard, so we are confident that a glaze somewhere between the two will come to a maturity on this body. I will say just a word in explanation of the formula I have just used. Now, when .85 equivalents of lead is used, it does not mean that 85 pounds was used, nor that 15 pounds of potash was used, etc. These terms simply express the amount of the various ingredients used according to their molecular weight. The ingredients unite to form a compound in definite proportions, and theoretically, if it were possible to analyze a single molecule, each molecule of the glaze, for every part of PbO as expressed in the formula we would find 111½ parts and for the expression of one part of K<sub>2</sub>O we would find 47.1 parts.

I will calculate the simplest glaze formula and you will see more clearly the way to go about it.

(Use of blackboard and verbal explanation at this point.)

|                               |                      |                                    |                      |
|-------------------------------|----------------------|------------------------------------|----------------------|
| .85 PbO                       | .15 K <sub>2</sub> O | .16 Al <sub>2</sub> O <sub>3</sub> | 1.6 SiO <sub>2</sub> |
| .15 "                         | .15 "                | .15 "                              | .9 "                 |
|                               |                      | .01 "                              | .7 "                 |
|                               |                      | .01 "                              | .02 "                |
|                               |                      |                                    | .68 "                |
| .85 Pb O x 114.1 (or 133.5) = |                      |                                    |                      |
| .15 Spar x 278.5 =            |                      |                                    |                      |
| .01 Clay x 129.5 =            |                      |                                    |                      |
| .68 Flint x 3.0 =             |                      |                                    |                      |

The series of glazes as expressed by the chemical formula is as follows:

|                                               |                      |
|-----------------------------------------------|----------------------|
| .85 Pb O } .16 Al <sub>2</sub> O <sub>3</sub> | 1.6 SiO <sub>2</sub> |
| .15 K <sub>2</sub> O }                        |                      |
| " .18 "                                       | 1.8 "                |
| " .20 "                                       | 2.0 "                |
| " .22 "                                       | 2.2 "                |
| " .24 "                                       | 2.4 "                |
| " .26 "                                       | 2.6 "                |

I have in my hand the softest glaze of the series, which you notice is very brilliant, perfectly fused, but shows slight crazing. The highest number is far from maturity. Of the intermediate numbers of the series .2 equivalents of alumina was the highest in the series which matured perfectly. I will not burden you by going into detail with a description of each of these glazes, as those interested will find the trial pieces on the table.

To overcome the crazing defect in the former series a part of the



lead and potash was replaced by lime as expressed by the following formulae:

|                       |                                                           |       |
|-----------------------|-----------------------------------------------------------|-------|
| .75 Pb O              | } 16 Al <sub>2</sub> O <sub>3</sub> 1.6 Si O <sub>2</sub> |       |
| .125 K <sub>2</sub> O |                                                           |       |
| .125 Ca O             |                                                           |       |
| "                     |                                                           | .18 " |
| "                     |                                                           | .20 " |
| "                     |                                                           | .22 " |
| "                     |                                                           | .24 " |
| "                     |                                                           | .26 " |
|                       |                                                           | 1.8 " |
|                       |                                                           | 2.0 " |
|                       |                                                           | 2.2 " |
|                       |                                                           | 2.4 " |
|                       |                                                           | 2.6 " |

In this series it will be noticed that none showed any signs of shivering or crazing. The three latter of this series compare very much in appearance with the corresponding ones in the former series.

Thinking that perhaps no glaze in the former series would come perfect a fourth element was introduced into the RO bases after the following formulae:

|                     |                                                           |       |
|---------------------|-----------------------------------------------------------|-------|
| .7 Pb O             | } 16 Al <sub>2</sub> O <sub>3</sub> 1.6 Si O <sub>2</sub> |       |
| .1 K <sub>2</sub> O |                                                           |       |
| .1 Ca O             |                                                           |       |
| .1 Zn O             |                                                           |       |
| "                   |                                                           | .18 " |
| "                   |                                                           | .20 " |
| "                   |                                                           | .22 " |
| "                   |                                                           | .24 " |
| "                   |                                                           | .26 " |
|                     |                                                           | 1.8 " |
|                     |                                                           | 2.0 " |
|                     |                                                           | 2.2 " |
|                     |                                                           | 2.4 " |
|                     |                                                           | 2.6 " |

The first two of this series are perfectly matured and show no defects, and even with .2 equivalents of alumina the glaze was nearly perfectly matured, if not quite so, the highest numbers showing immaturity in regular order as we ascend the series.

I carried the work still farther, using an increased number of fluxing elements and producing a dark reddish brown glaze composed as follows:

|                        |                                                               |                                      |        |
|------------------------|---------------------------------------------------------------|--------------------------------------|--------|
| .665 Pb O              | } .22 Al <sub>2</sub> O <sub>3</sub> } 2.00 Si O <sub>2</sub> | } .05 Fe <sub>2</sub> O <sub>3</sub> |        |
| .120 K <sub>2</sub> O  |                                                               |                                      |        |
| .055 Zn O              |                                                               |                                      |        |
| .060 Ca O              |                                                               |                                      |        |
| .100 Mn O <sub>2</sub> |                                                               |                                      |        |
| "                      | "                                                             | "                                    | 2.25 " |
| "                      | "                                                             | "                                    | 2.50 " |
| "                      | "                                                             | "                                    | 2.75 " |
| "                      | "                                                             | "                                    | 3.00 " |
| "                      | "                                                             | "                                    | 3.25 " |
| "                      | "                                                             | "                                    | 3.50 " |

In this series the glaze containing as high as 2.75 equivalents of silica matured perfectly, having no defects, and with 3.00 equivalents of silica nearly so; above that they showed the ordinary defects. It will be noticed in this series that the clay elements and the silica contents of the glaze are higher and the number of fluxes increased. This illustrates the fact that the melting point of a mixture of several elements which melt at about the same temperature will be lower than any one of the elements by itself. This principle has been utilized by manufacturers of fusible alarm plugs which melt at low temperatures and thereby turn on the water or ring alarm bells or otherwise give notice of fires before the temperature in the building gets very many degrees above the normal.

So far only the chemical side of the question has been considered. The physical working qualities of the glaze must not be overlooked. From the foregoing series and from others, I find in a general way that .05 equivalents of clay substance are required in order to prevent the glaze dusting off too easily, and that for plain and ornamental work which does not overhang it is perfectly satisfactory in use. In the glaze used it figured about 5 per cent. of the whole. But for overhanging pieces, to insure no difficulty from peeling off in drying or dropping off in the early stage of burning, and to insure perfect adherence, I found that about 9 per cent. of clay substances added in the form of plastic material was necessary.

In the preceding series of tests which I have inadequately explained, I wish to call your attention to two separate facts.

First. The extreme ease and convenience with which a complex mixture of materials like a glaze may be represented by the formula. To try to preserve in mind the character of these glazes by means of pounds and ounces of ingredients used to make them up, or even in the percentages of their ingredients, we would find ourselves hopelessly lost at the very offset of our work. No human mind can carry in view the distinction and fine differences which these glazes show if he is dependent upon simple arithmetic, but by the formula it is easy to recollect and easier still to note and reproduce at will.

Secondly, I wish to call attention to the fact that by the preceding series I have established a point of great value to me in the conduct of my own work. The series, beginning with the first, show that perfect glazes can be made with but simple mixtures of a few ingredients. But it is also shown that by the use of a larger number of fluxing elements without increasing their aggregate amount glazes are obtained of greater fusibility, lower cost, greater elastic limits and resilience. To make a glaze on brick or terra cotta as "safe" as possible we should always strive to make its silica and alumina contents as high as possible. To make it inexpensive, we should avoid the use of lead as much as possible. The preceding series show that by introducing the principle of multiplicity of fluxing bases, that the silica and alumina can be increased and the cost reduced, without sacrificing in the slightest the utility or beauty of the ware.

The preceding illustration, though I am conscious of my own inability to make it as clear as I would like, will serve to indicate my idea of how the work should be done. To a man equipped with these methods of research, the unknown presents a very different front from that which it must present to him who knows only the cut and try. But do not imagine for a moment that I am trying to discourage or ridicule the experimental work of those who have not had these methods nor the advantages which enable them to obtain them.

I have already shown too clearly how numerous are the contributions of the experimenters of the past, who did not know these laws and did not use these methods. I have already acknowledged that these laws and methods, indeed all the sciences, are based on the work of those who have striven in the dark. And also, I have shown that hundreds of instances are not lacking to show how practical and ignorant experimenters in every field have forced their way to facts of the greatest value, in spite of the ridicule of those who represent the scientific side. Such instances are just as sure to come in the future as in the past. The work of experimentation will never cease to add new stores of knowledge to mankind's already great accumulations; the humble worker on the bottom of the ladder has no cause for discouragement or despair. But all things now point toward the fact that in future years the greatest progress and the most useful expenditure of mental force and will will come from him who has prepared and disciplined his mind for the task on which he is to enter. [Applause.]

At the close of Mr. Gorton's paper he was very roundly applauded. Though very technical in character, it was generally conceded to be an exceptionally able document. Vice-President Conway, who had been called to the chair by the President, announced that as there was no apparent desire to discuss the paper and the hour was late, the balance of the programme for the afternoon, consisting of questions for general discussion, would be deferred until the next session.

On motion, the Convention then adjourned.

#### FOURTH SESSION.

Pittsburg, February 17.

The President called the session to order at 10:15, and announced that the first paper of the session would be that of Mr. T. D. Potter, of Springfield, Mass., on the subject: "Why Some Brickmakers Live in Wood Houses."

Mr. Potter: I am in the position of the man who discovers fresh tracks ahead. Yesterday we had a paper on the "Economy of Brick as Compared with Frame Structures," and I



T. D. POTTER, Springfield, Ill.

find that the man who read that paper slid right down my cellar door. However, I will follow him, and try to make as large a mark as we can.

#### WHY DO SOME BRICKMAKERS LIVE IN WOOD HOUSES?

Mr. President and Gentlemen of the Convention:

The question, "Why Do Some Brickmakers Live in Wood Houses?" suggests other questions about which there is a great diversity of opinion, and no matter what answer you give somebody will say the answer is not right. For instance, why does a miller wear a white hat? and why do shoemakers' wives and blacksmiths' horses go bare-foot? Perhaps the best answer to all such questions would be, because they do.

The question has only to do with some brickmakers. I will say right now there are others, including the twenty who stood up last year as living in brick houses, those who live in stone houses, and all brickmakers who live in glass houses.

Having nearly all my life been engaged, and am still engaged in the lumber business, you will understand why this paper is so strongly tinged with wood color. Standing as I do with one foot on a board, the other on a brick, calling one wood-foot, the other clay-foot, you can see how easy it is for me to shift from wood-foot to clay-foot when the way opens.

Why do the majority of all the people of this country live in wood houses? Because the majority have but moderate means, and with from one to three thousand dollars to put in a home more can



be had with the money than with any other material; more flexible in form of construction; more projections and ornaments; and more likely to fit the eccentricities of the occupant.

A common house is evolved from the common conditions of life. When our fathers first came to this country to live there were the ledges of stone, quarries of marble, and immense beds of clay, but over the hills and valleys were standing in all their primitive grandeur the majestic oak, the lofty pine, the spreading chestnut, the beautiful maple, and other trees of beauty and utility as well. The first stage, perhaps, in the development of the new country is what we might call the cabin stage. The log-house with its wide open fire-place, the temporary shelter for cattle, the familiar well-sweep where swings the old oaken bucket. The pioneer commences at once to clear the land, and, as crops increase, in time the new barn is built, and when he has become somewhat forehanded he builds himself the new house, the home, which is characteristic of the man. You look at the man and then at his house. You say he has put something of himself in it. Isn't it the most natural thing in the world that this house should be constructed of wood, the material which seems just adapted to his needs, and at his hand there is material in abundance. There need be no economy in its use. The little red school-house comes at the turn of the road; the church on the hill-top; the town is built (commencing with the shanty period), but when the center of business has become so crowded that it gets above the ground floor, then brick seems to come in to fill a place, and is the material when we get beyond the second story on the town or city street.

As the city grows the people still live in wood houses, and the lumber comes from far and near as best suits the fancy of the builders.

There has been great improvement made in the means used to secure the log, convey it to the mill; and in the wood-working machinery, to saw, plane, mould and finish it; which is as far in advance of the primitive methods of our fathers as the lofty mansion is more commodious, luxurious and better than the log cabin. I have stood by and seen the old up and down saw hitched to the flutter wheel go laboriously through the log, where a man could start it in and go to dinner while it was running the length of the log, sawing perhaps a thousand feet a day. I have seen the circular put in its place, which, by the various devices like steam feed, and with the accompanying machines, live rolls, gang edgers, go through a log and separate it into uppers, selects, commons and culls in seconds. The circular saw was too thick, the waste too much, and out of regard to economy comes the thin band saw that saves one-half the saw-dust, which amounts to one board in eight. Now they are building band mills with teeth on both edges, so that there is no lost motion, taking off a board going back the same as going forward. The other wood-working machinery for finishing the lumber has all been improved to the same degree, resulting in a large output at a small cost. As common a thing as a floor board comes all backed, bored, butted or end matched, and polished from the machine.

The railroads have followed the lumbermen up the divides between the rivers until now there is no standing timber in the country that may not be had and laid down beside the foundation of some brick-maker's house.

When the contractor comes to build the wood house in New England, and compete with brick right near the kiln shed, he gets the frame from, say Vermont, perhaps in part Georgia; the covering boards from Pennsylvania; floor boards from Alabama; clapboards from Wisconsin or the Pacific coast; the shingles from New Brunswick or Washington; the finishing white pine from up the Great Lakes; cedar from across the continent; oak, ash, cypress from the Mississippi Valley. The small house might have in its construction lumber from one-half the States of the Union, and from both ends of Canada. Notwithstanding all the manipulation and transportation from the foreign tree to the local house, the price has come below the cost of the same in brick, and it pleases the man and satisfies the woman. It is being done every day, and it would take more than an array of figures to substitute brick for wood in the common house. When the majority of brickmakers live in wood houses we may well ask if they will continue to do so? It would seem to be about time to evolve the brick house when we hear the pulp mills grinding away at the spruce forests, and realize the part wood plays in the paper industry. And when States like New York are ready to spend millions to buy the standing spruce in the Adirondack region to protect the water supply, we may look for the time soon when the papers will serve an injunction on the spruce lumbermen to quit.

Let us look at the disappearing white pine forests that once covered large portions of the country, notably Maine, Michigan, Wisconsin and Minnesota, a wood adapted perhaps to more uses than any other, a fortune maker to the operator, and yet the haste to realize has led to their rapid destruction. After the cutting comes the fire, leaving desolation in its track, and making it impossible to again gather a crop of pine self-sown. As there are such large areas of worthless land, there is a growing sentiment for the preservation of the forest, and for the planting of wornout and worthless land to white pine and other forest trees.

I have taken the spruce and pine as examples. The same thing is taking place with the other woods. While I do not believe we have come near the point of exhaustion of our lumber wealth, we have come to a time when it will pay to be conservative. And if the iron helps to bear the burden of the wooden beam, and brick takes a larger part in exterior construction, the lumberman would have no cause to complain, as he has come to a time when larger drafts are made upon his diminished resources. The public sentiment will soon awaken the lumbermen to a better conception of the value of standing timber. Should the door to Canada shut together with a bang, and the market once more get into his hands, you might look for higher prices in lumber.

We have to make provision, not only for our increase in population, but also for the increased convenience and elbow room demanded by our people. We think the time has come when the idea of permanence and stability should be more apparent in the ordinary house.

We come now to consider what is necessary for the brickmaker to do to take the field which we believe is now opening up before him. Instead of spending so much of his time in trying to prevent others from going into the brick business, he should let them go in. There are no more wrecks along this line of business than along other industries, and competition is sure to come. Better strive to broaden the field, and enlarge the product. With the broad distribution of our raw material, and the ease with which we can be persuaded by the machine men to go into business, we must not blame people for being in it.

Many things get a start by being talked up, and when once started nothing succeeds like success. Let the brick be made to speak. If there should be twenty at the next meeting of the N. B. M. A. who had built themselves brick houses the coming season, who were ready to stand up and talk about them, it would be more convincing than essays or theories. When the majority of brickmakers live in brick houses look out for a rush of business, because the lumbermen, the coal men, iron, cotton, woolen and paper manufacturers and farmers will want a brick house sure.

To induce people to build brick houses we must illustrate and enforce such considerations as economy, durability, adaptability and ornamentation.

**Economy.**—We may think we have reached a point too low already for the price of our product, and are inclined to combine or do something to raise the price. I think that success lies along the line of a cheaper production. We should not be satisfied with machinery and appliances unless they do good work and do it rapidly. The primitive ways must give place to the perfect. I expect yet to see a simple machine that will place six soft mud brick on a pallet automatically, and all the operations from the time the clay leaves its bed until it leaves the yard in completed form conducted with more skill and less muscle than at the present time. We must keep with the other lines of manufacture, or else when the time comes others will step in ahead of us, and build houses of iron, glass, paper or their combination. We will need to be clayworkers, and not workers in clay, crustaceans or terra cotta men.

**Durability.**—We have this in our favor, and we should make the most of it, keeping it constantly before the home builder with the idea that they are building for the future; that brick gives the home the look of stability, cool in summer, warm in winter, fast color, no paint or putty to rub off.

**Adaptability.**—We should seek to adapt our wares to the market, and if possible produce shapes, sizes and specials that would suggest their usefulness to builders. We must interest the mason, contractor and architect, and all work together to produce a house that will commend itself and bear examination externally and internally, and from every side and point of observation.

**Ornamentation.**—The combinations that can be made with common brick, different colored face brick, terra cotta, hollow blocks, roofing tile, in short, all the clay products, with the recognized building materials in all lines, would seem to be sufficient to call out all there is in us of the artistic and practical. As the house and home may become the dearest place on earth to us, let us make it by all the cunning of our craft the most beautiful, fit dwelling place for those dearest to us, and as our hearts should be, pure and spotless. [Applause.]

#### HOW TO INCREASE THE USE OF BRICK—GENERAL DISCUSSION.

Mr. W. C. Ogden, Binghamton, N. Y.: Mr. President—It seems as though this might be a good idea to follow up; and I would like to make a suggestion. Would it not be a good idea for the Chair, before the close of this Convention, to appoint a committee of three or four to look up this matter, and collect facts and arguments, and have them printed in a short, concise form and distribute them to the members of the Convention to use if they see fit in trying to induce people to build brick houses instead of wooden houses? It seems as though an outlet is all we require. We can make the brick without question; and it seems to me this would be a good idea to follow up and work out, and if a motion is in order I make the motion that the Chair appoint a committee for such purpose.

The President: The motion of the gentleman is this—that the Chair appoint a committee of three for the purpose of collating facts in connection with this matter, and that the report of the committee be printed in pamphlet form. What is your pleasure?

Mr. Eudaly: It strikes me that possibly all such matters should first come before the Association from any committee before being printed. Three or four gentlemen might have certain ideas as to what would be a glorious thing for the brickmakers of this country, and the remainder might think some other way. All such matters should first come before the Convention; and with that understanding, I heartily approve the motion.

Mr. W. D. Gates: I have been thinking for some little time of making a motion somewhat the same as this, and I had drafted a resolution. The idea I had in the appointment of the committee which I advocate was that that committee would take these things into consideration and report at our next annual meeting; and in that case the report of such committee would bring in facts which we would probably want to have published, and the committee would bring them before the Convention for action. I will read my resolution with the permission of the chair.

Moved, That a committee of three be appointed by the Chair to be known as the Committee on the Extension of Trade.

That this committee shall, in the name of the Association, confer with the supervising architect of the United States and with others in authority, to extend the use of clay wares in our public buildings.

That the committee shall work for the extension of the popular movement for good roads.

That they shall also look after the interests of this Association in the matter of a Governmental Department of Manufacture and Commerce.

That this committee shall report at our next Convention.

That it is the sense of this meeting that it is the duty of each individual member to work with and write personally to his congressman and senator urging the more extensive use



of our material in our public buildings, particularly urging the points of the encouragement of home manufacture and superiority of material and that all shall confer with and assist this committee.

I offer this as an amendment to the motion of Mr. Ogden, being in the same line.

The President: The Chair presumes that Mr. Ogden has no objection to withdrawing his motion, and allow the substitution of this. Mr. Ogden must withdraw his motion, or the resolution of Mr. Gates must be offered as a substitute.

Mr. Eudaly: I second the resolution as a substitute.

Mr. Ogden: My idea was not to make the motion so comprehensive, but to confine the matter more particularly to common brick, which would strike quite a number of manufacturers, and not make it so broad. Make it a pamphlet more concise, one that you could hand to a builder or a person contemplating building, and have him look it over, and not burden him with a long list of facts and figures that he is not interested in, which might be the case if it was made on a broader line.

Mr. Eudaly: I suggest that Mr. Ogden's remarks are based upon the very reasons why I so willingly seconded Mr. Gates' resolution. I deem it that the motion offered by Mr. Ogden is narrow in its scope. It has a tendency towards class legislation; that is to say, it reaches only a certain line of the clay industry. It reaches only a certain line of brickmakers representing the Association, whereas Mr. Gates' resolution covers the entire field, and brings the question before us in such shape as we are all interested in it. Mr. Ogden's motion would only refer to brick for building purposes, that is, for building houses. We feel that we ought not to ask the Convention to take up just one branch of the industry that is represented here. For that reason, I trust Mr. Gates' resolution, which is offered as a substitute, will be substituted and passed.

Mr. J. E. Clapp, Vicksburg, Mich.: I second the resolution of Mr. Ogden as being all right. While you may call your congressman's attention to clay products, he certainly will not be interested in the small home building. If he has anything to do, it will be with government buildings, and buildings of that class. I think Mr. Ogden's motion was made to reach the builders of small houses, costing from one thousand dollars up. Both motions are very good, and are both right; but I believe there is quite a strong need of the first motion, because it reaches a larger class of people than the other.

Mr. Gates: Just a word in explanation of my motion. I did not intend that it was simply in the line of government buildings, but that this committee should work to collect data of a general nature which might be published in pamphlet form, and to report that at the next Convention. The committee would neglect their duty if they failed to give attention to the fact that a large amount of brick should be used in the construction of homes, and to urge the construction of brick dwelling-houses would be a part of their duty to further that as much as the use of brick in the construction of government buildings. I simply desired to concentrate all of our interests—some of us make common building bricks, some of us paving bricks, and some of us make terra cotta building material. I intended to concentrate all the interests and bring them in shape, so that instead of dropping this subject now, we would come together a year from now with something definite.

Mr. Charles H. Merrick: While I believe that both these motions are good, I certainly hope that Mr. Ogden's motion will prevail. All over the country the brickmakers are in distress more or less, and need immediate action. This matter should not be delayed a year. A year from to-day, perhaps, many of the brickmakers will be bankrupt from the fact that so many wooden buildings are being put up. Terra cotta and fire-proofing go into the majority of buildings, more or less, and immediate action is needed on this question. If we take action on this matter at this meeting, and some special committee is appointed to work it up, and obtain information from all over the country, and bring it together very soon, and have

it printed in the Clay-Worker and other papers, and also have it printed in pamphlet form, and have it mailed to architects and builders, we will see immediate relief. There is no question in my mind from the data given us yesterday that we can erect a brick building so nearly the same as the price of a wooden building, it is possible that something can be done; but when the builders of the country think they can erect a wooden building cheaper than a brick building, it is time to educate them; and it is the time now to commence this work. I hope the motion of Mr. Ogden will prevail, that a committee be immediately appointed and go to work, and inside of the next three months we will have something formulated which will be sent broadcast over this country. We do not want to wait a year. Where will a lot of the brickmakers be then, judging from the remarks we have heard on this floor? Some have told us they could not make a dollar. It is within our grasp to help them, and I hope the brickmakers of this Convention will take hold of that thing, before ruin stares us in the face. It is true in some sections they are making money, but in others they are not. Few of the buildings in our city are



GRANT DIBERT, Chairman Committee on Entertainment, Pittsburgh.

made of wood; and it pains me when I go around and see beautiful wooden houses put up which cost more than brick. I talk to the architects and builders all the time, and I mean to continue to do so. The brick manufacturers should go into architects' offices, and tell them we have to do something, and have brick that is cheap, and hollow brick to erect a building as cheap as frame; and the majority of people, when they begin to understand it, will build of brick, which is warm, rat-proof and dry. There are many things I might speak of—you do not have to paint it and repair it every year; and when you come to take into consideration all these things, in counting up the cost of a frame building, we soon have a brick building cheaper than a wooden building; and I hope Mr. Ogden's motion will prevail. [Applause.]

Mr. Ittner: I desire to suggest a solution of this question; and I would ask that the substitute be withdrawn, and that we be permitted to act on Mr. Ogden's motion separately, and then that the matter embodied in the substitute may be introduced as a separate proposition and go to a separate committee.



Mr. Gates: I certainly will withdraw my substitute. If it is the sense of this meeting that the immense amount of money to be expended in erecting public and government buildings shall not be looked after; if the department of manufactures, in which we might have quite a place, if that shall not be looked after; if the large interests of the roads in this country shall not be looked after; if that is the desire of this meeting, if we are to have a committee to look after but one branch of our industry, then I shall withdraw the substitute.

Mr. Ittner: With all due respect to Mr. Gates, I do not think what I said called for these strictures. I simply suggested a solution of the difficulty, which I feel we are drifting into, to expedite business. My idea is that we act on Mr. Ogden's proposition separately, and have a separate committee for that purpose; and then after that we can take up the proposition embodied in the substitute amendment, if you please, that portion which might conflict with the proposition of Mr. Ogden, and the appointment of a separate committee for that purpose will be the proper course for us to take. I have more faith in the committees and executive bodies of this Association than Mr. Endaly seems to entertain. Now, I am willing to submit to the judgment of any committee that will be appointed by our Chair; of course, with the understanding that their reports shall be submitted to our officers for review before being printed and distributed. I am willing to submit to the judgment of any committee that may be appointed by our President. I do not have that great fear that something terrible will be done to engulf us.

The President: The first proposition for the Convention to consider is that Mr. Gates withdraws his substitute; and unless there is objection on the part of some member, Mr. Gates' request will be acceded to and the substitute will be withdrawn.

Mr. Endaly: If what I am about to say now is to be cut off by the withdrawal of this substitute, I object.

The President: That is your privilege, to object, or the Chair will accede to Mr. Gates' request.

Mr. Endaly: What I want to say, gentlemen, in all fairness—and I believe Mr. Ittner will accord me this privilege—is that neither he nor any other gentleman has any right to construe my motives. I am addressing the Chairman of this body. Mr. Ittner has no right to say that I said a committee appointed by this body would not be a committee of fair-minded men, which he has taken the liberty of construing. He did not mean to do it, I am sure. I will give you something further. The publication of a pamphlet, such as is contemplated by the original motion, involves quite an expenditure of money; and I believe that there is not a gentleman on this floor who would not heartily indorse the resolution offered by Mr. Gates as a substitute, if it were offered as an original resolution. We are all in favor of it—it represents the combined clay interests, in which there is a large amount of capital invested. Now, if Mr. Gates' resolution is offered as an original resolution, after the other is passed, it means the publication of two pamphlets. I will say to you—it is no secret—that the question of finances in this Association is one which is continually staring us in the face. We have only just come from a meeting of the executive committee where we discussed the feasibility of raising the dues of the Association. If you print two such pamphlets we will certainly have to do that. If the two can be consolidated, so as to have one publication, covering all, I have no objection. I do not object to Mr. Ogden's motion, or a single thing intended to be accomplished by his motion. It is all right, and I do not object to it. My idea is to consolidate the two in order to save expense. If it is the sense of the meeting that the substitute offered by Mr. Gates should be withdrawn, I shall not stand in the way as the seconder of the resolution; and with these remarks I will withdraw my objection.

The President: There being no further objection, Mr. Gates' resolution is withdrawn.

Mr. Randall: I move to amend Mr. Ogden's motion by making a motion that the executive committee be instructed

to issue at once, or as soon as it can be done, the two papers on this subject in pamphlet form, and that they be sent to the members; and that the committee to be appointed under the motion made by Mr. Gates be authorized to proceed with the work of collating and obtaining information of the character intended by Mr. Ogden and Mr. Gates, for subsequent use by the members of the Association. I believe that covers both motions.

The President: I am in the dark. Mr. Randall, whether your motion is properly an amendment to Mr. Ogden's motion. I am really in doubt about it. I think that—

[Calls of "the previous question," "the previous question."]

The President then put the question on the adoption of Mr. Ogden's motion, which was carried.

Mr. Ittner: Mr. President, I would wish to have Mr. Gates bring in his matter now. If he does not wish to do it, and is tired, and wants me to do it, I will do it for him.

Mr. Gates: If I should pursue the course that has been started here, it would mean a succession of committees for each one of these items. I conclude that the Convention does not wish anything of the kind.

The President: The Chair will appoint later the committee called for under Mr. Ogden's motion.

#### A MESSAGE FROM OVER THE SEA.

The Secretary: With your permission, Mr. President, we will turn from tribulation to something pleasant. It is our pleasure this morning to receive a cablegram from the German Society of Brick and Lime Manufacturers, in session at Berlin, saying:

"The German Society of Brick and Lime Manufacturers, in session, sends its hearty greetings and best wishes for a successful meeting of the National Brick Manufacturers' Association of America.

"HOFFMANN, President."

[Applause.]

I would suggest that a cablegram something like the following be sent in reply:

"The National Brick Manufacturers' Association of the United States of America in convention assembled take great pleasure in acknowledging your greeting and assure you we reciprocate your kind wishes most cordially.

"FLINN, President."

The President: With unanimous consent, the Secretary will be authorized to send the message.

The President: We will now take up the next paper, "Brickmakers' Accounts," by Mr. W. H. Hoagland, Cayuga, Ind.

#### BRICKMAKERS' ACCOUNTS.

Mr. President and Gentlemen: The proposition that induces a man to invest in the business of manufacturing face brick reads as follows:

40 M daily capacity.  
\$5 per M. profit.  
\$200 daily profit and counting three hundred working days each year makes yearly profits \$60,000.

Amount to be invested \$75,000 to \$100,000, which will include ample working capital. He is convinced there will not be any trouble to market the entire output for he is going to make brick cheaper than any one else in the business and if he makes half the afore-said profit he will be satisfied, which will enable him to get control of the market by reducing the price several dollars per M. if necessary and still leave a handsome surplus.

This is the brickmakers first dream and if he remains in that frame of mind until he has a sufficient quantity of brick ready to put on the market he will not only place himself in danger of self-destruction but will destroy profit for others.

It is at this point our newly made brother should have a method of keeping his accounts that will give him the details of the business, show him where his money goes and give him the correct selling price at which he can make at least interest on his investment.

In my experience in marketing face brick I have seen the destruction of prices caused by manufacturers who did not know the cost of their product.

During the time I was dealing in pressed brick in Chicago I had a man come into my office with some fine brick. He asked me what they were worth and as I wanted to get them as cheap as possible I put the price down \$1.50 per M below the price I thought he would ask for them but he surprised me by offering a specified quantity at \$1.00 per M less than the price I mentioned. I bought the brick. He expected to make several dollars per M profit, but after the order was filled he told me he lost money, however he thought it was due to some bad luck and was anxious to make



another deal at the same price. He was just starting into the pressed brick business and was thoroughly convinced that he could make first quality pressed brick at a certain low figure and attributed his loss to some bad luck that would surely not occur again. I know of other cases similar to this and I have noted that one manufacturer like the one just mentioned can destroy the prices of several other factories.

If you make a correct distribution of the amount of money you disburse you will find why it is that a man is so deceived in the cost of his brick when he is careless in keeping his accounts. You will find that in one sense of the word he is not so much mistaken about the cost of the brick as he is the cost of the extras.

What is his expense while not running?

What are his repairs costing him.

How many brick has been thrown over the dump.

How much has stock and plant depreciated in value.

How much interest on borrowed money, to say nothing about paying the money back.

How much traveling expenses, advertising and cost of selling.

How much is due him that can't be collected.

How much interest on investment to say nothing of getting back the principal.

These are the points we all are very apt to underestimate and make a mistake in placing the selling price of our material too low.

A man may make face brick for \$6. per M and sell them for \$12 per M and yet lose money. This I will endeavor to illustrate farther on. Some brother may say "I am not an expert bookkeeper myself and cannot afford to employ one. I know what I had the first of last year and I know what I have now and the difference is my loss or my gain." If you will talk to that brother a while he will tell you that the brick business is the most deceiving business he knows of. "About the time you think you can declare a dividend you have to build a new kiln or put in new machinery."

It does not require a heavy force to take care of the accounts of a brick yard. One bright young man or young lady will give one all the statistics he will care to have if the work is properly arranged.

If you employ a new superintendent the first thing you want to know is whether he is making or losing money for you. If you keep your accounts in good shape you will know every day just what he has done for you the day before.

We have been getting better work out of our men since they have learned that their work is checked up every day and I believe that "Red Tape" on a brick yard is a good thing. Our system gives us a check on every man on the yard and we are also able to tell at the end of each month whether we have gained or lost and how much, however I have no doubt there are many here to day that can tell me how to further improve our system and I will be very thankful for any information I can obtain on this point, and on the other hand I have a personal knowledge of many brick makers who are exceedingly careless in keeping their accounts and carelessness in this department of brickmaking is prolific of lower prices for everyone and failures in business. Here is where you find the man that thinks he is making brick cheaper than anyone and he tells you he is going to control the market in his section of the country for he can sell brick so cheap he will drive all others out of the business. If this paper should reach the eyes of such a distressed brother and should turn his thoughts toward the importance of keeping books, I would be most happy and it would be a pleasure for me to help in any way within my power.

It does seem as though we are determined to sell goods at the bottom price and the bottom means the cost price and if there is no remedy for this let us be sure that we do not mistake and get the price below cost. The first position I ever held was bookkeeper in Cincinnati. I did not make very much money at the start, but every Saturday night I used to lay aside a certain amount of my salary for clothes, then another amount for room rent, then for board, etc. By doing this I always kept within my means and always had the money to pay for what I needed. Later I got careless and didn't keep any account of where my money went and I found my cash always short when I needed something. It is just so in the brick business. You must anticipate future demands which can be closely estimated only by aid of statistics of the past. But first we must find the direct cost of manufacturing. It would be impossible to establish a fixed rule that could be applied to all yards for keeping accounts, but I will endeavor to show you a portion of one method; however, there will no doubt be many of you that will say such a method would not work well on your yard. But such fact does not signify that a system cannot be adopted that fit your case. It may be there will be some point in our method that will suggest something of advantage to at least one brother brick-maker.

The figures given here are only intended to illustrate the method of distributing accounts, they are entirely fictitious and do not represent the cost of manufacturing on our yard or any other yard. The figures are arranged to bring about certain results the same as an example in an arithmetic or in a book of instruction on bookkeeping, to show how a brick-maker can keep an account of the distribution of his money and the importance of doing so. It matters not whether the cost as shown here in any particular place be high or low. The figures are not meant to express my opinion of a good days work for Setters, Sorters or Machines, the cost price or selling price, but I mean for you to substitute your own real figures for my fictitious ones and see where you are.

We get the time of our men on time slips, each man making out his own time and stating on the slip what kind of work he performed. These slips are O. Kd. by the foreman or superintendent.

We pay semi-monthly and the "time" is entered on the pay roll direct each day. After entering the "time" the bookkeeper then sorts out the time slips to be entered on the daily report. On this daily report we first record the condition of the weather and if a bad showing is made by our men on a clear day, a storm originates in the office at once. Next we put down the number of brick made, standards and ornamentals, and also for what kiln they are intended in order that we may determine the cost of each kiln separately. The time slips are arranged in groups of men in the different departments and gangs. Our first group consists of superintendent, bookkeeper, night watch, engineer and water boy. We find among these slips dated December 14, time given in for all but the water boy at ten hours each, making forty hours, and their wages combined amounts to \$8.00, which divided by 14 M, the number of brick made that day gives cost per M as 57 cents. We next take the time of all the men that worked in raw clay, including stripping, mining, holting, etc., add them together and we get 100 hours, wages \$13, or 93 cents per M, dividing by number of brick made same day.

Here we find time slip of C. Brown, says worked at "feeding

pan" No. 2, 10 hours, rate \$1.25. Next the time of screen boy, 75 cents, next we have a red card headed "Daily Report, Press No. 2, Dec. 1, 1897." "Brick made, number of loads 28. Quantity 10,500 Standard Buff and 3,500 Cat. 90 Buff, time of machine running, 9 hours. Time stopped" "several stops amounting to one hour," cause of stoppage "Screens out of order." At the bottom of this card the press men give in their time, 10 hours each at \$1.25. We have another slip made out by Davis, transfer man, the man who puts the cars in the dryer, 10 hours at \$1.25. These five men we group together calling them "Machine men" and place on the daily report 50 hours, \$5.75 or 41 cents per M.

It is the duty of the transfer man to fill out in part the "dryer car tag," telling what each car contains, date made and press number; and one of these tags or cards accompanies each load. Next we come to the setters, their time is entered 40 hours, \$6.50, which divided by number of brick set in kiln gives 41 2-3 cents per M for setting. It is the duty of one of the tossers to fill out the balance of the dryer card tag as soon as each is emptied, giving number of the bench in which the brick are set, the kiln number, the number of brick set and the loss, or brick rejected by setters. He also writes on the bottom of the card, causes of loss. He also gives the date brick are set. These cards are thrown into a box and at night collected when the day's work is done. The bookkeeper gets from these cards the quantity of brick set and the total number rejected, if any.

The burners time is next entered on the daily report and also the letter number of the kiln on which he is burning. Following this comes the sorter's work. The number of brick sorted, the time and cost per M. The loading gang is handled in the same manner.

Here is a slip for Jim Smith says worked at general labor 10 hours at \$1.25; next comes Frank Johnson, says worked at repairing screens 5 hours and in repairing dryer, 5 hours. These items



W. H. HOAGLAND, Cayuga, Ind.

are recorded separately on the daily report. And all kiln repairs, building repairs, construction, etc., is entered in like manner. An accurate account can be kept in this manner of every little item of expense put on any piece of machinery, kiln or building.

This daily report is footed up showing amount of pay roll for that day. The total from the pay roll of the day before is added, which gives total amount of pay roll since last pay day, the last footing is carried forward to next day's report.

If your bank account is getting low it is nice to know how your pay roll is running so you can prepare for next pay day.

The next thing we do is to transfer the figures on this report to our distribution sheet. The words appearing in the left hand column of the daily report appear again across the top of the distribution sheet and the amount of money is transferred and put under the proper head thus combining the wages of clay men for a whole month in one column and the same with machine hands and all other groups. The footings of each column on the distribution sheet for the previous month are carried forward to the present month and by so adding the footings from month to month you will have at the end of the year the total amount of money expended in pay rolls, properly distributed, and can tell how much your clays costs you, how much machine hands cost, repairs of machines, kilns, buildings, etc., for the entire year. We also transfer from the daily reports the quantity of brick made each day, the number of brick set and rejected, the number of brick sorted and the amount shipped. The totals are carried forward from one report to the other showing at the end of any month the total number brick made, set, sorted and loaded since the beginning of the year.

This sheet only gives the distribution of the pay rolls, but another similar sheet can be used in distributing all other money



paid out, on the left giving the parties name to whom the money is to be paid, and in the first column to the right giving the full amount of his bill, and then distribute the amount through the different columns farther to the right under the classification at the top of each column that covers the article purchased. If it should be for repairing machinery place the amount under that head.

I have spoken of the desirable effect on the men this bookkeeping has brought about and to illustrate I will refer to the distribution sheet.

First you will note that the cost per M is higher on December 6th, in the groups belonging to clay men, machine men, and superintendent, than on any previous day and the reason for it is plain when you notice that only 10,000 brick was made. The reason for the bad showing was on account of machinery which needed repairs and is evidenced by the fact that on the following day the plant was shut down for repairs and here you can see that \$5 is charged for repairing machinery, and \$8 is placed under the head of wages to superintendent's group. There are two headings for superintendent's group and when machines are not running the wages of these men are placed in a separate column which represent a part of the expense that accumulates while machines are not in operation. When brick are being made this expense goes directly into the cost of manufacturing.

On December 9th the best record was made on setting and it will be seen that we only have \$3.25 recorded, the wages of one setter and one tosser, who set 8,500 brick, but after this kiln of brick is burned and sorted we discover from sorter's card that benches No. 14 and 15 had an extraordinary large percentage of second quality brick, cause, being careless setting. We at once go to the "dryer car tags" and find that benches No. 14 and 15 were set on December 9th by Jerry Donovan, setter, and Frank Smith, tosser. It was the first day Jerry had been alone setting brick and he wanted to break the record which he did, but as you will note he did not reject one brick during the day and did not exercise care in putting them into the kiln. We thus have a check on the setting gang.

Looking farther down on the distribution sheet we notice on the 18th that all rates per M are high. For argument we will say that the "Boss" was away on that day. We start in to investigate; only 22,090 brick made and two presses in operation. The press cards say cause of stoppage "short of clay." We then notice clay men's time is \$1.25 higher than usual and we investigate the trouble with that gang. Setters, sorters and loaders all show a bad day's work, and they are all investigated and the trouble located. The press men are the only ones that seem to have been straight. It was not their fault if they were short of clay, but looking down the sheet farther we note, on the 22d, an extraordinary large amount of brick rejected by setters. We get the "dryer car tags" and on those on which rejected brick are reported the remarks are "bad handling at machine."

The cars showing heavy loss are the 10th, 11th, 13th, 14th, and 15th cars made on December 18th. By the speed of the machine we know that these cars were made between 10 and 12 o'clock and when we have learned that the bad brick all came from the east end of the car and showed signs of having been taken off by a "green man" we go to John, the press man on the east side of machine and ask him where he was between 10 and 12 o'clock on December 18th, he thinks we know all about it and tells us he went to take a drink with a friend and did not get back until noon. In the mean time a friend (inexperienced in handling brick) "takes off" brick for John while he is gone.

While these examples are imaginary, yet they show the possibilities of figures in the way of locating the men who have not done their duty, however I do not want to impress you with the idea that we depend on figures entirely to get good work from our men, for the superintendent is held responsible for their work. If the manager is away for any length of time he can, on his return, look over the distribution sheet, pick out the bad points and get the superintendent to explain the trouble.

It is a check on the superintendent as well as the men for it is his duty to see that every man is at his post and doing his best.

Our men all know that their wages are figured into so much per M, and they take pride in trying to break the record. In this way our method of handling figures has been an advantage to us.

Our superintendent said to me one day when I was talking to him about a bad showing in the machine room: "It is impossible to get the same result every day on any brick yard." This may be true but if you do not get the same result, there is a reason for it and if you will locate the trouble each time and try to remedy it, you will come nearer getting the same result every day than you will if you do not try. This sheet is footed up twice each month, the footings carried out to right balance with pay roll, and as I said before the total footing at the bottom is carried forward to the next sheet.

The labor on each kiln is kept separate by different colored ink or by marking the letter number of the kiln just above the amount in each space. You can see that we stopped making brick for first kiln on December 11, finished setting same kiln on December 16th, and it is burned off December 27th.

The distribution of the pay roll on December 15th appears as follows:

|                                             |          |          |
|---------------------------------------------|----------|----------|
| 1st Burn Kiln A, Superintendents group..... | \$ 83 00 |          |
| Clay men.....                               | 125 00   |          |
| Machine men.....                            | 55 50    |          |
| Setters .....                               | 61 75    |          |
|                                             |          | \$325.25 |
| 2d Burn Kiln B, Superintendent's group..... | \$ 24 00 |          |
| Clay men.....                               | 39 00    |          |
| Machine men.....                            | 17 25    |          |
|                                             |          | \$ 80 25 |
| Sorting .....                               | 41 63    |          |
| Loading .....                               | 35 73    |          |
| General labor.....                          | 1 25     |          |
| Machinery repairs.....                      | 6 25     |          |
| Kiln repairs.....                           | 11 25    |          |
| Building repairs.....                       | 2 50     |          |
| Expenses not running.....                   | 8 00     |          |
|                                             |          | \$512 11 |

These figures are carried to their respective places in the ledger and when a kiln is burned off we have a kiln report reading as follows:

Kiln A 1st Burn.  
Contains.....137,190 Standard Buffs  
10,850 Octagon Buffs.

Total ..... 148,040

Began manufacturing December 1st, finished burning December 27th. Time water-smoking, four days. Time burning eight days.

Manufacturing.

Superintendent, bookkeeper, night watch and engineer .....\$ 83.00 or 56c per M  
Clay ..... 125 00 or 84½c per M  
Fuel to engine..... 66 60 or 45c per M  
Machine hands..... 55 50 or 37½c per M  
Setting ..... 63 12½ or 42½c per M  
Supplies, oil, etc..... 22 20 or 15c per M

Cost, set ready to burn.....\$415 42½ \$2 80½

Burning.

Burner's wages.....\$ 61 25 or 41 1-3 per M  
Wood used..... 11 84 or 08 per M  
Coal used..... 222 00 or \$1 50 per M

Total .....\$295 09 \$1 99 1-3 \$1 99 1-3

Total cost per M.....\$4 80

Estimating cost of sorting at 70 cents and of loading at 30 cents we have brick loaded on cars for \$5.80 and at market price of only \$10 per M it does look as though we ought to get rich, but as this point is where brickmakers make a mistake. Let us see how the years business shows up. The footings for the year show that total number of brick made was 3,632,000, there was 92,000 rejected by the setters and 440,000 loss in burning, leaving 3,100,000 merchantable brick delivered from kilns to yard. Therefore in getting the cost per M of each department for the year we divide by the number of good brick taken from kilns. Now let us see how the cost per M for the years business compares with the kiln report that shows cost of making brick \$4.80 per M. Taking the footings at the end of the year and dividing by 3,100,000 we have:

Wages, Superintendent, bookkeeper, night watch and engineer.....\$1,728 00 or 56 per M  
Clay men..... 3,220 00 or \$1 04 per M  
Machine hands..... 1,329 00 or 43 per M  
Setting ..... 1,562 00 or 50½ per M  
Fuel to engine..... 1,550 00 or 50 per M  
Supplies, oil, etc..... 775 00 or 25 per M

Cost ready to burn.....\$10,164 00 or \$3 28½ per M

Burning.

Burners' wages.....\$1,470 00 or 47½ per M  
Wood used..... 310 00 or 10 per M  
Coal used..... 5,301 00 or \$1 71 per M

\$2 28½ \$2 28½

Total cost per M.....\$5 57

Sorting ..... \$2,170 00 or 70c  
Loading 1,600,000 brick..... 560 60 or 35c  
General labor..... 250 00 or 08c  
Repairing machinery, labor..... 325 00 or 10½c  
Machinery repairs bought..... 449 50 or 14½c  
Dryer repairs..... 150 00 or 05c  
Dryer repairs bought..... 93 00 or 03c  
Kiln repair labor..... 480 00 or 15½c  
Kiln repairs bought..... 77 50 or 02½c  
Building repairs..... 93 00 or 33c  
Nightwatch, etc., while not running..... 930 00 or 30c

Total for the year.....\$22,823 00 or \$7 54

When we read our kiln report we thought we would get brick loaded on cars for \$5.80 per M, but now we find the cost up to \$7.54.

As shown on the distribution sheet we have loaded 1,600,000 brick and we will say that these sales have averaged \$12.00 per M. Now let us see how much money we have made. According to the figures, we have paid out during the year \$22,823.00 for manufacture and repairs, add \$2,500.00 for manager's salary, \$600.00 for traveling expenses, \$850.00 for sundries (including advertising, express on samples, stationary, taxes, etc.), \$1,500.00 interest on borrowed money, and we have \$28,273.00 as the total expenditures for the year.

What have we to show for this:

Have sold 1,600,000, average \$12 per M.....\$19,200 00  
Lost in bad accounts..... 800 00

Balance in cash and good accounts.....\$18,400 00

Stock on hand

200 M., F. O. B. cars in yard (market price) \$12..... \$2,400 00  
900 M., F. O. B. cars in yard (market price) \$10..... 9,000 00  
400 M., F. O. B. cars in yard (market price) \$5..... 2,000 00

1500 M., F. O. B. cars in yard (market price).....\$13,400 00

Estimated cost loading, selling and bad accounts, \$2.50 per M, on 1,500 M equal to \$3,750.00.

Full value of brick as they stand.....\$ 2,650 00  
Cash and accounts..... 18,400 00  
Stock on hand..... 9,650 00

Total .....\$28,050 00

Cash paid out.....\$28,273 00

Assets ..... 28,050 00

Loss .....\$ 223 00

According to the arrangement of these figures we have made brick at a cost of \$5.80 per M, sold them for \$12.00 per M and yet lost \$223.00, but is this all the loss? Let us see—

Capital stock paid in.....\$50,000 00

Bonded indebtedness..... 25,000 00

Total investment.....\$75,000 00

Six per cent. interest on bonds has been paid, but where is the money coming from to re-pay the loan?

If we hadn't put \$50,000.00 in this business it would have been



DISTRIBUTION SHEET OF THE BLANK PRESS BRICK CO..

Showing Items of Cost of Manufacture taken from the Daily Reports and Time Slips.

The figures do not represent the actual cost of any particular yard, but are intended to convey the idea of detail necessary to a full understanding of all the elements of cost of production.

| DATE.       | Square brick made. | Ornamental brick made. | Wages, Supt. B. K. N. W. Engr. | Cost per M. | Wages, clay men. | Cost per M. | Wages, machine hands. | Cost per M. | Square brick set. | Ornamental set. | Rejected brick. | Wages, setters. | Cost per M. | Wages, burners. | Brick sorted. | Wages, sorters. | Cost per M. | Brick loaded. | Wages, loaders. | Cost per M. | Wages, machinery repairs. | Wages, kiln repairs. | Wages, building repairs. | Wages, construction. | Wages, Supt. B. K. N. W. Engr. |
|-------------|--------------------|------------------------|--------------------------------|-------------|------------------|-------------|-----------------------|-------------|-------------------|-----------------|-----------------|-----------------|-------------|-----------------|---------------|-----------------|-------------|---------------|-----------------|-------------|---------------------------|----------------------|--------------------------|----------------------|--------------------------------|
| Dec. 1.     | 10,500             | 3,500                  | \$8.00                         | .57         | \$13.00          | .93         | \$5.75                | .41         | .....             | .....           | .....           | .....           | .....       | .....           | .....         | 15,100          | \$10 25     | .68           | 24,500          | \$6.25      | .25 1/2                   | .....                | .....                    | .....                | .....                          |
| " 2.        | 11,250             | 3,750                  | 8.00                           | .53 1/3     | 13.00            | .86 2/3     | 5.75                  | .38 1/3     | .....             | .....           | .....           | .....           | .....       | .....           | .....         | 18,000          | 10.88       | .60 1/2       | 30,000          | 8 10        | .27                       | .....                | \$2.50                   | .....                | .....                          |
| " 3.        | 12,000             | 4,000                  | 8.00                           | .50         | 13.00            | .81 1/3     | 5.75                  | .36         | 9,700             | 3,200           | 100             | \$6.50          | .50 1/3     | .....           | .....         | 15,500          | 10 25       | .66           | 36,000          | 10.88       | .30 1/4                   | \$1.25               | .....                    | .....                | .....                          |
| " 4.        | 15,500             | .....                  | 8.00                           | .50 1/6     | 13.00            | .85         | 5.75                  | .37         | 11,700            | 3,900           | 400             | 6.50            | .41 2/3     | .....           | .....         | 16,000          | 10 25       | .64           | 34,000          | 10.50       | .31                       | .....                | .....                    | .....                | .....                          |
| " 5.        | .....              | .....                  | 5.50                           | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 6.        | 10,000             | .....                  | 8.00                           | .80         | 13.00            | \$1.30      | 5.75                  | .57 1/2     | 11,950            | 3,750           | 200             | 6.50            | .41 1/2     | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 7.        | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 8.        | 16,000             | .....                  | 8.00                           | .50         | 13.00            | .81 1/3     | 5.75                  | .36         | 14,190            | .....           | 310             | 6.50            | .45 2/3     | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 9.        | 16,000             | .....                  | 8.00                           | .50         | 13.00            | .81 1/3     | 3.75                  | .36         | 8,500             | .....           | .....           | 3.25            | .38 1/4     | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 10.       | 32,000             | .....                  | 8.00                           | .25         | 21.00            | .66         | 9.50                  | .29 2/3     | 15,500            | .....           | 500             | 6.50            | .42         | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 11.       | 16,000             | .....                  | 8.00                           | .50         | 13.00            | .81 1/3     | 5.75                  | .36         | 15,800            | .....           | 200             | 6.50            | .41         | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 12.       | .....              | .....                  | 5.50                           | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 13.       | 14,000             | .....                  | 8.00                           | .57         | 13.00            | .93         | 5.75                  | .41         | 16,100            | .....           | 400             | 6.50            | .40 1/3     | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 14.       | 15,000             | .....                  | 8.00                           | .53 1/3     | 13.00            | .86 2/3     | 5.75                  | .38 1/3     | 15,850            | .....           | 150             | 6.50            | .41         | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 15.       | 16,000             | .....                  | 8.00                           | .50         | 13.00            | .81 1/3     | 5.75                  | .36         | 14,900            | .....           | 100             | 6.50            | .43 1/2     | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 16.       | 184,250            | 11,250                 | \$107.00                       | .....       | \$164.00         | .....       | \$72.75               | .....       | 134,190           | 10,850          | 2,360           | \$61.75         | .....       | .....           | .....         | 64,600          | \$41.63     | .....         | 124,500         | \$35.73     | .....                     | \$6.25               | \$11 25                  | \$2.50               | \$8.00                         |
| " 17.       | 31,000             | .....                  | 8.00                           | .26         | 21.00            | .68         | 9.50                  | .30 2/3     | 2,000             | .....           | 100             | 1.37 1/2        | .45 2/3     | .....           | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 18.       | 30,000             | .....                  | 8.00                           | .26 2/3     | 21.00            | .70         | 9.50                  | .31 2/3     | 11,300            | .....           | 200             | 6.50            | .57 1/2     | \$2 75          | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 19.       | 22,000             | .....                  | 5.50                           | .36 1/3     | 22.25            | 1.01        | 9.50                  | .43 1-5     | 16,200            | .....           | 300             | 6.50            | .40         | 3.75            | .....         | 5,000           | 5.25        | \$1 05        | 12,000          | 6.25        | .52                       | 1.25                 | .62 1/2                  | 2.00                 | .....                          |
| " 20.       | 32,000             | .....                  | 8.00                           | .25         | 21.00            | .66         | 9.50                  | .29 2/3     | 30,000            | .....           | 500             | 13.00           | .43 1/3     | 3.75            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 21.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | 31,700            | .....           | .....           | 13.00           | .41         | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 22.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | 29,000            | .....           | 2,000           | 13.00           | .45         | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 23.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | 28,000            | .....           | 500             | 13.00           | .46 1/2     | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 24.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 25.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 26.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 3.50            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 27.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 28.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 29.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 30.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| " 31.       | .....              | .....                  | .....                          | .....       | .....            | .....       | .....                 | .....       | .....             | .....           | .....           | .....           | .....       | 6.25            | .....         | .....           | .....       | .....         | .....           | .....       | .....                     | .....                | .....                    | .....                | .....                          |
| Fr. 15th    | 115,000            | .....                  | \$37.50                        | .....       | \$85.25          | .....       | \$38.00               | .....       | 159,200           | .....           | 3,900           | \$64.87 1/2     | .....       | .....           | .....         | 5,000           | \$5.25      | .....         | 12,000          | \$6.25      | .....                     | \$11.75              | \$50.25                  | \$3.62 1/2           | \$38.50                        |
| Foot'g      | 184,250            | .....                  | 107.00                         | .....       | 164.00           | .....       | 72.75                 | .....       | 134,190           | .....           | 2,360           | 61.75 1/2       | .....       | .....           | .....         | 64,600          | 41.63       | .....         | 124,500         | 35.73       | .....                     | 6.25                 | 2.50                     | \$32.00              | 8.00                           |
| Total..     | 299,250            | \$11,250               | \$144.50                       | .46 1/2     | \$249.45         | .80         | \$110.75              | .36         | 293,390           | 10,850          | 6,260           | \$126.62        | .42         | .....           | .....         | 69,600          | \$46.88     | .67 1/2       | 136,500         | \$41.98     | .31                       | \$18.00              | \$61.50                  | \$6.12 1/2           | \$76.50                        |
| * 3,200,750 | .....              | 120,750                | 1,583.50                       | .....       | 2,970.55         | .....       | 1,218.25              | .....       | 3,126,610         | 109,150         | 85,740          | 1,435.37 1/2    | .....       | .....           | .....         | 3,030,400       | 2,123.12    | .....         | 1,463,500       | 518.02      | .....                     | 307.00               | 418.50                   | \$352.00             | \$53.50                        |
| For yr.     | 3,500,000          | 132,000                | \$1,728.00                     | .56         | \$3,220.00       | \$1.04      | \$1,329.00            | .43         | 3,420,000         | 120,000         | 92,000          | \$1,562.00      | .50 1/2     | .....           | .....         | 3,100,000       | \$2,170 00  | .70           | 1,600,000       | \$560.00    | .35                       | \$325.00             | \$180 00                 | \$93.00              | \$930.00                       |

\* From last month's report.

Wages, general labor: Dec. 4, \$1.25; Dec. 27, \$2.50; Dec. 28, \$2.50; from Dec. 1, \$5.62 1/2; footing, \$1.25; total for month, \$6.87 1/2; from last month's report, \$243.12 1/2; total for year, \$250.00.

Wages for dryer repairs: Dec. 18, 62 1/2 cents; Dec. 21, \$1.25; total for month, \$1.87 1/2; from last month's report, \$148.12 1/2; total for year, \$150.00.

Cost per M: Dec. 15, \$512.11; pay-roll of Dec. 31, \$503.25; total pay-roll for month, \$1,015.36.



drawing at least 5 per cent. interest, which would have been \$2,500.00 per year, so this amount is loss.

The plant and stock has depreciated in value, how much? Make it light and say 5 per cent., now 5 per cent. on \$75,000 is \$3,750, and that is loss.

Perhaps there is only clay enough in your immediate vicinity to last thirty-seven years and as the plant is no good without clay this would cause another depreciation of \$2,000.00 per year.

If every brick on the yard had been sold the showing would have been no better for the stock on hand is counted at full market value.

I know of a plant of large capacity engaged in manufacturing common brick where they only have a thin stratum of surface clay. The company has been successful in as much as their stock has been dividend paying, but now after having been in operation for years working off this clay they find it unprofitable to manufacture brick and meet competition, as they now have to carry their clay so far it is very expensive. If this company had been conservative at the beginning and looked into the future they would have foreseen that after a number of years their clay would be so far away companies might be in operation by that time with clay more handy and would probably take the business away from their plant and if they should expect to get their investment returned to them they must fix their price per M at the start high enough to allow them sufficient surplus to set aside a given amount each year to apply on the original investment.

For example if they conclude that 20 years was their limit, making twenty millions per year and the investment was \$100,000 they would have to add to the cost of their brick \$5,000.00 per year which would 25 cents per M on twenty million output.

How many of us are at the present time anticipating what our expenses of gathering clay will be in twenty years from now and what our chances will be at that time for competing with newer companies? I refer to this to bring out the point that it is not enough to get interest only on our investment, but our prices should be such that we will get part of our original investment returned every year. I am satisfied that if every manufacturer of face brick in the United States knew just what his product was costing him including repairs and depreciation of plant and stock, prices would be higher and it would not only benefit us but the machine and kiln men would be greatly benefited if they could refer to prosperous companies in operation.

Many of us blame the machine men for our low prices occasioned by unfair competition, but are they alone to blame. Place ourselves in the act of selling brick. If we go to a man and argue with him to build a large office building in order that we may sell him a bill of brick or terra cotta, we figure out to him that he will get certain returns, if he rents a certain per cent of the offices, we do not guarantee that he will rent all of them, we do not guarantee that every tenant will pay his office rent, we do not guarantee the cost of keeping the building in repair. The capitalist does not rely wholly on our statement, nor does he go to other brick makers to investigate, but he goes to the owners of other office buildings to get cost of repairs, etc.

A salesman, in any line of business, never tells the dark side, nor should he do so, but he gives all the good points and leaves the customer to investigate the other side.

Every man before putting his money into this business should investigate through others already engaged in manufacturing brick and he is foolish if he relies entirely on the representations made by our brothers engaged in furnishing brick yard supplies. They cannot be expected to represent the dark side of our business and the chances are they do not know enough about the dark side to tell it if they were so disposed. We must take a

good share of the blame for low prices on our own shoulders, and if our brothers in the machine business promote new companies let us endeavor at once to get these companies into our association and give them such information as will prevent them from rushing into self destruction for which we all have to suffer more or less.

If it were known to this association that 20 per cent. of the manufacturers in the United States were deceiving themselves as to the cost of their product, thereby causing a depression of prices, to the extent of only 10 cents per M. The amount of loss to us would be enormous and sufficient to justify this association in taking steps toward establishing a bureau of information, or if needs be, employing an expert accountant to whom all members of this association could apply for information, as to a correct method of keeping their accounts. If every member of the National Brick Manufacturers Association would keep his accounts in such a manner as would enable us to gather accurate statistics as to the average cost of the "extras" on a brick yard, I think we would have information that would be worthy of discussion at our conventions, and would be along the line of thought that would influence us toward better prices.

In conclusion, for the benefit of those who desire to ascertain the amount of gains or losses every month, I would suggest that you divide your accounts into two classes, one for the manufacturing department, and the other for the sales department. Let the former sell to the latter all the merchantable brick that comes from the kilns, at a price that will surely cover all cost of repairs, depreciation of plant, etc., and then let the sales department make your dividends on the profits above the prices allowed the manufacturing department. This will give you fixed prices at which your stock can be recorded on the inventory. You will find by this method the manufacturing department will show surplus at times. Do not treat such surplus as profit, but let it remain, for you may need it later on.

Even if we could reach the degree of perfection in manufacturing that so many of us here are striving for, we still would not be proof against failure so long as we are without that information, which can only be obtained by a correct system of keeping accounts. (Applause.)

“BRICKMAKERS’ ACCOUNTS”—GENERAL DISCUSSION.

The President: In opening the discussion on this paper, the Chair will recognize Mr. J. Parker Fiske, of Boston. It is a very important matter to this Association, and a pleasure to the Chair, to see the number of young men in attendance at this Convention, and Mr. Fiske is one of the young men.

Mr. Fiske: Mr. President and Gentlemen—I assure you that when I left Boston I had no idea of addressing this Association, or taking any part in its discussions. I came to listen and not to talk, being a new member of the Association, and only recently having entered the brickmaking fraternity. I expect, of course, to take my place as one of the members of the Association, and contribute my mite in the time to come.

At this time I feel a great deal like the man who directed,

while on his death bed, that on his tombstone should be carved these words: “I expected this, but not so soon.” [Laughter.]

I feel, gentlemen, that it would be presumption for one who has been in the brick business only a year and a half to undertake to tell you gentlemen who have grown old and gray in the manufacture of clay products, how you should manufacture those articles. But coming from the electrical manufacturing business, I thought possibly that on the subject of factory accounting I might be able to throw a little light upon the subject.

The electric light, as you know, is the strongest and most powerful light; and possibly a little light from the manufacture of electrical apparatus may be of interest in the manufacture of clay products.

In referring briefly to

| CAYUGA PRESS BRICK CO.,                     |         |                        |                                         |  |                                                                                                                                                                             |
|---------------------------------------------|---------|------------------------|-----------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DAILY REPORT.....189                        |         |                        | WEATHER.....                            |  |                                                                                                                                                                             |
| KIND OF BRICK MADE TO-DAY.                  |         |                        |                                         |  |                                                                                                                                                                             |
|                                             | HOURS.  |                        | AMT. TO<br>PAY ROLL.                    |  |                                                                                                                                                                             |
| Stripping<br>Pumping<br>Mining<br>Hoisting  | } Clay. | Car Stored             |                                         |  | Best prev. record...Hrs...Cars Stored...Date...<br>Remarks                                                                                                                  |
| Engineer<br>Night Watchman<br>Manufacturing |         | } Mfg.                 | Brick Made                              |  |                                                                                                                                                                             |
| Setting                                     |         |                        | Brick Set    Kiln No.<br>Brick rejected |  |                                                                                                                                                                             |
| Burning                                     |         |                        |                                         |  |                                                                                                                                                                             |
| Brick Sorting                               |         | Brick Sorted           |                                         |  | Best prev. record...Hrs...Brick stored...Date..<br>Remarks                                                                                                                  |
| Loading                                     |         | Brick Loaded           |                                         |  | Best prev. record...Hrs...Brick Loaded...Date..<br>Remarks                                                                                                                  |
| Grinding                                    |         | Brick Ground           |                                         |  |                                                                                                                                                                             |
| Kiln Repairs<br>Building repairs            |         |                        |                                         |  | Supplies, etc., ordered to-day                                                                                                                                              |
| Machine Repairs                             |         |                        |                                         |  | COAL RECEIVED<br>Car No... Initials... Weight... From...                                                                                                                    |
| Dryer Repairs                               |         |                        |                                         |  | “        “        “        “                                                                                                                                                |
| General Labor                               |         |                        |                                         |  | Wood received... Cords... From....                                                                                                                                          |
| Construction                                |         |                        |                                         |  | “        “        “        “                                                                                                                                                |
| Superintendent<br>Book Keeper<br>Manager    |         |                        |                                         |  | Yard Supplies received.... From....<br>“        “        “        “<br>Other material received....        “<br>“        “        “        “<br>“        “        “        “ |
|                                             |         |                        |                                         |  | COAL DELIVERED TO<br>Kiln No..... Kiln No.....<br>Engine Room.... Pump....                                                                                                  |
|                                             |         | Total from last report |                                         |  | Wood delivered to Kiln No..... Kiln No...                                                                                                                                   |
|                                             |         | Total                  |                                         |  | Began watersmoking, Kiln No.....<br>Began burning, Kiln No. ....<br>Finished burning, Kiln No....                                                                           |
| General Remarks.                            |         |                        |                                         |  |                                                                                                                                                                             |



the electrical manufacturing business. I will say that it covers a very wide field. The company which I was connected with manufactured machines weighing seventy-five tons, and also manufactured the small incandescent lamps which you see on these chandeliers; and it's very necessary, in that kind of business, to pay close attention to the matter of accounting. I presume we manufactured several thousand different appliances, and it was necessary, in fixing the price on these, to keep an accurate account of the cost of manufacture. So that I have been trained in that line, and in entering a new line of business, possibly I may say some things which I could not if I had always been in the clay business. In talking with an expert accountant, who, by the way, was an Englishman by birth and education, a gentleman in New York City, who has given great attention to the matter of factory accounting, I have found that in his opinion American manufacturers of all classes of products pay far less attention to the matter of accounting than they do in England. They have been established much longer than our manufactories, competition has been sharper for more years, and it has been necessary for them to figure things down finer than we do. In the tremendous development of this country, and the great growth of our industries, and large profits of the past, we have not been obliged to determine accurately the cost of our goods. There was profit enough in it, no matter what the cost was, and we were all satisfied; but times are changing, and we are coming to the conditions which prevail in England, more factories and sharper competition and lower prices; and it behooves a manufacturer in any line of goods to base matters accurately on the cost of production of his goods, so that I feel that this paper which has been read this morning is of great value to the Association. It opens up a very important field, and is worthy of the close consideration of every one of us. I think we are greatly indebted to the gentleman who read the paper for his very full explanation of his system. Of course, no one system will apply to every factory, but the principles are the same. The idea is to keep an accurate account of exactly where the labor and where the material goes. If you are manufacturing one line of goods, like one kind of brick, the individual cost of which is about the same, from day to day, then it is desirable or necessary for you to know only how much each department of your factory is costing you; and I feel sure, from the experience I have had recently in studying figures in our own factory, if you were able to analyze your expenditures you would be very much surprised in some cases. If, however, you are manufacturing several lines of goods, then the problem is more complicated, if you want to know not only how much you are paying for the mining of the clay, and making of the brick, and burning of the brick on the average, but you want to know how much each different kind of product is costing you.

In the factory with which I am connected we make a variety of building brick, a large variety of fire-brick, and an enormous variety of special fire-brick shapes; blocks for boiler settings, for locomotives, for bakers' ovens and for blast furnaces. Each of these four different classes of goods costs a different price, and we get a different price for them in selling. Now the first question which the salesman will ask the factory superintendent is: How much shall I ask for this line and that line? For instance, here is a customer who comes into our office to buy some building bricks. We show him two kinds of bricks, this kind and that kind; a different color, perhaps, and a different price. The question is, how much more for this one than that one; and if there is more profit in one brick than in the other, that is the kind of brick we ought to lead our customer to buy if possible. A good salesman has his customer largely in his own hands in the matter of directing him toward the kind of product he is to buy. These questions can only be answered by a careful analysis of your methods of manufacture and the keeping of your accounts in such a way that you can tell accurately how much a Roman brick costs as compared with a standard brick; how much boiler settings cost per hundred cubic inches as compared with bakers' oven tiles, so that

in our particular case the method which has been so carefully elaborated and developed in the paper read will have to be changed somewhat, in order that we may determine the necessary information.

Before going into any detail, I want to say that such a system as has been laid out has been in operation in our factory for some years, and it is not a complicated system. It is not a system which requires an expensive bookkeeper; it is not a system which overloads the foreman and men with so much red tape that they cannot do a good day's work. It is simple and can be carried out with little expense and great practical benefit and profit. In our case we have a young man to whom we only pay seven or eight dollars a week, and he does the work and has lots of time to spare.

There is one point which has not been sufficiently emphasized and which I think deserves a few words of comment and that is the moral effect upon the men of such a system. It is wonderful, when you introduce such a system as has been mapped out, the great moral effect it will have on the men, and how it will stimulate their energy and stimulate their attention in doing their work well. If a foreman feels that he



U. J. MATSON, Falls Creek, Pa., Soloist of The Vaseline Quartet.

is likely to be called to the office to-morrow morning to explain why the goods he manufactured the day before cost fifteen cents more than they ought to cost, he is going to be careful how he operates his department. The particular system which we have recently adopted in our factory differs from the one which has been outlined, in that it keeps an account of each different article that is manufactured; charging that article, or the account of that article, with all the material and labor that goes into it, and crediting the article with all the perfected goods which are obtained, and in that way we can tell exactly what these perfected goods are costing us. In order to do that, we lay down the rule that no work shall be performed in the factory without an order, the order being numbered, and the workman's time on his time-slip being specified under that order number. If he works on several orders during the same day he has his order placed before him on a blackboard, and uses that order number with the corresponding time which is placed upon it in making his entry on the time card. That system, of course, when it was first introduced,



was somewhat of a stumbling block to the men, but they were enabled very quickly to carry it out successfully. One or two questions were asked of the gentleman during the reading of the paper, as to the men who could not write. We have many men who cannot write, but we get their time-cards every morning. They take them home and get their children to write them for them, or get their associates to write them. The time-cards are checked by the foreman and the work proceeds smoothly and satisfactorily. I am sorry we have not had the system in operation long enough for me to speak with positiveness as to its ultimate successful working, but so far as we have gone with it, it seems to be filling our requirements. Of course, changes will have to be made from time to time to fit the needs of the case. I believe that the matter of accounts is one that deserves a great deal of attention on the part of brick manufacturers. In the electrical manufacturing business one of the principal banes of the business was the fact that so many new concerns went in without an adequate knowledge of the cost of manufacture. They would go in and cut prices and sell apparatus and get orders and do business for a year or two and then fail. As soon as they failed and stepped out, there would be some other concern ready to step into their shoes, so that it kept the man who fully understood his business and cost of his manufacture on the anxious seat all the time, on account of this competition which came from ignorance of the cost of manufacture; so that I am glad the paper has been presented, and I hope the subject will continue to receive the attention of the Association from time to time as the Conventions are held. [Applause.]

The President: Is there any other member who desires to discuss this proposition further?

Mr. M. E. Gregory, Corning, N. Y.: I did not expect to speak on this subject, but I will say that we have been following these lines for two years, although not as completely as Mr. Hoagland; but at the same time we get nearly the same results. We have found, in the first place, that it is not wise to ask the men to make their time reports. We tried it at first, and at about ten minutes before six they wanted to quit work and make out their time reports. It is too costly, and now we have a timekeeper who goes through the factory. His business is to take the time of all the men, and my business is to divide it into departments each by itself and superintend the whole. Each department is classified and reported to me by the timekeeper in the morning, so that at nine o'clock in the morning I can tell what the brick will cost in each and every department. At that time I call in the superintendent and make a statement to him of what the brick has cost the day before, and if there is a variation I ask him to account for it. We are thus enabled to tell every day what the brick costs, and to keep an exact control of the business each day, and not wait a month or a year for a comparison of the expenses and receipts to find that there is a balance on the wrong side. The men know that they will be checked up every day, and, consequently, the foreman in each department makes a special effort to keep his daily report up to the standard. I think there is a great deal to be said on this matter, and it is a subject that brickmakers ought to follow out more fully. A great many brickmakers say, "I had so much a year ago and I have so much to-day." That is not the question. We ought to take it up in a businesslike way and follow out our work on the lines laid down in the paper.

Mr. W. S. Purington, Galesburg, Ill.: I am always ready to talk on a subject of as much importance to brickmakers as this. I wish to say, in the first place, that I think Mr. Hoagland is wrong in making out a daily statement. Of course, that may be all right as applied to small works, but when you take a yard with three hundred and fifty men it is a good deal of work to make a statement daily of each department; and while we used to run for twelve months without knowing what we were doing, we know now at the end of every thirty days what we are doing. There is one other matter in which I think he makes a mistake, and that is inventorying his brick at the mar-

ket price. That is a place where we make mistakes—trying to inventory brick and putting a fictitious value on it which we will probably never realize. If we inventory them at cost it is high enough.

Mr. J. F. Smith, Omaha: I come from out West, and all our brick is made by contract. We know what they will cost before we start. We have so many men in a gang to run a machine, and they get so much for making so many thousand brick a day. The number of bricks are counted each night. The wheelers wheel the clay for so much a thousand. A setter has three wheelers; he sets for three men, and when his day's work is done his compensation is figured by the thousand brick. All our work is done by the thousand, and we find it to be wholly successful. That is for common brick. I do not know that we could operate a pressed brickyard that way, because the men would get to be careless in handling the brick. There is one thing about the paper which I desire to mention. A pretty smart man in the yard could figure out about what the brick costs. He could figure out how much the brick costs as nearly as you can. He has the thing laid out and says, so much for wheeling, so much for setting, so much for burning, and the brick costs so much, and you are getting so much, and we are getting so much a day, and you are making too much money. He would say the brick costs \$6 to make and you are getting \$12, so that you are making 50 per cent. profit. They will then consider that they should receive more wages. They do not consider what it costs to deliver the brick and the expenses of accounting and getting your money back. There are scores of items which go to make up the cost of manufacture and they are ignorant, but they do not consider them.

Mr. W. H. Hoagland: I do not want to be understood as invoicing brick at the market price. I am opposed to that. I have started out, as I stated in the paper, with the manufacturing department, charging the brick to the sales department at a certain figure, which I think will cover all the cost of manufacture, including repairs and depreciation of the plant. They may show a slight surplus, but it may be taken up the next month—a crown falling in—and if it tallies at the end of the year exactly we have the correct cost of manufacture. If it is over the next year, we can reduce the price to the selling department; if it is below, we can raise the price to the selling department.

Mr. Eudaly: It has been stated, during the reading of the paper, that the figures in the chart are fictitious. I think if the chart is published it should be stated that the figures are fictitious. Can we have it so without a motion?

The President: The Secretary will see that such an explanation is made. We will now take up the next paper, "Brickmaking in the Far Northwest," by Mr. Walter S. Bowen, Little Falls, Washington. I will ask Vice-President Morse to take the chair and preside the remainder of this session.

The Secretary: Mr. Bowen is a long way off, but he intended to be here, but at the last moment was unable to come. However, he has done the next best thing—sent his paper.

#### BRICKMAKING IN THE FAR NORTHWEST.

Mr. President and Gentlemen of the Convention:

On the 10th day of October, 1883, accompanied by wife and baby boy, the writer arrived at the "City of Destiny," the western terminus of the Northern Pacific Railroad, then but a struggling village of cheap wooden buildings, claiming thirty-five hundred inhabitants. There were at this time but two completed brick buildings in the city.

When we think of the wild, woolly western appearance of the village then, and contrast it with the miles of broad, well paved streets and the rows of modern six and eight-story brick blocks, some of them of latest fire-proof construction, and the broad streets and avenues reaching out for miles, lined on each side with elegant residences and beautiful lawns, and each lawn a perpetual flower garden, then add a splendid electric and cable street car service, and the entire city well lighted with both gas and electricity, with a present population of nearly sixty thousand (for such is the present city of Tacoma), it seems like the story of Aladdin's lamp. But in trying to describe our beautiful city, I had almost lost sight of brickmaking.

Soon after our arrival in Tacoma, I was introduced to a gentleman from Missouri, who had been a contractor and claimed to be a brickmaker. Not having had any experience in brickmaking, and common brick building readily ten dollars per thousand, while they were hardly worth five in Ohio when I left home, you can readily see that it was



an easy matter to convince me that brickmaking was a sure winner. Unfortunately, I had a little ready money, and for fear the opportunity might be lost, put it all in. Four of us, one of whom furnished the land including the clay deposits, two of us put up cash, and the gentleman from Missouri promised to put up his share later on when he sold some property he held in Missouri, formed a company under the territorial laws.

After completion of our organization, the gentleman from Missouri, having been duly elected manager of our company, was authorized to go East and purchase such machinery as he might think best to equip our plant, and after being quite liberal in his outlay for crusher, pugger and brick machine, he thought it necessary to economize when it came to providing engine and boiler, with the usual result. After the machinery came and we had partially recovered from the severe shock caused by the enormous freight bill that was presented, our manager came to me and said: "I have just taken an order for four hundred thousand brick at ten dollars per thousand, and believe I can sell a million at that figure." We suggested that it would be better to wait until the plant was in operation and brick were being turned out before taking more orders, but his enthusiasm was boundless, and he contracted three hundred and fifty thousand more, and, there not being any brick made, we positively forbade his taking any more contracts until we had at least one kiln completed.

About the first of May he began to make brick. He had figured on making forty thousand per day of ten hours (that being what the manufacturers of the machines told him they would produce). We, being blissfully ignorant of the experimental stages necessary to the successful production of all clay products, it was very difficult for our manager to explain to us the reason that at the end of thirty days he had less than three hundred thousand brick on the yard, and upon examination we found a large per cent of these so badly checked that they were unfit to set in the kiln.

After finally getting a kiln of three hundred thousand dried and set, our manager said as he had not had a great experience in the actual burning of brick, and as a gentleman from British Columbia who had twenty years' experience burning brick would come and superintend the burning for us—for one hundred and fifty dollars a month—he thought best to secure his services, as the parties to whom we had sold were getting anxious for the brick.

The gentleman from British Columbia came. He found a great deal of fault with the way the brick were set, and the wood, and required a great deal of help, but finally the kiln was burned, cooled and opened. There were not fifty thousand good hard burned brick in the entire kiln. In the meantime the demand for brick had been growing, and so anxious were the buyers for brick, that we were enabled to work off about two hundred and twenty-five thousand of those brick at \$7.50 per thousand.

By the middle of July, our manager having succeeded, by working eleven hours per day in working up the daily average to nearly fifteen thousand, we had quite a large kiln, some seven hundred thousand, ready to fire, and after it had been explained to us that the most experienced burner would occasionally make a mistake in burning a new clay, and being assured by the gentleman from British Columbia that he now felt fully acquainted with the peculiarities of our clay, and that he had found that fir wood, cut green and well seasoned, was really very good for burning brick, and that he felt no hesitation in guaranteeing us a good burn on this second kiln, he sailed in, with result no better than before. When this kiln was opened, and we saw the enormous mass of salmon brick (our customers wanted strictly number one hard, and wanted them quick), you can imagine our feelings. Well, we did the only thing we could; just went right out and bought enough brick to meet our contracts.

When we took stock at the end of the season, we found that we had lost about one-third of our little capital, and about that time our manager informed us that his property had been sold by the sheriff, and the proceeds applied on payment of notes he had given before coming West, and which he had neglected to tell us about, and that consequently he would not be able to pay up for his share of the stock.

Something had to be done, and as the demand for brick continued good, notwithstanding the fact that I would have it all to learn, my associates insisted that I should take the management of the plant. What a wise provision of Providence that we are not permitted to look into the future; for had I realized the difficulties and disappointments that were to be my lot, I should never have had the courage to undertake brickmaking under the then existing conditions.

Our plant was situated on an island, about sixteen miles from Tacoma. One of the first things necessary was a good, substantial wharf; this my predecessor had neglected, and as a result the wind and high tides in the winter of 1884 and '85 had about ruined our drying yard, and threatened to wash out the foundations of our machinery; so we built the wharf.

We started making brick about the 20th of April, 1885, and soon found that our power was insufficient, bought a larger engine, added another boiler, and succeeded in getting out about thirty thousand per day of ten hours. Our first kiln was an improvement on the burns of the previous season, but far from satisfactory, but by close application and a determination to succeed, we finally secured good average brick, and were very much encouraged.

Things went well during June and July; we were making brick by the stiff mud process, using a disintegrator, pugger and double plunger brick machine, setting brick from the machine in loose hacks on the yard to dry.

Our chief difficulty was to get the brick dry in August. We had over four hundred thousand on the yard at one time, and the humidity of the atmosphere and lack of wind throughout the day, and the moisture reabsorbed from the dews and fogs at night, seemed to make it impossible to get them dry. We then began to realize what experience confirmed later on, that to make brick profitably in this climate, it is absolutely necessary to have tunnel dryers, with their equipment of tracks and cars, that all tunnels and kilns must be covered with good permanent roof, also that clay and fuel must be provided in summer in sufficient quantities to last throughout the year, and that it is necessary to shelter both the clay and fuel with good roof. The lack of this knowledge has cost a great many persons dearly. I call to mind a case that was only one of a great number that have had a like experience making brick in the far Northwest.

A gentleman past middle age, who had been a successful contractor and builder in Michigan, came to Tacoma in the early spring of 1887, and after looking over the field for business in his line, like many others came to the conclusion that nine and ten dollars per thousand for common building brick was too much; that the profits of the brickmaker must be enormous, and he came to me and asked my advice in regard to his undertaking to make at least enough brick to supply the buildings he might secure contracts to build. By way of answer I simply told him of our experience, and dwelt at some length upon the climatic conditions here being so very different from those of his native state, that he could in no case count on more than ninety days good brick weather in the season here, and many seasons not more than sixty; that owing to the excessive rainfall in winter one could not provide either clay or wood in proper condition

for use, to say nothing of the utter impossibility of drying the brick. Happening to meet him a year later, he said, "It has just cost me fourteen thousand dollars to find out that every word you said to me was true. I thought at the time you were interested in trying to prevent me from going into brickmaking."

I think, for reasons above given, there have been more failures in brickmaking in this section than anywhere on this continent, and there has been a less percentage of persons successful in brickmaking than in any line of which I have any knowledge. However, those who have weathered the storm and adapted themselves and their equipments to the conditions, have, we think, a bright future, for while the demand has been very light during the late depression, the changed conditions of our entire country, and of the Northwest in particular, will, we believe, cause a more reliable and steady demand for all clay products in the future. [Applause.]

Vice-President Morse: Gentlemen, you have heard this paper read. If any member desires to discuss it we will be pleased to hear from him.

Mr. D. V. Purington: I have a telegram here that I have written and signed the Secretary's name to, and ask the authority of this Convention to send it, after it has been read.

"Capt. S. P. Crafts, New Haven, Conn.—The Convention misses your genial presence, your wise words and sharp criticisms. It has voted to forgive you for not being here this time, but protests against a continuance of the habit." [Applause.]



W. S. BOWEN, Tacoma, Wash.

I move, sir, that the Secretary be instructed to send the telegram.

Carried.

#### PROPOSED REVISION OF BY-LAWS.

Mr. Bloomfield, New York: As it seems to be in order to extend a little courtesy, I have a resolution here which I would like to offer, which has been thought of and talked over by a number of the members:

Resolved, That a committee of three be appointed to make such changes in the Constitution and By-laws of this Association as may be deemed necessary for the best interests of the Association, and submit the same to the Executive Committee, they to report at the next Convention and their report shall take precedence of all other business after the opening of said Convention, and be acted on at once.

Vice-President Morse: Gentlemen, I think this goes to the Committee on Resolutions without any motion.

Mr. D. V. Purington: I make the suggestion that Mr. Bloomfield be added to the Committee on Resolutions, which will give him an opportunity to present his case to that committee and



get them to report on the resolution. I am inclined to think that under the resolution adopted at the first session of this Convention that is the proper course. There was a motion passed on the first day referring all matters pertaining to legislation to the Executive Committee, and it may be that is the proper place for this resolution.

Mr. Bloomfield: This is a resolution pertaining to the changing of the Constitution and By-laws. This does not pertain to legislation, but to the changing of the Constitution and By-laws. It is provided that it shall be referred to the Executive Committee, to report to this Convention next year. They have an entire year to act upon it. They may see fit not to report it.

Vice-President Morse: What is your pleasure concerning this matter?

Mr. D. V. Purington: I ask the Secretary if in our Constitution and By-laws there is any provision for its amendment?

The Secretary: The last article of the Constitution reads:

"This Constitution may be altered or amended by a two-thirds vote of the members present at any annual meeting."

Gentlemen, I think Mr. Bloomfield is acting advisedly in referring this matter to the Executive Committee. He does not want any hasty action at a time when we are anxious to get to other things.

Mr. Endaly: That was the purpose of the resolution passed at the first session. Heretofore we have had legislation and matters pertaining to our Constitution and By-Laws hurried through at the last minute, and it was with a view of avoiding that that it was voted to have these matters go to the Executive Committee.

Mr. Bloomfield: The resolution requests that the matter be referred to the Executive Committee.

Mr. Bloomfield's resolution was unanimously adopted.

Vice-President Morse: How is it your pleasure to have the committee appointed?

Mr. Bloomfield: By the Chair.

Vice-President Morse: I will appoint that committee later. Now, gentlemen, we get down to the questions for general discussion. The Secretary informs me that we have not taken up the questions assigned for yesterday afternoon. Shall we go back and take up the questions assigned for yesterday afternoon, commencing with No. 15, or shall we proceed with the programme as laid out for this morning's session?

#### SOCIAL AMENITIES.

Mr. Albertson: Mr. President and Gentlemen—I wish to announce on behalf of the local committee that we have arranged for a nice excursion up the Monongahela River. We will first proceed to the Davis Island Dam, and then up the Monongahela River past that noted place—Homestead. We will provide you with lunch and dinner and bring you down the valley and show you our mills in the evening after dark. We would like to have as many as possible stay over to partake of this trip. We will start to-morrow morning at half-past ten o'clock.

Mr. Ittner: What time do you expect to return?

Mr. Albertson: Just shortly after dusk—in time for the evening trains.

Mr. Endaly: I will throw out something as a suggestion, not that I am advocating the idea. I know that quite a large number of the delegates have gone off on little trips, visiting brick-yards, etc. It is to be hoped that they will be here this afternoon. It is now half-past twelve. It might possibly be wise to adjourn now and have an early session this afternoon.

The Secretary: I will suggest that, as we usually get such a late start, if the gentlemen are willing it will be best to go ahead and dispose of these questions now.

Mr. Ittner: I will suggest that the small number we have here now evidences that they are earnestly interested in our proceedings, and that we may make more progress now in a half hour than in two hours this afternoon. I move that we proceed to consider Question 15.

Vice-President Morse: Unless objection is made, we will proceed to consider Question 15:

#### "IS DRYING UP-DRAFT IN A DOWN-DRAFT KILN AN ECONOMY?"

Mr. Ittner: I do not know whether many others are situated as I am situated—of course, I have no particular interest in the question—but I have done these two things, and I want to say, briefly, that we have a kiln which is both up and down-draft, and we can dry them either way, and in drying them in these kilns by an up-draft the pipe that we required was more elaborate to place. We had to take the heat from three sixteen-inch pipes that I said ran across the kilns from one end to the other, across the eight kilns, and we had to draw that down out of the pipes and have another pipe running along in front of our furnace and connect those pipes with the furnace in that way, and these were just temporary and were taken away after we dried off a kiln and were laid aside. We found out after trying the drying off of soft clays—previous to that I was an advocate of drying off with up-draft, wishing to get the bottom bricks dry first, so that they would not be damaged as much as they would be with drying up with the down-draft, because they would be the last dried and would have the entire weight on them and be indented much more; but I found out, when I got to operating with patent kilns, set thirty-four high, it was different in setting forty-two high, and either way we got the same results and about the same cost. The cost was not sufficient in its difference to make it an object. As it was much easier for us to connect the pipes above, where we had the connection already, and leave the heat in above and dry by the down-draft, we have done our drying for the last four years by the down-draft. It is much more convenient and it is as satisfactory, and I think as cheap as drying off with the up-draft; but, of course, in drying off in our old-style kilns, with the open top, we could not dry off in any other way than with the up-draft process.

Mr. T. W. Carmichael: In our experience we have tried drying press brick and dry clay brick in a dryer first, and set them in a kiln. And now we find it unprofitable to dry our clay without drying it first in the dryer, because we have very tender clay, and the time consumed in drying that clay successfully would be very great; while, on the other hand, if we set our brick in a dryer and dry them first and put them in a kiln and watersmoke them with down-draft, we get very successful results. We get good brick clear to the bottom of the kiln by drying them on the down-draft principle; and I would not entertain the idea of using an up-draft watersmoking in our present process. We do the work so successfully with the down-draft that we never think of such a matter any more as drying with an up-draft. We used to think about drying up-draft before putting them in the dryer, but we do not care for any change now.

Mr. Pike: My experience is, it is much more economical to dry in down-draft kilns with the use of a stack, because you have the draft of the stack at all times, while perhaps you have not with the up-draft system of drying, which is done by taking the crown-holes off the thimbles from the crown of the kilns, and you do not have the draft to take off the moisture from the brick that you have in the stack. With the stack and large opening you take it off more rapidly and more economically, and with less fuel.

Mr. J. W. Carson: I wish merely to remark on this question that I thought we could not dry with down-draft, and I put a system of up-draft on the kiln, and we had a perfect success.

Mr. Endaly: Like Mr. Ittner, I believe that where you are burning a kind of clay that the brick must be thoroughly dried and carefully dried before you begin to raise the heat in the kiln, it makes very little difference which way you dry, so that you get the brick thoroughly dried, except this, that I am strongly of the opinion that the brick ought to be dried from the direction you expect to burn them. I believe that is the correct way. If you expect to burn them down-draft, they should be dried down-draft; if you expect to burn them up-draft, they should be dried or watersmoked up-draft. With other kinds of clays and bricks, and many of the paving bricks, and other



kinds of ware, where your clays will stand the following of the watersmoking rapidly with the heat—I presume you get my idea; that is to say, where you can have a portion of the kiln quite ready for heating before every portion of the watersmoking is entirely off—following the watersmoking rapidly with the heating, you cannot reverse the drying—you cannot watersmoke one way and burn the other. You cannot watersmoke a down-draft kiln up-draft and get the bottom of the kiln quite hot before the top is thoroughly dry, and then turn heat into the top and drive out below, because you drive the moisture into the wares below. You spoil them, and whitewash them, and do a great deal of damage. If you are going to get the kiln thoroughly dry before raising the heat, you can do it, but it does not pay. The most profitable way to burn brick is to burn them the way you watersmoke them.

Mr. Ittner: It may be that Mr. Eudaly's remarks will necessitate my saying something further. I have stated already that we have dried them both ways—by the up-draft and down-draft methods—and that we do not see any particular difference in either way of drying them. The drying off with down-draft is more convenient, because we do not have to arrange certain pipes that I mentioned, and as drying with down-draft is more convenient, and we get as good results, we do it that way constantly. What I wanted to say was this—that while we dry them altogether by the down-draft method, we burn them by the up-draft method. We burn on the down-draft until we think our clay is a little more than half-burned, settling of six or seven inches on the down-draft, and then we entirely reverse the draft in our kiln to the up-draft, and finish our burning on the up-draft principle. So far as any difference in our wares is concerned, with reference to checking or flashing or anything of that kind, we have not noticed it. We get as good results one way as the other, and I differ from Mr. Eudaly in this respect—that a kiln should be burned by the draft in which it is dried off. If we dry off our kiln by the up-draft and burn by the down-draft, or vice versa, we get as good results in burning and drying off as we would if we followed the same method in each case.

#### COMMITTEE ON REVISION OF BY-LAWS.

Vice-President Morse: Before proceeding to the next question, I will announce the Committee on the Revision of the Constitution and By-Laws. I have selected this committee from the East, not because I am an Eastern man, but because I thought it would be easier for them to confer together if the nature of the business demanded. I appoint this committee as follows: Charles A. Bloomfield, of New York, Chairman; George M. Fiske, of Boston, and C. H. Classen, of Baltimore. We will take up Question 16:

#### "DOES IT PAY TO COVER THE TOP OF AN UP-DRAFT KILN WITH EARTH?"

Mr. Ittner: I tried that once, with a single kiln, and did it, of course, after the suggestion of Mr. J. W. Crary, who had a great deal to say on that subject in his different treatises on brick and in his articles on clay work; and in the kiln which I covered with clay I found my wares were benefited. They had a clearer ring; but, while that was the case, it could not be applied as I applied it in the busy season, because for about two weeks after my kiln was closed up I think it was about as hot as it was when we first ceased burning, so that in that method there would be too much time lost. But the time we did it we put two inches of fine clay over the top of the kiln, and I did not do that until I had the fires all through and the kiln was nearly finished burning. The kiln was platted before we commenced to dry off. There was no extra platting, more than this two-inch coating of damp clay, put over the top after the fires were fully through, and perhaps eighteen or twenty-four hours before we finished burning. I am positive that it helped the wares and annealed the brick, and kept the heat confined, and by the confining of that heat the brick were annealed. The brick of that kiln seemed to have a better ring and a better color than any others, but that was the only kiln I tried.

Mr. J. C. Adams, Indianapolis: I am glad to hear an expres-

sion on this subject. The experience I have undergone with more or less of benefit, and I have always found it a benefit to cover an open-draft top kiln in the fall or winter season, to prevent the cold drafts coming down, convinces me it is a good thing. I have always found it a benefit in giving me a larger percentage of hard, well-burned brick—with the further experience that has come to me, that our salmon brick burned on the tops of kilns so covered have a better ring and are sounder. I have used earth, coke and coal slag, and asbestos, with more or less success. The disadvantage of the system lies in the fact that when the material becomes burned it gets thin and runs down through the kilns, and to a considerable extent discolours the brick, and makes them a dirty color. I should like to hear the experience of some other of our friends, if they have had any. I have tried sheet-iron, but when you are in a section where the clay shrinks ten or twelve inches, and the clay goes down, the sheet-iron is of no use. Asbestos does very well, but the wind comes up and blows the asbestos in every direction and away goes the brickyard.

Mr. T. W. Carmichael: I have had some experience in this line. In my case I took the ground clay from the mill and put it in a mortar-box and made mortar or daub of it. The mortar



GEO. H. ALBERTSON, Pittsburgh.

or daub was in such condition that you could work it with a hoe. I spread it over the plat after the fires were well up, and scraped it close on the brick until the cracks were tight with this daub. The results were, the brick were burned hard, clean, and with an elegant ring clear up close to the plat. In this case we did not have two inches to go down through for brick. You have the clay there, which hardens on the plat and your brick, and as far as shutting off the draft goes, it is a perfect success. You shut off the draft entirely where you do not want it, and it is crowded out where you need it. In my experience I think the use of mortar or daub with a hoe is much better. The settle I refer to was as level as this floor, and although the result is very good, I think in closed kilns if I had kept on with the process I would have had better results. The brick were as pretty as any burned in a down-draft.

Mr. D. V. Purington: I want to call the attention of this Convention once more to the point that I raised yesterday; that is, in the discussions of these questions, the discussion shall be



confined to the questions asked. Up to this point there has not been a single word said relating to the subject: Does it pay? I say that in our business it pays, and the only time we do not round the kilns—which is a term well known to brickmakers—is when we are rushed; but it is always done when we have time to do it. There are times when we are in such a hurry that we do not do it. But that it pays to do it, on all up-draft kilns, there is in my mind no question whatever.

Mr. J. F. Smith, Omaha: I am at home when it comes to open-top draft kilns; but in West we have different ways of thinking, and some people out there, when the brick commences to settle—

Vice-President Morse: The gentleman will confine his remarks to the question—Does it pay?

Mr. Adams: I rise in order to make an explanation. The gentleman is setting forth his premises and giving his experience, so as to set forth a conclusion as to whether it does pay.

Mr. J. F. Smith: There is no doubt in my mind it is a good thing to cover the kiln with dirt at the proper time—but, does it pay? I do not think it pays to put it there. It is too expensive to put it there. That has been my experience.

Mr. Ittner: I take exception to what Mr. Purington said with reference to no speaker having dwelt on the subject as to whether it paid or not. I supposed that he, at least, was enabled to infer by my remarks that, while I did not use the word "pay" in the remarks I made, I said that in busy seasons we could not—while it improved our wares—afford to waste two weeks' time to obtain these results, and hence that would imply that it did not pay. As Mr. Smith, of Omaha, has properly remarked, it costs money to get your clay up there and remove it after the kiln is cooled, and hence that would be an expense. Now, then, Mr. Purington speaks from another standpoint than my own. If I was manufacturing the character of clay that Mr. Purington is making, and if it cost me one month's time, I would employ that method. I think he had reference to his street-paving brick when he answered the question.

Mr. D. V. Purington: Not at all; we do not use up-draft kilns there.

Mr. Ittner: I do not believe that Mr. Purington—judging him from his nature and disposition—would wait two weeks for a kiln to gain certain advantages and certain conditions in the manufacture of his brick.

Mr. Bradshaw: I find, on account of discoloring and handling, and extra cost of getting the clay on top of the kiln, that it has not paid me to use this method.

Mr. Purington: I move that no member be allowed to speak more than once on the same question.

Vice-President Morse: The Chair will endeavor to enforce the rule, without putting the motion to vote. We will now take up Question 17:

#### "HOW ARE ORNAMENTAL BRICK GENERALLY BURNED IN AN ORDINARY DRY-PRESS YARD?"

Mr. J. W. Carson: I think that it is better to burn ornamental brick in an ordinary yard in the kiln with the ordinary run of bricks. I think so for this reason—in an ordinary dry-press yard you have different shapes of bricks, and you must have ornamental brick to run into that color. If you burn your ornamental brick in a special kiln—the special kiln has qualifications for burning everything alike—you get all No. 8 or No. 10. I have made it my practice always to burn ornamental brick generally in the kiln that we burn our ordinary brick in, and we set some up, some in the center, and some lower down, and in that way we get ornamental brick that runs in the color of common brick, and saves the expense of special kilns.

Vice-President Morse: Question No. 18 is the next subject for general discussion:

#### "IS AIR PRESSURE AS GOOD AS STEAM IN THE USE OF OIL FOR BURNING BRICK?"

Mr. D. V. Purington: I suppose I ought to be able to answer the question, but it is not settled. The general theory in regard

to that is that in burning with steam a large amount of steam is taken into the kiln, which in burning with air is not taken in. The air is preferable to the steam. We are using it both ways in our Chicago plant, and with results in favor of the air, so far as dollars and cents go, and as far as results go.

Mr. W. S. Purington: We have tried three different plans at Galesburg, using high-pressure steam, high-pressure air, and low-pressure air; steam at ninety pounds, six or eight pounds of air pressure, high-pressure; and eight ounces of air pressure, low pressure. While we have saved something in the consumption of steam by running steam, the results and amount of oil used is practically the same in each case.

Mr. James Taylor, Port Monmouth, N. J.: I have never used oil and steam, but I have visited a number of factories where they did use the combination. I would have been ashamed to see my factory looking as dirty as the best factory I have ever seen running steam and oil. With the eight-pound air-pressure no one could tell but what we were using gas. I think that way is the best.

Prof. Edward Orton, Jr., Columbus, O.: I have used air-pressure at fifteen pounds and steam at ninety pounds at the boiler—I do not know what it was at the burner, after a long travel through the pipes. I have had an opportunity to compare the two carefully. I have never burned low-pressure air. The air pressure was unquestionably the more advantageous, if you are going to use high-pressure air or high-pressure steam; but it is specially advantageous on account of this reason: In the early stages of the burning it is a detriment to put in excessive watery vapor into the gases which come into the kiln, for the reason that the upper courses of the kiln intercept the largest part of the heat traveling in, and the lower courses are not warmed to a great extent, and if the gases traveling into the kiln contain much moisture, that is almost certain to be precipitated to the bottom, and it goes to the lowest courses. This deposits a watery vapor on the surface of the brick, which has many deleterious consequences. In the case of using steam, that cuts a different figure in the first stage of the burning. If the temperature of the kiln gets above the boiling point, the bottom course has no further wetting. As far as the economy of transmission is concerned, the air pressure has the advantage again. I think, of the two, the air has a distinct advantage.

Mr. Eudaly: My judgment is, for a small or light fire, not a hot fire, the air is undoubtedly a great deal better. In fact, I will say that I believe in the air all the way through; but I do not believe, for a hot fire, that anyone can tell any difference, so far as the vapor is concerned. You cannot find any vapor settling anywhere on the kiln if you introduce steam into a hot furnace. For low fires, and beginning with a burning kiln of brick from start to finish, the air is the best.

Mr. J. C. Adams, Indianapolis: Is it not a fact that the use of steam in burning with oil is likely to stick the brick?

Mr. Eudaly: I have never seen it done. I do not think it would do it any more than with the use of air. If you let steam go into a kiln at a sufficiently cool temperature, so as to make water form on the brick, you are certainly not raising any heat in the kiln; and whenever you increase the heat to get heat sufficient to burn the brick, you haven't any steam to stick around.

Mr. J. Parker Fiske, Boston: Does it make any difference in the resulting color of the brick whether you use steam or air?

Mr. D. V. Purington: None whatever.

Mr. E. L. Cook, State Farm, Mass.: Does the steam, in entering with the oil, with the kiln brought up to a high degree of heat, condense and form any gas, such as water-gas? Is anything added to the value of the fire?

Prof. Edward Orton: I think that it does not. If it forms a gas at one moment, and thereby consumes a part of the heat in being broken up, the gases which are formed by the process are combustible, and a moment later, when they get an excess of oxygen, they will burn. They borrow heat at one moment, and pay it back a few moments later.

Vice-President Morse: We will take up Question 19:



"HOW CAN FINGER-MARKS ON FACE BRICK BE AVOIDED?"

Mr. Eudaly: I think one way to do it is to use a paddle of some sort for handling brick. I have tried to avoid these marks over and over again, and believe that is the only way to do it. You might say, "Wash your hands," but that does not cut any figure.

Mr. J. H. Chambers, Philadelphia: Some men will handle a piece of finished machinery, and cannot fail to make a deposit that causes a rust. Another man will handle the same piece of machinery and not show any effect upon it. It depends on the individual a little—the composition of his blood.

Mr. W. H. Hoagland: We had an experience of this kind about a year ago. We had many finger-marks on a certain kiln, and we bought some rubber finger-stalls for the men, and the finger-marks did not appear on the next kiln. I am unable to say whether the finger-stalls prevented the marks, or whether there were other conditions which prevented them.

Mr. Ittner: Have you continued the finger-stalls?

Mr. Hoagland: No; they wear out quickly.

Mr. Pike: Woollen mittens are better than finger-stalls, but they also wear out quickly.

The President: Question 20 is next:

"IS THE STANDARD SIZE OF COMMON AND FACE BRICK ADOPTED BY THE N. B. M. A. GENERALLY ADHERED TO? IF NOT, WHAT FURTHER CAN OUR ASSOCIATION DO TO MAINTAIN THE STANDARD?"

Mr. Carmichael: We aim to make our brick standard size, according to the standard laid down by the Association. We ship the building brick East, and we find there our brick in competition with a smaller brick than ours, and our experience is that in some places in the East the standard size is not adhered to.

Mr. Ittner: I think we should devote a little time to this subject. My desire and my wish is that eventually we all conform to the standard size of brick. We are talking now about building brick in general, both press and common. Our Association some four or five years ago established a standard size for both press and common brick, and that size was endorsed, not only by the National Association of Builders, but by the American Institute of Architects; so that there are three national bodies, all connected with the building business of this country, that have endorsed a certain size of brick. Now, if I were called upon to name that size, I do not know that I could do it to a fraction; but I am glad to inform the gentlemen of this Association that in the city from which I come—St. Louis—we all endeavored to conform to that size. Sometimes, perhaps, our brick for the moment will run a shade thinner, while at other times they may run a shade thicker. I presume that will happen with almost anyone; but anyhow, we have maintained the standard size—I think the standard size is  $2\frac{1}{4} \times 4\frac{1}{8} \times 8\frac{1}{4}$  inches. The standard-size press brick is the same, with the exception that it is one-eighth inch thicker. These are the standard sizes as established for building brick in this country by this Association. I think it behooves us as an Association, especially since that size has been endorsed by two other national bodies, to adhere to that size.

Mr. J. C. Adams, Indianapolis: In answer to the question I will say that it is not lived up to. Why? For the reason that you cannot do it. The National Association agreed upon the size of brick. The report of the committee was concurred in. I made my molds to conform to that size. I made a brick which was burned  $2\frac{1}{4}$  inches thick, and one of my competitors took my brick, with one of his, which was  $2\frac{1}{2}$  inches thick, and carried it around with him in a buggy. He would show it to his customers and say, "This is the kind of a wafer that Adams makes, and this is the kind of brick I make." The question is one that we have tried to control, and endeavored to have some united action upon it, but it is utterly useless, and is entirely of that character known as a "local question."

Mr. W. A. Eudaly, Cincinnati: I did not expect to say a word on this question. I was chairman of the committee that had this question of standard-size brick before it for two years, and it was adopted, and some of you may remember when it was finally adopted, and it was then stated that it could not in all probability be effective—that we knew quite well it could not be enforced in every locality, possibly not absolutely in any one locality; but here we are, representing a great manufacturing industry, scattered all over this country, and it was thought advisable that we should have some standard for the materials we are manufacturing. This question of the size of brick is likely to come into the courts. The question of what a standard-size brick is may come to some of you gentlemen forcibly before another year. It is well for us to have laid down a fixed and standard size for the materials we are manufacturing; and it was upon that line that the committee and Convention proceeded at the time the standard size was adopted.

Mr. J. F. Smith, Omaha: Soon after the National Association adopted this standard size, the brickmakers of Omaha got together, and we all made the brick of standard size, except one man, and he did all the business; and I understand that the



CHAS. BRAY, Helena, Mont.

same man went to St. Louis and put up a large building there, and he went and contracted for a special brick for that building.

Mr. Ittner: It was not made in St. Louis.

Mr. Smith: He got the brick in there. We then got the City Council of Omaha to adopt an ordinance specifying the standard size of building brick. We also took the matter to the Legislature, and we have a law in our State regulating the standard size of brick. It has not been enforced; and at the last State Association meeting the thing was talked of considerably, and we were thinking of making a thicker brick. We thought we had better make it  $2\frac{1}{2}$  inches thick.

Mr. J. E. Clapp: We have had the same experience that Mr. Smith has had. One of the largest brick manufacturers in Michigan runs his brick  $2\frac{5}{8}$ , and an extensive manufacturer in Ohio makes his brick  $2\frac{5}{8}$  inches; so that any competition has to be made on the price, or we will lose the job.

Mr. James Taylor: We have acknowledged that the standard size is not universally lived up to. One way to reach this mat-



ter is for our local Associations to fix the standard size. The way this question was settled in England, something over fifty years ago, perhaps may be of interest to the Association, and help to solve the difficulty and get rid of such men as the one who interfered with Brother Adams. They fixed the size of brick, and every brick that did not conform to that size paid a tax. A brickmaker could make them any size he liked, but if a brickmaker did not make them of a standard size he paid a fine.

Mr. George M. Fiske, Boston: To my mind we never can accomplish anything whatever in this direction unless the architects can be induced to take it up. If they would take up the question and adopt in their National Association a certain size of brick, and demand it, we might accomplish something. The Association might pass such a rule, but unless the architects demanded its enforcement in their individual business transactions, nothing can be accomplished. In our market we are selling bricks from Virginia, Maryland, West Virginia, Ohio, New York and New Jersey, and they vary from  $7\frac{1}{8} \times 2\frac{1}{4}$  to  $9 \times 2\frac{1}{2}$  inches.

Vice-President Morse: We will now proceed to the last question on the present list, No. 21:

**"WHAT IS THE BEST METAL FOR MAKING DIES FOR ORNAMENTAL BRICK?"**

Mr. J. W. Carson, LaPrairie, Quebec: In the case of dry-pressed brick, I would recommend and use an ordinary soft cast-iron die.

On motion, adjourned.

#### FIFTH SESSION.

Pittsburg, February 17.

President Flinn called the meeting to order at 2:55 o'clock, and announced the first business of the afternoon session to be the reading of the paper on "Manufacture and Use of Press Brick in the South," by Lee Dunn, Lake Charles, La.

The Secretary read the paper, as follows:

#### MANUFACTURE AND USE OF PRESS BRICK IN THE SOUTH.

Mr. President and Gentlemen of the Convention:

The subject assigned me is one that I would like very much to devote some time to and put before you for discussion. But I have been in very poor health for weeks past and am still confined to my room, and will have to ask to be excused this time.

The manufacture of dry press brick in the extreme South, I am sorry to say, is in its infancy as yet, and it is a great pity. There are large quantities of very fine red clay and shale and fire clay that would be worth fortunes in some places, but the people are slow and allow a most miserable common brick to be imposed upon them. Many people are led to believe that they can't build a wall or chimney with dry press brick; they must have that common checked brick; show them a pretty face brick and they say, that will do for an ornament or mantel, but it will not hold mortar, etc.

I have offered the beautiful dry press brick worth \$18.00 per M. for \$6.00 and \$7.00 per M.; they could not get common brick for less, but said they could not use my brick. I had my brick tested at Washington, D. C., and Watertown, Mass., and they stood 300,000 pounds pressure. They say dry press brick will not hold mortar; they can't handle them, etc.

We put up the beautiful Sophia Newcomb buildings, the McDonough School buildings and some others in New Orleans, but such contracts were few and far between, hence the plant at Stonington, Miss., in which we put about \$90,000, has about gone to wreck.

It hurts me to see such large, beautiful buildings being put up with cheap common brick, pillars and chimneys and some entire brick buildings without a good brick in the building. A well made stiff or soft mud brick will do for foundation work, but when you can put up pillars, chimneys, fronts, etc., with beautiful face brick and for almost the same money, why spoil the building, detract from the appearance of the whole neighborhood and city by putting in old checked up, rough and all colored brick? I say, I have been very much disgusted, but not entirely discouraged. I hope yet to be able to introduce a first class brick in these districts. I have thrown away a better brick than these people here pay \$7.00 and \$8.00 per M. for.

Regretting very much my inability to be with you, I am,

Very respectfully,

LEE DUNN.

Mr. Ittner: I would like to say a few words on the paper just read. It was very short, and I do not know whether I grasped its meaning clearly or not. I think the subject relates to the dry-press process, but it did not say so in the paper. It says press brick. That does not mean, necessarily, the dry-press process.

The Secretary: The gentleman does make by the dry-press process.

Mr. Ittner: I was surprised when I heard the paper read, because it is not so long since I sent some brick to New Orleans, and I supposed that the freight on the brick was not less than \$12.50 a thousand. I have also shipped brick to Lake Charles, La., and other points in that section. That does not indicate that there is much prejudice against dry-press brick there. The brick was \$10 a thousand on cars at the works, and with the freight at \$12.50 a thousand would make it \$22.50 a thousand, and with \$1.50 a thousand to haul them, would make \$24 a thousand. That was three years ago. Viewing it from that standpoint, it seems there was no prejudice against that system of manufacturing down there at that time. The gentleman speaks about his brick standing a crushing test of three hundred thousand pounds per brick. I presume that the brick I sent would stand one hundred thousand pounds more than that. Still, the bricks he speaks of were amply strong for any building.

Mr. Carmichael: I have had the pleasure of shipping bricks South, where the freight was \$15 a thousand, right down into the heart of the South—Atlanta, Ga., and in the Carolinas. We seem to get a good share of our trade in the South. The trade is in dry-pressed brick, going mostly into the court-houses down there.

Mr. Ittner: Last year I sent over one hundred thousand brick to Atlanta for the St. Paul Sanitarium.

Mr. Carmichael: We have a contract now to deliver three hundred thousand brick in the South.

The President: "Soft Mud Brick," a paper by Mr. Charles H. Merrick, Syracuse, N. Y., is the next topic.

#### SOFT MUD BRICK.

Mr. President and Gentlemen:

Brick, to the careless observer, may not mean very much, but, when considered carefully, it is a very important factor in human progress and happiness.

The most comfortable homes, cool in summer and warm in winter, are built of brick. The generally accepted safe escape for the smoke and flame of the furnace, the heater or the kitchen stove, must be built of burned clay. The great factory, the massive fifteen and twenty-story buildings and the beautiful house contain, in their most important construction, the production of our handiwork. Even the church with its tall spire ever pointing us toward the City not made with hands, and whose streets, it is said, are paved with gold, must in that last great day give praise to the brickyard and its proprietor.

No other material has ever stood against the ravages of time compared to it. The old Roman roads were built of brick and are there to-day. The rains and floods of time have poured down over burned bricks and they still remain. The hottest fires that have ever leaped from building to building have not been able to destroy them, and burned clay stands at this time as the only generally accepted fire-proof material in the world, and the day is not far distant when a wooden building will not be considered safe or economical in any large city or in many small ones.

Solid and hollow clay production is becoming so abundant that it is almost, if not quite, as cheap to build of brick as of wood.

The advanced and perfected methods of manufacture, the vast capital being invested, bringing out the most beautiful effects in terra cotta and brick, have opened up a field for the entire development of the architect's dream and the proprietor's study.

Who shall say, then, that the heart of the clay manufacturer shall not rejoice when he looks back over the past and comes down to the present? What class of goods, what manufactured article has made greater strides? What production has commanded greater attention from master minds? If we were to search the world for an occupation more useful or with greater opportunities, where shall we look?

So when this Convention meets in this great Iron City, it means we have undertaken no idle journey. We have come from the East and from the West, from the North and from the South with one purpose—the elevation of this great business to a higher plane.

We expect to meet each other in debate upon the floor of this Convention; we expect to meet each other in the rotunda and corridor of the hotels and there whisper to each other the secrets of our mystic art, and tell each other how to fill our pockets with the mud of ages, and enjoy for a brief season that sweet communion which only the clayworker knows how to enjoy; and when we shall again turn our faces homeward and shall again sit under our own vine and fig tree, may it be our lot, when we remember this city and this Convention, to feel as did the poet:

"Around my fire an evening group to draw  
And tell of all I felt and all I saw."

But I am down on the program as a champion of the soft mud process.

We were, until recently, manufacturers of that class of goods. We are now, however, working in the stiff clay product and re-press by steam our whole output.

Fortunately for the subject, I have been a soldier, and when the captain assigned me to the stiff mud brigade, I knew that I must obey.

If I were a committee to give new names to the brick-making interests, I would give the soft mud product a higher sounding title, for I believe it takes no back seat among the clay production of the world. It has been said, "What's in a name?" There is more than we realize oftentimes. It may be an attraction and an object lesson to the purchaser.

We once manufactured a brick that we called a Syracuse Croton Front. For several years it had quite a run. An Irish competitor with a creaking voice came into our Builders' Exchange and the boys thought they would have a little fun, so one after another said, "The Syracuse Croton Fronts are going to knock you out." His answer



was, "Perhaps I might sell my stock quicker if I'd call this Piece-dilly brick."

The names soft mud, stiff mud and dry clay do not, we believe, convey to the average consumer the right impression or real quality and intrinsic value, but these names, homely as they are, have come down to us from our fathers and it would be as hard to change them as to change the course of the sun. So we will let them remain and overcome this moss-covered title with the perfection of our beautiful productions.

Who is able to say that the soft mud buffs and reds of the present are not a thing of beauty and a joy forever, worthy of the greatest praise from both competitor and purchaser?

If our grandfathers and fathers could stand to-day and look down the hillside of time and view the improvements that have come in upon us and see the square, smooth, hard productions of the present as they stand out in bold relief from our substantial structures, and then turn and look at the many miles of smooth brick pavements standing the test of wear better than granite itself, what would be their first questions? They would ask, How do you mix your clay? How do you manage to get such color? such beauty? such perfection? And the next question would be, What price do you get? And when told the small prices and the great competition, methinks I see them fly away in disgust to that distant City whose walls are built of jasper and whose streets are not paved with brick. In the second chapter of Genesis we read, "And the Lord God formed man of the dust of the ground," and that first clay product became a thing of life, and the wheels of this great world were set in motion, and man started out on his career of progress, and among his many productions pottery, terra cotta and brick were wrought out, but it has remained for the first manufacturer to produce from moist dust a living form.

Clay in the past has been tempered by the feet of men and women, then by oxen and horses, and some of the bricks made from this clay have stood the storms of ages.

Later came other crude methods, until finally the rough box with knives to mix and small wings to throw out, aided by one horse-power. Then came the two-horse rigs with larger and heavier machines and soak pits. Then there came to the relief of the brick manufacturer the great steam horse; then the employer, the employee and the trade had to hustle or be covered with an avalanche of bricks. The clay was mixed as it had never been before. Then came the crushers, the disintegrators, the pug-mills and mixers. The iron bound mold and the iron machine and perfection more than ever began to perch upon the banner of the brickmaker, until at the present time he is able to mix the clay, free from a single lump.

From our observation and experience we consider the large soak pit good, yet to prepare clay thoroughly and cheaply we believe the crusher or disintegrator, tearing up so fine that no lump can be found, and then thoroughly mixing in a pug or mixer before entering the brick machine, is the best and most economical that can be adopted for the soft mud process. We believe also, where practical, the turning of the clay bank in the fall and winter months is conducive of good results, thus allowing the clay to freeze and thaw and disintegrate, thereby saving power, making better brick and easier handling into cars and carts. We deem it very wise in this class of goods to have them as dry as possible before burning, then burn the first few days with care and not rush. We have found good results from placing fine coal or coke dust among the spaces between the brick on the outsides and heads of up-draft kilns.

And now perhaps it would be unwise to take up more of your time on this subject, and we will close by simply stating that we are proud of the fact that we come from a city where it has been practically demonstrated, through the energy and enterprise of some who are members of your Convention, that it is possible to make a first-class paving brick by the soft mud process, thus proving that soft mud is jogging along at a sure and steady gait side by side with the stiff and dry clay processes. [Applause.]

The President: Does any gentleman desire to discuss this question? The next paper was to have been presented by Mr. Arthur W. Seyall, of Pittsburg, Pa., on "The Advancement of Paving Brick Tests." The Secretary informs me that Mr. Sewall has not prepared himself on this question. Unless some gentleman desires to discuss the question, we will pass it. The next in order will be the report of the Committee on Technical Investigation. As Prof. Orton does not appear to be present, we will pass that question for the present.

Mr. Ittner: I ask if Mr. D. V. or Mr. W. S. Purington is in the room? If so, I would like to hear from them on this subject.

Mr. W. S. Purington, Galesburg, Ill.: I hardly know what to say on this subject, other than that the test that was established by the Commission has been universally adopted, as far as I know, in all of the larger cities. I do not know of anything that has done more good in the paving-brick interests than the report of the Commission.

The President: In the absence of any other gentleman desiring to discuss this question, we will proceed to the consideration of the questions for general discussion omitted from the programme of this morning. The first question to be taken up is No. 25:

**"IS BURNING BRICK WITH PRODUCER GAS A SUCCESS IN EUROPE? IF SO, WHY IS IT NOT INTRODUCED IN THIS COUNTRY?"**

Mr. J. Steele, Pittsburg: I do not know whether the burning of brick with producer gas is a success in Europe or not, but I think that the only reason it is not used here is that the brick-makers do not understand the economy possible with its use. Now, there is no reason why the coal used to burn one open-top kiln should not be sufficient to not only burn but to generate

steam to make and furnish heat to dry enough brick to fill the next kiln. This can be done with the use of gas producers.

Mr. Carson: The reasons why producer-gas has not been more widely adopted in this country are: First, lack of practical knowledge, and, second, the high cost of installation of plant.

Some years ago, at Louisville, I had the honor of reading a paper before the N. B. M. A. on this question, and just to show you the general interest manifested, I state that I received afterwards numerous inquiries as to cost and points of general information, which I answered on honor.

In the discussion that followed the reading of the paper, two points only were prominent: the water-smoking and the tar difficulty.

Neither were fully cleared up, and as I have noticed some attention is being devoted to the first one, especially in the "Clay-Worker" columns, I beg to offer you the benefit of my experience.

I stated in my paper that we found it impracticable to water-smoke with the fuel gas; and as a reason why, I stated that we



C. H. MERRICK, Syracuse, N. Y.

found our brick spotted, both of which statements were correct.

As we were burning only a high grade of buff and colored-face bricks made by the dry-press process, you will readily see the reasonableness of this latter point.

For fire, or common bricks, this trouble would not have had so much, if any, force, but in our case it was fatal.

You will naturally ask why should the gas spot the bricks, and I answer, just because of a lack of knowledge of the proper application. We could only charge it to the particles of tar that floated unconsumed into the kiln, and this hypothesis goes to show that our combustion was imperfect.

We tried various arrangements of furnace, various sizes and positions of air inlets, but we could not entirely overcome the difficulty, so, perforce, we decided it was just as well to dry off with wood. One very important feature of this method of burning was, we had practically no soft bricks.

Now, a word about the tar. Mr. McGraw suggested that



the tar might be collected and sold, bringing in a revenue; and another member whose name unfortunately I forget, came to me in the hotel and, in a button-hole talk, suggested the laying of a wooden, barrel-shaped pipe (in sections) in place of an arched brick affair. When loaded these sections could be taken out and replaced by others; the tar collected and sold. I think the suggestion a good one and worth a trial by any user. This is only one of the many valuable suggestions I had offered, and which I am treasuring up for any future opportunity of trying their value practically.

Theory is a splendid acquisition, and a very valuable companion for practice, but we cannot be sure of our theory until practically demonstrated.

To get the fullest benefit of this fuel, it must be in use generally throughout the works. Under the boilers, under the dryer, on every kiln, and if you have a continuous kiln, so much the better for the economy of the system, but not necessary for its success.

It has been contended that a good grade of coal is necessary, but this is not so. We mined our own coal; it was a thin vein and of poor quality. We had so much difficulty in burning it in our kilns (up-draft, down-draft and continuous), owing to its low-heating and clinkering tendency, that the fuel-gas system was designed to meet our conditions.

We proved this much, that although our system was far from perfect, we could use the inferior coal; we saved coal by the operation; we saved labor in the burning, one man easily taking care of three (3) kilns, and the kilns showed very little wear and tear.

Our greatest trouble came of the tar. It would choke the valves, causing intermittent flooding of the gas as the passage was cleared or obstructed; but taking the system generally, it is worthy of close attention by our large brick industries.

As I remarked in the beginning, it needs only an understanding of the correct principles for its application to make it a favorite (because of its merits) with our large-capacity brick manufacturers, especially of fire and paving bricks.

The President: Question 26:

**"IS IT PRACTICABLE TO MAKE GAS FROM BITUMINOUS SLACK FOR BURNING BRICK?"**

Mr. J. Steele: It is practicable to make gas from bituminous slack to burn brick, but it is cheaper to use a good quality of run-of-mine coal, as the percentage of gas is greater and the waste is less.

The President: Question 27:

**"WHICH IS THE BEST WAY TO SET AND BURN FIRE-FLASHED OR IMPERVIOUS FACE BRICK?"**

On motion, this question was passed.

The Secretary: It occurs to me that possibly it might be in order to pass these questions for the present, as so many gentlemen who would perhaps like to speak upon them are not here. There is a gentleman present by the Secretary's invitation who could perhaps be prevailed upon to say a word or two on a subject in which we are all interested. I refer to Mr. Loring, who is an authority on some branches of fire-proofing.

Mr. James Taylor, Port Monmouth, N. J.: I want to speak to the Convention, if I may for a moment, in regard to this matter. This gentleman, Mr. Loring, came in last evening, and I found that he had been invited by our Secretary to address the meeting. It is the Mr. Loring, of Chicago, whom I told you was one of the firm of Loring & Jenney, the architects, among the first men in this country to take up and make a study of this application of burned clay to the purposes of fire-proofing. I worked with Mr. Loring, shoulder to shoulder, for seven years, from 1870 to 1877. Chicago, we are given to understand, is ambitious to run this Convention, and I propose to have another piece of Chicago brought into this Convention, if the members will accept.

The President: In the absence of any objection, the Chair will call for Mr. Loring.

Mr. Loring: Mr. Chairman and Gentlemen—and brothers in

the clayworking business, I can say. It was my pleasure thirty years ago to begin to invest money in the manufacture of clay. I did it, first, because I was intensely interested in the subject of clayworking, and secondly, I had been harassed and annoyed by the stone-cutters, and meant to get even with them. I think it was after I had been interested in the matter for three or four years that I began to do active business. I then found that, while we were making well-burned work, it was not good work, mechanically speaking. I corresponded with manufacturers in Europe, and the first thing I heard from there was a letter from James Taylor, stating that he was coming to America, and was interested in the subject, and would like to talk with me about it. I found him some months after that on a little fruit farm in New Jersey, and invited him to come to Chicago. He came there as the Superintendent of the Chicago Terra Cotta Works, and from that day we began to make good work. [Applause.] We made sound work before; but I mean good work in the mechanical sense—square work. We began to branch out in the manufacture of clay products. We were told then that we could not make a piece six feet long and have it come out straight; but we did, and even made them nine feet long. At the time of the Chicago fire, or a little before that—I am going to lead up to the fire-proofing part of the trade—I was building, in connection with Robert Lincoln, a block of thirty-two houses, and I heard that a concern in Philadelphia were making chimney flues of fire clay, and they sent two carloads. I found that it was under-dome sewer pipe. I took one of the pieces and tested it, and found that it worked nicely with the hot air, but when the cold air struck it it began to go. My mother told me, many years ago, that if I started on a certain tack, and it was right, I would buck my head through a stone wall to follow it. I felt that I had started on the right tack, and after some months of experiment we made a flue that would stand the fire—it was a mixture of clay and sawdust, and the product is now called terra cotta lumber. We called it porous terra cotta. I thought when I saw the first piece that came out of the kiln that it would not stand frost. The result was that we started a series of experiments, and after three years we tested the product with water, fire and frost, and we found it would stand. Then came, during that interval, the Chicago fire; and when a metallic-frame building that I had constructed I found in a heap in the cellar, instead of standing up in the way I expected to find it—that we had forgotten that metal was not a fire-proof material—that it merely would not burn, but that it would soften and collapse under the action of heat—was a matter that had not been thought of, and with it we did not realize the necessity for protecting it from this action of heat by some non-conducting and fire-resisting material. I started at that time to put up, in rebuilding this building, a skeleton construction, protected by this porous terra cotta; but the skeleton scheme was so novel that my associates laughed at it, and I had to abandon it for a time. It had to be postponed for a few years.

But, to make a long story short, in 1875 we constructed a fire-proof roof, consisting of brick arches and roof-setting of tiles sixteen inches square, three inches thick, and paneled on the under side, and made of porous terra cotta, which we put on the power house of the waterworks of the city of Chicago. The slates were bedded on this surface, and nailed into it, and today the roof is there in all its simplicity and perfection, as it was twenty-five years ago, nearly, when it was first put in place. From that time on the progress of terra cotta work has been rather slow but very sure, and now I think there are more than forty—I do not know but that there are over fifty establishments in the United States, Canada and England manufacturing the material. I was amused when told by the Secretary of your Association that some persons had an impression that I was opposed to clayworkers' products, and I am glad of this opportunity to state that the only position that I have ever taken is that I do not want them to waste their material. I want them to put it where it will do the most good. I want less clay and more brains; that is all. No man in the world has



done more in a small way than I to develop two phases of the clayworker's business. Now, the two great uses of clay are for protection and for decoration. As a decorative material there is nothing so great, nothing so good, in God's universe as clay. For protecting wood against fire, there is nothing so good, nothing that will absolutely stand the test of fire, water and frost, except burned clay. But this I found—that the only reliable fire-proofing material, the only thing that would stand fire and frost, was the porous clay, consisting of about half in volume of air cells and the other half of clay. With little tiles three-quarters of an inch thick we have protected a wooden frame for two hours from a constant stroke of fire. With two inches of thickness, and a little air-space between the walls of the terra cotta, I have protected a piece of wood from a live coal furnace fire for two hours. So great was the non-conducting value of that burned clay that the boards were green at the end of the test. Not enough heat had passed through to dry out the moisture of the boards. What I have tried to do, beginning with the year 1871, has been to convince the architects of this country that the most valuable thing on God's earth for use in fire-proof construction was porous clay work. With that material, made of fire clay, I hardly dare to tell you what results I have had in some experimental tests I have made. In 1881 the architects of the city of Boston induced the Mechanics' Institute there to offer a prize for the best fire-proofing material, and the best fire-proofing methods. A sample of material was brought from every concern engaged in the manufacture of fire-proofing material in the country, and the only thing that stood the test of fire, water and frost was porous terra cotta.

Now, I have been interested in the business for thirty years, and spent a very large amount of money in the business, and spent some months, and even years, in Europe studying the question, and I could talk for three weeks and tell you something new every minute, but I think I have said enough. [Cries, "Go on. Go on."] The subject is too great. I went into it with all my heart and soul, and I have found this—that when a man goes into this business with his heart and soul, he never can leave it and never can lose his interest in it. [Applause.] It has not brought me a mouthful of bread in ten years.

Now, gentlemen, in conclusion, a suggestion: I wish you would change the name of your Association to the National Clayworkers' Association, and in that way broaden your ideas and the ideas that people may have of this Association. I have intense respect for the name "brick," and for brick; but I would rather have you call yourselves clayworkers, because then your work would start from the bottom and go to the top, and the top is as high as it is possible for any human being in any manufacturing industry in the world to climb. You cannot go beyond it. [Applause.]

Mr. Eudaly: I move that a vote of thanks be extended to the gentleman for his able address, which I understand he has come all the way from Syracuse to deliver.

Unanimously carried.

Mr. Loring: Gentlemen, I want to say just this—that I have here a little package of copies of drawing of fire-proofing work that was done in the years from 1874 to 1877, which has not been excelled since; and if any of the gentlemen present are curious enough to examine the work, I shall be delighted to have you look at some of the old things that are as good as were ever made.

The President: We will now proceed to the matter of the report of the Committee on Technical Investigation, which will be presented by Prof. Edward Orton, Jr.

#### REPORT OF THE COMMITTEE ON TECHNICAL INVESTIGATION.

Gentlemen of the Convention: According to resolution adopted at the last meeting at Buffalo, a committee of five, consisting of D. V. Purington, chairman, Anthony Ittner, W. D. Richardson, Charles A. Bloomfield and Professor Edward Orton, Jr., secretary, was appointed by President Brush to put into effect the plans for technical investigation adopted at Buffalo.

The first meeting of this Committee was held in Columbus

on April 7th, at which also several other prominent members of the Association were present. Here the various plans for selecting an applicant for the position of scholarship, the various plans for determining the work which should be undertaken by the scholarship, and all other matters necessary and incidental to the efficient operation of the Association's plans, were duly taken up and considered. A joint meeting between the Committee of the Association and the Trustees of the Ohio State University was had and the proposals of the Association were accepted by the Board, who added to the resources of the scholarship the sum of \$100.00, to be expended in furthering its ends. The machinery necessary to the introduction of this work was decided upon as follows:

First—That the question which should be made the subject of investigation under the terms of the scholarship should be balloted upon by the members of the Association and the Secretary was instructed to prepare a printed ballot on which should be included four questions, which are here given in their relative order:

1. Investigation to determine the effect of structure on the wearing power of paving brick.
2. Investigation to determine the relation between the hardness and frost resistance in burnt clay wares.
3. Investigation to determine the causes and efflorescence during drying and water smoking of clay wares.
4. Investigation into the relation between clays physical and chemical properties and its feed and safety in drying.
5. Any original subject to be propounded by the balloter.

Copies of this ballot were ordered to be sent to each member of the Association in good standing, and on the receipt of the return ballots, for which provision was made by enclosed envel-



C. McDERMOTT, Wellington, O., N. B. M. A. Songwriter and Vocalist.

ope, the subject receiving the greatest number of votes should be made the subject of the first year's investigation.

Relative to the selection of the applicant for the position the following plan of operation was decided upon: The Secretary was ordered to prepare and insert in the technical papers of the clay industry a statement that on June 13, 1897, a competitive examination would be held at the Ohio State University and giving a list of the various subjects which the examination would cover. The relative grading of the subjects should be definitely announced, together with the maximum grading possible as a result of the examination. It should also be announced that besides the examination the applicants would be required to furnish statements of their experience in the clay industries, and to furnish such other matter as the Committee might require to determine their fitness for this work.

The Committee also inspected the department at the University with a view to determining in what respect its work could be most efficiently handled.

Pursuant to these resolutions the Secretary prepared the ballots and notice of the examination, and in due time both were issued as described. The subject chosen for the effect of structure on the the investigation to determine the effect of structure on the wearing power of paving brick, this question receiving forty-six votes out of a total of one hundred and thirty-six. The question receiving the next highest number was question number two, relative to determining the relation between hardness and frost resistance in burnt clay works. The examination for scholarship was held on the appointed date, each applicant being required to sign a properly prepared form in which he gave the necessary information as to his past experience and agreed to bind himself by the terms of the scholarship in case he should be the winner in the competition. The examination was then held. Three candidates presented themselves. The reports of the examination were forwarded to the members of the Committee on June 11th,



and each endorsed on the form prepared his choice from the data presented. Mr. Albert Victor Bleininger was the unanimous choice of the Committee, he having received highest grade in scholarship as well as having shown the widest practical experience. Mr. Bleininger was notified at once of his election to the position and rendered his formal acceptance of the office on June 20th.

Prior to the opening of the University on September 15, Secretary Randall, of the Association, delivered to the Secretary of the Commission a check for \$250.00, being the amount of the appropriation for the year's work. This check was duly turned over to the Secretary of the Ohio State University and endorsed to the credit of the Department of Ceramics for the use of the scholarship fund. At the same time the \$100.00 appropriated by the Board of Trustees was formally credited to the same fund. The work of the scholarship begun promptly on September 15, one half of the time of the student, namely, from 1 p. m., to 5 p. m. each school day, and from 7 a. m. to 12 m. on Saturdays, being devoted to the work of the Association. It was decided that the investigation on the subject in hand should be conducted on a variety of clays, not less than ten in number, which should represent all phases of the clays actually in use in paving brick industry. The work of correspondence towards obtaining these clays free of expense, to the scholarship fund, was begun at once and a number of circular letters were prepared and sent to clay manufacturers in various parts of the country whose clays were known to represent the types which it was proposed to study. On account of distance and the expense of shipment of such large quantities of clays as were required, the responses were not as prompt and satisfactory as could be desired. Nevertheless, in about one month clays had been received from several firms and promises from various others had been received, the clays to follow at a later date. At the present time clays to the number of twelve have been received or definitely arranged for. The amount designated for these tests was two tons as a minimum, the amount being increased to three or five tons in certain cases. It was asked that the clays should be delivered ground and screened ready for use in order to reduce the labor necessary in their working. The mechanical equipment of the department necessary to complete the investigation was also taken up at an early day and arrangements made for the use of an additional auger machine of the end cut variety, together with a hand dry press and a set of molds for the soft mud process. At this time it was the intention to include in the investigation brick made by the soft mud, stiff mud and dry press processes. As the work progressed it became evident that it would be impossible with the amount of the appropriation and the amount of labor available, to complete so particular an investigation in the period of time assigned, and owing to the difficulty in securing a dry press which would be accepted as the equivalent of those most largely in use in the industry, it was reluctantly decided during the holidays to give up the soft mud and dry press processes as a part of this year's investigation and to confine the work to a closer and fuller investigation of the stiff mud process. The work of the scholarship as now arranged and in progress will comprise the following series of tests:

1. A comparison of ten or more clays made up alternately by the end cut and side cut process. These clays being tempered from the same ground material and dried and burnt in the same kiln side by side, will reduce all possible variations in the product to the one variation of mechanical construction of the bar.

A second series of tests on the same clays will develop the value of repressing as ordinarily carried out, every other brick of each batch being saved for repressing and every other one remaining plain. The repress die used in this test is one into which the brick slipped with difficulty and represents the lowest flow which is commercially possible in repressing.

A third series of tests, comprising three clays, two of which are shales and one a fire clay, was begun for the purpose of investigating the effect of repressing under varying conditions. Accordingly a larger die was procured, fitting the same repress, and every other brick was reserved for treatment in this die, the first, however, being treated in the small die as described before. These tests were made on both side cut and end cut brick on each clay, and the results will comprise six kilns of ware, or about fifty rattling tests. Besides this question of flow in the tight and loose die, it was desired to investigate the effect of completely breaking up the structure imparted by the auger machine and substituting a structure due to pressure in the repress die, and accordingly a series from the same clays and from alternate bricks as before was made in which the brick were pressed on edge and crushed, so that the flow was very great and the original structure completely broken up. It is hoped that this investigation will throw a valuable light on the whole question of repressing.

A fourth series of tests was begun on a question not absolutely included in the subject as proposed in the ballot, but which the proper conduct of the work already undertaken made necessary. This was a determination of the effect of size on the rate of abrasion in the rattling process. For instance, the largest bricks made require only sixteen for a charge and the smallest require twenty-two or more. It seemed impossible in the absence of accurate knowledge, to feel sure that the rate of abrasion in two such charges from the same clay would necessarily be the same, even though it were proven that both occupied fifteen per cent. of the rattler volume. Hence, a series of tests was begun, each test comprising brick of these different sizes, beginning with the smallest standard size and ending with the largest block size. These different sizes were made from two side cut auger dies, and by means of three different thicknesses in the repress dies. These brick will be burnt all together and each size tested by itself, and it is expected that it will be possible to show what effect the size will have on the rate of abrasion.

This comprises all of the work at present mapped out and under way. About one-half of the manufacturing of the brick is now completed. The machinery is all in place and in constant or frequent operation. Eight of the twelve clays selected are on hand, five of which have been passed through the machinery and worked up. The burning is progressing regularly at one kiln per week, four days and nights being spent on the burning and three in cooling and changing the contents. The testing of the materials already turned out has been begun. According to the present plans, the manufacturing of the material will be completed by April 1st. The burning will be completed by the middle of May, and it is hoped that the testing can be completed by the middle of June at the close of the scholarship year.

Prof. Edward Orton, Jr.: This is our formal report; but I think, without question, that we will have data sufficient to

settle the question of end-cut against side-cut, and to tell us whether the deductions made last year from the study of one clay are borne out by the results of the study of twelve other clays. If they are not borne out as a whole, they may be true of one kind or class of clays, or last year's deduction may be merely an accidental effect.

It will tell us, also, the effect of repressing; the investigation will comprise the results of over one hundred tests of brick made and burned side by side and tested in this way. In our little kiln, which contains fifteen courses, every course contains four or more kinds of brick, and in each course is the same proportionate number of each kind of brick being tested. If for any reason we get a poor burn on the kiln, and the top is harder than the bottom, and each sort will be in the same proportion throughout the kiln; so that even if the results, considered technically, are bad, the fact will remain that the structure test will apply fairly nevertheless. Also, I think that a very valuable side light will be thrown on the rattler test, one feature of which was left untouched in the report of the Paving Test Commission.

Relative to the Paving Brick Commission, I wish to say that the results as worked out by that body and reported to the Association a year ago will do, in my judgment, a great deal of good, and as time goes on this Association will take the subject up again, appoint another Commission, and revise the knowledge acquired to date, and modify possibly what we have already produced. So far I feel satisfied with the test; but now new features are coming in, and of necessity we shall have to bring ourselves up to date before many years pass by, probably before more than one or two years pass by. Meanwhile, I beg to assure the Association that the work of the committee and the work of the scholarship is progressing as well as we can expect, and we hope to present to you next June or July the first portion of our results, which I hope will be completed and published in full long before the time of the next Convention.

The President: What is the pleasure of the Convention with reference to this report?

Mr. Eudaly: I think, Mr. President, that we should express our approval of the work that has been carried on thus far by this committee, and I therefore move that it is the sense of the Convention assembled that we heartily approve of the work as thus far carried on, and also that we approve of the continuation of the work as mapped out.

Motion carried.

The President: We will now proceed to discuss the balance of the questions left over from the morning session. We will take up No. 28:

**"IS IT BEST TO SET DRY-PRESS BRICK IN THE KILN DIRECT FROM MACHINE, OR TO PASS THEM THROUGH THE DRYER, ECONOMY IN DRYING AND QUALITY OF BRICK CONSIDERED?"**

Mr. Eudaly: I should say that it is not best to set dry-press brick in a kiln direct from a machine.

Mr. Ittner: I did not expect to say anything on this subject, but as long as Mr. Eudaly has made the statement that he has, if I remain silent, of course it will be considered that I have given my endorsement to that statement. While I have never had any experience—and I will be frank enough with the Convention to make that statement—of drying brick in what is known as a dryer, I have some knowledge of the results that I get by the other method that I do employ. That is, putting bricks directly from the machine into the kiln in which they are to be burned; also drying them in the kiln. As I have stated previously, we have kilns of a capacity of 170,000 press bricks, and about 185,000 or 190,000 common brick. These kilns we dry off, by the methods that we employ, in four days. I do not think that brick can be dried by any method known to the art more perfectly than we dry them. I wish to say, further, that I am disposed to believe that there would be one object to be gained by first drying them in a dryer, before putting them into the kiln where they are to be burned. That would be in the



matter of sticking or adhering. But we have very little trouble from that cause now. Formerly we had considerable difficulty by our bricks sticking together and not coming apart as soon as we would touch them. But now we have very little trouble from the sticking, and the little trouble we do have is not a matter of any great concern. It is so slight that it does not bother us. I state again that I do not believe there is any method that can be employed in the drying of brick that would dry them any more than by our present method; and as far as cheapness is concerned, I think it is the best. Mr. Taylor makes a suggestion to me, and perhaps it would be only fair to say that I should claim that for my own clay only, but I have made statements on this floor previous to this, and I will make now a general statement—that whenever I speak of the manufacture of brick, it is by my own methods and from my own clay. I know nothing of others.

Mr. T. B. McAvoy: You make a dry-clay brick?

Mr. Ittner: I never made any other.

Mr. McAvoy: That does not require any drying.

Mr. Ittner: I will say a word in regard to the remark of Brother McAvoy. That may be pleasant to him, but I do not wish to take up the time of the meeting. He says that dry-clay brick does not need any drying. I say that they need more drying than those made by the stiff-mud or soft-mud brick. They are harder to dry than those made by the stiff-mud or soft-clay process. [Applause.]

Mr. Eudaly: I desire to ask Mr. Ittner a question. I visited his yard once, and through his kindness saw almost everything there; and I remember that you did put your high-grade brick, fine ornamental brick, in some sort of shed or dryer. Am I mistaken?

Mr. Ittner: I think you are mistaken.

Mr. Eudaly: I know there are many who make dry-press brick and purport to take them from the machine to the dryer, who, nevertheless, dry their high-grade brick in a shed before they set them in a kiln.

Mr. Ittner: In answer to Mr. Eudaly, I will say that we do not make a special point of that, but sometimes, when we are making ornamental bricks, and when we have more made than we can put into the kiln, we set them aside, and, of course, if they stay there a week or two, they may be said to be largely dried when put in the kiln. We do this only with ornamental brick—no other brick.

The President: We will now consider Question 30:

"WILL AN IRON STACK DO AS GOOD WORK ON A CONTINUOUS KILN AS A BRICK STACK?"

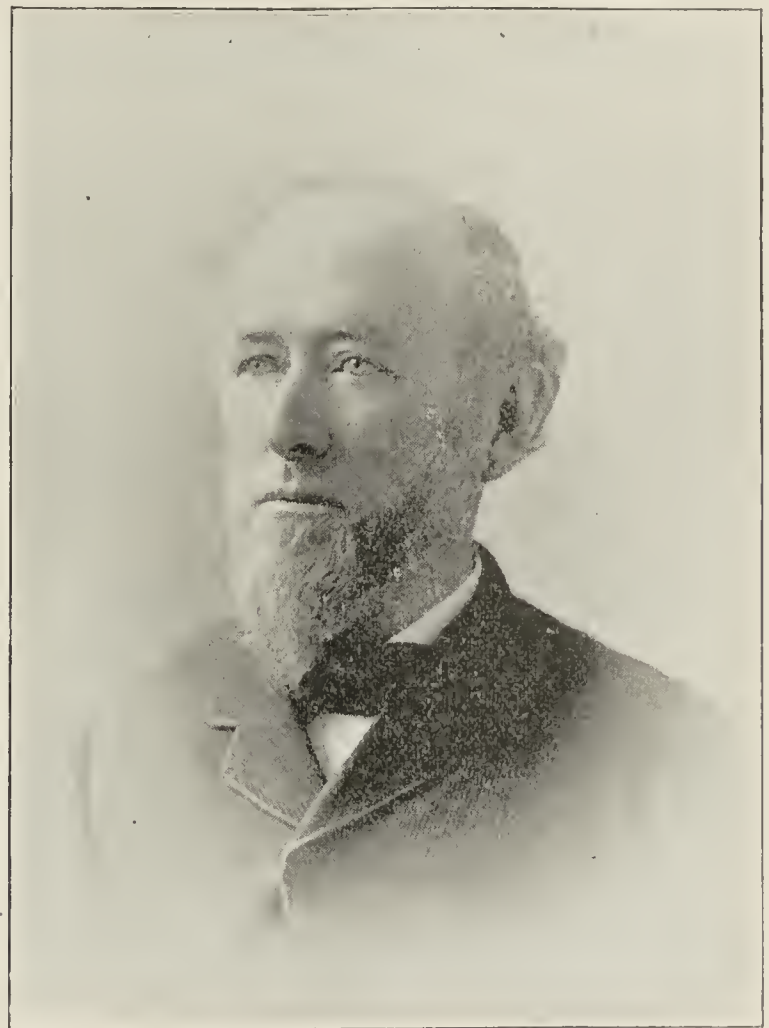
Mr. Pike: I say no.

Mr. D. V. Purington: I endorse what Mr. Pike says.

Mr. Carmichael: I would say no—emphatically no.

Mr. Carson: Experience has taught me that iron stacks are not a success used in connection with continuous kilns. They are not good theoretically, and practice has proven their use to be a source of loss and annoyance. To fully appreciate the disadvantages of an iron stack one must thoroughly understand the working of a continuous kiln. Every brickmaker knows (some by bitter experience) that these kilns cost a lot of money to build, and if this is not done right they will cost as much to maintain, so it must be to our interest to know all there is to know about them before building. The stack is often a weak point in the construction, in fact, it is often only a secondary consideration, as something just to carry off the smoke. One of the strongest points in favor of the continuous kiln is, that almost all of the heat of the fuel is utilized to burn and dry the brick, consequently if the kiln is working properly there is never more than a moderate warmth of gases ascending the stack. In the case of boilers, or the ordinary down-draft kilns, the gases, after performing their functions, are liberated direct to the atmosphere, often extremely hot, but in the continuous kiln the gases on leaving the burning chamber, or chambers, are passed through a series of consecutive chambers, losing

heat, but accumulating moisture and impurities. Thus heavily charged they reach the stack and commence the ascent. I think it will be conceded that gases in this condition require assistance, rather than obstruction, to make a free exit. But right here is where the iron gets in its fine work by inducing condensation, which means effective obstruction, and the gases, sulphur alkali, etc., retaliates by eating out the vitals of the iron. I have known good continuous kilns to be condemned as failures when the only trouble was in the iron stack. In one case a four and one-half-inch brick lining proved a success, demonstrating that a stack to meet these requirements successfully must be of a non-conducting material, which, of course, means bricks. In another case, the stack rotted down after standing only nineteen months, and after only twelve months of actual work. This stack had a brick foundation five feet high above and about two feet below the inlet flue. This space was found to be full to half the flue opening, with a slimy composition, mixed liberally with iron scales. I saw this, and after the brick stack, subsequently erected, had been working two years I made another inspection and found the bottom entirely



THOS. H. FLOOD, Philadelphia, Pa.

clean, except for a few inches of dry dust. One need hardly draw conclusions—they are too obvious. Of course, all iron stacks are not as short-lived as this one, but none will compare favorably with brick for lasting qualities and general efficiency. Another important point is the consumption of fuel. You are not saving much if you are compelled to keep a fire burning twenty-four hours of every day at the bottom of the stack to promote circulation. This is often the case with iron stacks. If you do not have a good circulation, or sufficient draft, in the continuous kiln, your brick are liable to be badly stained from the practice of passing the waste gases and their accumulations through the moist bricks to dry them.

To be brief, there are two prominent objections to the use of an iron stack in connection with continuous kilns; its life is short, and its working unsatisfactory, and certainly not economical.

Mr. D. V. Purington: I want to call the attention of this Association, not to one of these instances, but at least in a half dozen others, that when our young friend Carson is called upon



to open these topical discussions, he always evidences having made preparation and of having looked up the subject, by committing his ideas to writing, and it should be an example to the rest of us. [Applause.]

Mr. Loring: This question is in connection with the relative cost of a metal and a brick stack. It was my privilege, two years ago, to have this question submitted to me to solve, and I have solved it. The question was, Can you build a stack eight feet in diameter, one hundred and fifty feet high, of brick, that will cost no more than steel? I answered yes. The situation was near a creek, and the foundation was doubtful. I took a three-inch pipe and I made a skeleton frame, and I lined that skeleton frame with hollow blocks of porous terra cotta. I faced them with face brick, and the stack, one hundred and fifty feet high, eight feet clear in the inside, has about one-third the material used in an ordinary brick stack. It has a better non-conducting value than two feet of brickwork. An eight-inch hollow porous terra cotta flue and a four-inch facing of press brick. The stack cost about \$2,500. Some stacks cost \$5,750. A steel stack would cost \$3,200.

Mr. Hervey Haigh, Catskill, N. Y.: I have erected a stack in Catskill of nothing but brick. We figured the brick at six dollars a thousand, and it took 170,000 of our brick. On that basis, our stack cost considerably less than our friend spoke of in the case of the iron stack.

Mr. Loring: In giving the figures, I simply give the figures as they would apply in the case I had in mind. The chimney I spoke of as costing \$2,500 was something more than a common chimney. The brick cost about eight dollars a thousand delivered on the ground, and the porous material came from Canada.

Mr. Haigh.—The cost of our stack was \$1,870.

Mr. Eudaly.—In order to build a steel or iron stack, so as to have the same draft in all kinds of weather, you will spend more money on the steel stack than to build one of brick; to get the same draft, you will have to spend more money on the steel stack, and it will not last so long.

The President.—This last question exhausts those which were on the programme for this morning, and we will now proceed to the questions set for this afternoon. The first is 35:—"How is Clay Calcined and What is the Cost? If it Can be Done Cheaply, Would it be Feasible and Beneficial, in the Manufacture of Paving Brick, to Use a Small Proportion of Calcined Clay with Shale that Vitrifies too Readily? What would be the Effect on the Brick?"

The President.—If there is no discussion on this question we will proceed to the next, 36—"How Fine Should Shale be Ground to Make the Best Pavers?"

Mr. D. V. Purington.—The finer the better.

The President.—We will take up question 37—"Should a Kiln of Pavers be Closed Up Absolutely Tight After the Burn is Finished?"

Mr. Pike.—That depends.

Mr. Eudaly.—Different in different localities.

The President.—We will now consider question 38—

"DOES AGE, WHEN IN USE, OR WHEN UNDER COVER AND NOT EXPOSED DIRECTLY TO WEATHER, IMPROVE BRICK IN RESISTANCE TO ABRASIONS?"

Mr. J. W. Carson.—There is more in this question than appears on the surface, in fact, six months ago, we would have thought of it as having very little practical value, but about that time we had put in our works an N. B. M. A. standard rattler, which opened up new conditions, as it were, of which this question was the outcome. In using this rattler to test our paving brick, the manufacture of which we had just commenced, we were striving mainly to find which specified mixture of our material would come nearest to the best results of Prof. Orton's experiments, and give us the best possible paving brick.

It may simplify matters if I here state that we had several different makes of experimental paving brick, both plain and repressed on our yard. They were all made on an end-cut machine.

Before putting in the rattler, we had changed our method to the side-cut, to meet the demand for hard plastic building brick, those intended for pavers being repressed. We had noted very carefully the deduction of Prof. Orton, and his assertion that end-cut brick repressed, stood the rattler test better than the side-cut repressed, interested us very much, having in mind our change of cutting method.

We decided (as we had both kinds) to make some tests to satisfy ourselves on the basis of our own material. Our experienced proved, in our case, the correctness of Prof. Orton's statement. During a series of tests, we found such a great variation in brick, that we considered equal from every conceivable stand-point, that we were convinced of some hidden condition that effected their standing, so to follow the thread to its source, we undertook a further series of experiments.

First—We took a block of brick direct from the kiln, half we tested by putting direct from kiln into rattler, the other half we soaked for twenty-four hours and then put into rattler without any drying. The result was greatly in favor of the soaked brick.

Second—We took a block (also side-cut) from a pile on the yard, exposed to the weather. Half of this we rattler direct, the other half we dried on our kiln for about fourteen hours, allowed to cool and then rattled. The result was in favor of the brick direct from yard.

Our end cut brick tested on the latter basis showed a corresponding variation. To further satisfy ourselves we procured a batch of foreign paving brick, and followed the same courses, with a like result, though not quite so pronounced as with our own brick. We were so interested in these experiments that we laid the data before a few experts to get their opinions, but to our surprise it was a new development even to them, and in only one case did we get an opinion which seemed to fit the case and which we now lay before you.

It was the opinion of this gentleman, that the constituents of the brick after burning were something on the cement order, and after the manner of cement, was further solidified and hardened by the moist atmosphere. It seems to us a very valuable suggestion, and one which follows sensible lines, but we felt we would like the sense of this convention on this point, and so added our quota to the question box. We have heard of instances of engineers preferring old building brick to new ones because of their superior strength, though we could never find out the why of this, but this paving brick experience of our leads us to believe there must be something besides sentiment in their preference.

Mr. James W. Tester, Montreal, Can.—I may say that Mr. Carson and myself are associated in the brick-yard in the manufacture of the paving bricks, concerning the experiments with which Mr. Carson has told you. You will see that the conclusion is that water improves paving brick. This may be somewhat of a surprise to you, as it has been to us, because it is generally supposed that the drier a brick is kept the better for the brick; and we took for granted that that applied to paving bricks as well as to building bricks. We were very much surprised and interested at what we discovered in this matter; and we thought we would bring it before your honorable body to have the sense of the members, and their experience, if they choose to give it, to see if it tallied in any way with our own. There are some matters on which the Committee on Technical Investigation, as I understand it, took no thought of, and paid no attention to the value of it, if value there is, and we present it so as to have a full discussion of it, to learn if the facts which we find are generally known. We would like to know, next, if this feature is general among all manufacturers. Previous to putting in the rattler—it is of standard size and conditions, and all these tests were made under standard conditions—we were in the habit of going to a foundry where we had the use of a rattler pretty near the standard size. Our foundry friend allowed us



free access to the rattler. We also took some bricks to the McGill University in Montreal, than which there is no better, and we found it unsatisfactory, because there was so much running around. The results of the tests at the McGill University and the foundry were so far apart with such erratic variations, that we concluded there was something wrong either with the kind of test, or the way in which it was done. We were disposed to think the standard test did not amount to much. However, we put in the rattler and started our series of tests, to make the discoveries which Mr. Carson has described. I mention this experience we have gone through, so that you will understand our position. It may be that some material is not affected at all. It may be that some is affected more than others; but what is quite necessary is for each maker to know how his own material works in this particular case—the matter of water—because he is entitled to present his material to the market when it is in its best condition. So if you discover by the rattler test that your bricks test poorly when they first come out of the kiln, probably after they have been in the yard, age and this other effect, whatever it is, comes in, does good work, and in six months after you have a first-class brick. If this works out as we think it may, it will require some addition to be made to the standard test. The standard test is the rattling test, and the condition of age is not considered. The new brick is at a disadvantage compared with the old brick. Another feature we found very peculiar was that the last test we made—we have considerably more rains than you have, and our rivers are frozen solid and navigation closed and a large quantity of snow—but before closing in November we made our last test, and to our surprise we found that they improved still more on the test we made—that bricks that had been in the yard improved on those freshly burned, and on the last test they improved more. We sought for the reason, and it occurred to us that the previous three or four days the temperature had been at zero, and we concluded it was frost, and we are satisfied that the frost increased resistance. Frost is not a prominent feature, but we mention this incidentally. We found that the intense frost for a couple of days had increased the toughness of the brick. We submitted the data we made on the subject to Prof. Orton, and he replied to our communications; and I would now ask him to make any remarks he may consider proper on the subject that may be of interest to the convention.

Prof. Orton, Columbus, O.—In view of the standard rattler test work which was done for the Association a year ago, and my responsibility for that particular part of the report, I naturally took very deep interest in the communication which Mr. Tester sent me some weeks ago. It was a great surprise, I assure you. All the consideration which had been devoted by the Paving Brick Commission, to the effect of water on a paving brick had been from the opposite point of view. We discussed in the meetings of the Commission the question as to what effect the rattler test might have on the absorption test, but no heed was taken as to what effect the absorption of the brick might have on the rattler test; so that the communication was entirely novel. I was not disposed to accept the statements as final until Mr. Tester sent me his results in full, carefully worked out. I at once realized the great importance of this discovery. It is of great practical importance and technical interest if it can be verified; but there is the point.

I have in my laboratory the remainder of the brick which we procured for the experimental work of the Paving Brick Commission in determining the standard method for the rattler test. In making this sample batch, we selected the brick as we wanted them, they came out of the heart of a kiln, where they were all hard burned. They were as fine a body of brick as could possibly be. They came out of the kiln on a warm summer day, and were shipped to Columbus direct; they were not exposed to any rain. They were unloaded and stored in my laboratory, and have been there at a tempera-

ture of about 70 degrees in winter and about 60 in summer. They have been in that place now for nearly two years. I do not know what effect age may have had on that brick, but I do know that the rattler test they give now in the dry condition is substantially the same as two years ago. It has not changed enough for me to detect it. I know that the difference is very small, if any really exists. Bearing out Mr. Tester's argument, I took sixteen charges of brick, twenty-two bricks each. The first four of them I weighed up and put in the rattler, and determined their loss by abrasion, by the regular standard method. I found an average loss of 27.3 of the brick, dry. I then took four charges and soaked them in water from seven to ten days—I do not remember exactly the time, but it was between seven and ten days—immersed all that time. I took these direct from the water and wiped them dry, and weighed them to determine the absorption. It was about 1 per cent. or 1 and 1-10 per cent. I rattled these four charges and found an average loss of 25.14. I then took four charges, soaked them in water from seven to ten days, and put them outside of the laboratory and left them out



J. W. CARSON, La Prairie, P. Q., Can.

thirty-six days, during which time they were exposed to two blizzards and two thawing spells and considerable rain. They had an opportunity to dry out some and to soak up further water, and they were frozen while wet, as wet as they could be, holding as much water as they could contain. At the time they were finally brought in for test they were not frozen. Four charges of these tested with an average loss of 23.86. Taking the loss on the four charges of dry bricks, as a standard, and calling that 100 per cent., the charges which had been soaked only lost 92 per cent. That is to say, the loss is reduced by 8 per cent. after soaking, and by the exposure of thirty-six days to the weather, the reduction is 12½ per cent. I also put out four other charges, treated in the same way by exposure to the weather, my object being to keep them out there until a good freezing spell came, and bring them in while full of frost; but my helper, in an excess of zeal, got two of these batches tested before I knew it. The average of the first four charges, above referred to, was 23.86. The average of the last two was 23.88. The two other charges, still remaining, I still have out in the weather and will leave them six months before testing.



I want to say to the Association that I spoke a moment ago about the probable necessity of revising our paving brick test, or directing the paving brick commission at some time to take cognizance of new points; I had this matter in mind at that time, but it is not likely that this will be the only new matter coming up. We did the best we could in the work of the paving brick commission a year or so ago, and are not ashamed of the results; but it is likely that such things as these will crop up all the time, and we will not get to the end of it at once. I want to say to the Association that I have gone at the problem of working this out the best I can for myself; that is, separately from the scholarship work in hand, and I have asked the manufacturers of paving brick around the part of the country where I live to send me samples. I would like three hundred of each kind of paving bricks—the hardest and the softest. I think the percentage of water absorbed is going to be an important thing in this matter. From Mr. Tester's data, I calculate that he had 2.35 per cent. of absorption, as nearly as I could get at it. I find in the results of my tests exactly similar tendencies to those found by Mr. Tester, but very much less in amount—I find the water percentage of my brick is only about 1.10 per cent. The percentage of water which bricks take in is going to be important in this connection, I think, and for that reason, I want to get both hard burned brick and soft burned brick of the same makes in order to test this point. I prefer that they should be sent from the kilns direct without allowing them to get wet. I am willing to undergo all the expense of making tests in order to get at the truth of this matter. I think in six months or a year from now, we can know exactly what the effect of weather, and water and frost will be on paving brick; that is, such qualities of paving brick as are now in the market. I have not all the kinds of brick needed to make my tests conclusive and I have been pounding away at the manufacturers of paving brick in my own locality so much that I am becoming ashamed to ask them to send me more material. If there are any gentlemen in this convention, who make paving brick and have an interest in this matter sufficient to justify them in sending such bricks as I use for the test, I will receive them and test them, free of expense to them.

Mr. W. A. Eudaly, Cincinnati.—Mr. President, I do not believe there has been anything brought before this convention of more interest than this last question. The points brought out are entirely new to me, and I presume to a large proportion of the gentlemen present. I did know that common building brick—I never tested paving brick—after they were aged would stand more crushing than when they were brought fresh from the kiln. Formerly, the only common way brick were tested was by crushing. We could get a better test by crushing from old brick. These investigations are going to work wonders for us, and we ought to encourage them all we can, even if we have to put up a little cash.

Mr. W. S. Purington, Galesburg.—This shows that brick pavement gets worse wear the first weeks it is down, in the case of shale especially. They seem to improve with age and service, but in our territory, many of the city officials ask for a certain number of brick for testing. They often use a certain number of them for the absorption test, then dry the same brick out and use them in the rattler test. Should it be proven that brick with a certain amount of water in them are better, it would be necessary for us to furnish enough samples to make tests of different brick both for rattler and absorption test.

The President.—We will take the next question, 39—"Can Paving Brick be Burned Successfully in the Continuous Kiln?"

Mr. H. Haigh.—We have a large continuous kiln for burning paving brick; and I can assure you it is successful.

The President.—Question 40 is next—

"HOW CAN THE ELEMENT OF NOISE IN BRICK PAVEMENTS BE OBVIATED OR MINIMIZED?"

Mr. D. V. Purington.—Rubber tires.

Mr. C. H. Merrick, Syracuse.—In a conversation with Mr. Jas. L. Breed, the manager of the New York Brick and Paving Company, of Syracuse, he spoke of this point the other day, and among other things he said that he believed, in fact he was satisfied, that the rumbling noise coming from a brick pavement was caused by the shrinkage of the cement under the brick; that the pavement is so frequently laid quickly over green cement, as we know, it shrinks more or less, leaving a small space under the brick pavement, thereby making the rumbling noise as the vehicles pass over it. It struck me as being very reasonable. I know of the workings of cement as a builder, and I know that there is more or less shrinkage; and when he gave me this idea, I said "You are right; that is the cause." The remedy in his opinion and mine is that the cement when put down should be left until thoroughly dry. Then place your pavement over it, and you will get rid of a large amount of noise, if not all. Then you will have a pavement which will give as little noise as the asphalt.

Mr. Carmichael, Wellsburg, West Va.—I desire to ask a question of the convention. Do not our city officials clean our streets too clean? In other words, would we not have better results on the paved streets, as to the life of the pavement and the deadening of noise, if a quarter of an inch of dirt were left on the street.

Mr. D. V. Purington.—There is no question about that. One of the unfortunate things is that the very thing we are trying to get rid of is one of the chief inducements for advocating brick pavements. I had not thought of the matter in the light suggested by Mr. Merrick, and I am not sure but what there is something in it. It is one of the things we cannot get around—that brick pavement is noisier than wood or asphalt. We have laid in Galesburg, Ill., quite a large amount of street paving during the past year; single course work; just the red clay graded, with a coating of sand, and the brick on that. We have had some down two years, which has retained its form, and the pavement is as perfect as any we have had anything to do with. In driving over that pavement I have noticed that there is a difference in the metallic ring, over even the two course work. We have no concrete foundations. All the other pavements are a flat course for the foundation and the edgewise course on that, and there is a difference in the noise; it is not a great deal, but enough to be noticeable. Driving off one piece of pavement, with two course work, on to the other with the clay foundation, it is a great deal more quiet. It is altogether possible that there is something in the suggestion as made by Mr. Breed in regard to the noise.

Mr. T. A. Randall, Indianapolis.—I have had an experience along that line myself. I live on a brick paved street. The first block or brick pavement in our city went down on our street. It was laid on concrete foundation, with nothing but a thin layer of sand between the concrete and the brick pavement. I am confident—though it has not been taken up to demonstrate it—that the concrete has shrunk from the brick, and the curbs have held the brick in place, and the shrinkage of the concrete has caused a hollow space beneath the brick. There is a roar from the pavement which is objectionable and it is these things which hurt brick pavements in the estimation of the people. I believe if the paving brick men will see to it that the brick are laid properly, that brick pavements will become more popular in large cities as well as small ones. Mr. Carmichael says if the streets were not kept so clean the noise would not bother anyone. But they are kept clean. We in the large cities are getting more fastidious and exacting every year and keep our streets clean as we never did before; consequently complaint is made of noisy pavements. It seems to me that if brick are laid in a thick bed of sand there will be little or no rumbling. The pavement I refer to is literally a sounding-board and is very objectionable, solely because of the noise. Otherwise it is perfectly satisfactory. It has been



down six or eight years, and is as good almost as when first laid. I am confident that as Mr. Merrick says, the cement foundation shrank away from the brick, leaving a hollow space between the brick and concrete. The space between the brick was filled with cement which I think makes a noisier pavement than a sand filler.

Mr. W. A. Eudaly, Cincinnati.—I saw a street in Columbus, Ohio, exactly as Mr. Randall represents his street—the concrete had shrunk away from the brick, and immediately on vehicles striking that part of the street there was a roar, while on another part of the brick paved street it was not so. I have not yet got to the point where I am willing to admit that streets paved with brick are noisy. I do not admit that. If you put a sounding-board under them, it is the sounding-board that is noisy. The brick are not noisy.

Mr. A. Ittner, St. Louis.—I think Mr. Randall gave the true solution of this trouble, but did not give entirely the cause. Now, I have ridden over brick streets that sounded exactly like a drum, and my judgment was this—that it never occurred, as far as I am advised, unless it was frosty weather. My idea is that perhaps in the brick themselves there is expansion, and if it be not expansion in the brick themselves, the street is always made with a certain amount of curvature. It is different in different cities. My theory is this—the brick are laid against the curbstone, and the earth under the sidewalk or the earth between the sidewalk and curb when it freezes expands, and, of course, it expands towards the roadway from each side, and as this expansion takes place in the earth, it crowds up the pavement in the street. The tendency of the pavement is to go up, because it has a crown shape. I believe that is what causes the rumbling. It is only, so far as my experience goes, in the winter time that this rumbling sound occurs.

Mr. Eudaly.—I do not understand Mr. Ittner's philosophy in stating that the frost produces expansion. I thought it was heat that produces expansion.

Mr. Ittner.—I think that freezing expands the earth; that is my judgment, the earth being damp, causes the expansion.

Mr. W. R. Cunningham, Frankfort, Ind.—I think it is due to expansion, and that city engineers should make allowance for expansion of the earth, the same as engineers do in erecting iron structures.

Mr. J. H. Chambers, Philadelphia.—I have knowledge of pavements in Wilmington, Del., laid as Mr. Randall describes, but in addition to that the upper course of brick was covered with liquid cement, which ran into the interstices between the brick. The noise was very evident both winter and summer. The city engineer suspected that the cause was what Mr. Randall has surmised, and he took an opportunity to have the street broken to examine the pavement, and he found that the concrete preparation had sunk away from the upper course of brick.

Mr. D. V. Purington.—There is one thing in regard to the noise, which has occurred to me many times—I find wherever I have been accustomed to use brick pavements that the interstices, if they are filled with sand, the noise is much less than where they are filled with pitch or cement, for the reason that the pavement becomes homogenous when the latter is used. When pitch or cement is put in there is a resonance which you do not obtain when each brick is embedded in sand. For that reason I certainly favor sand, above asphalt or pitch, because in the course of two or three years evaporation takes place and disintegration occurs and nothing is left of the asphalt or pitch but a residuum of resin. The engineers who provide for a pitch filling are making a mistake, and also some of them who are specifying cement. It would also be difficult to make this division as Mr. Randall suggests, with sand, for the reason that the sand fills up the space between the two bricks; and I do not believe there would be any more room for expansion with the space filled with sand than with cement or tar.

Mr. Cunningham.—I think the noise varies at different times of the year owing to the different expansion of different bodies. At one season the earth will expand more, and the cement will contract or expand differently from the earth, and the brick will be acted upon differently from the cement. I think if the engineers would design their streets so as to allow for this expansion and contraction it would lessen the noise. No doubt you have noticed, in walking over cement sidewalks, you will come across a section that will sound hollow and you walk along and the other section sounds solid. That is due to bad construction. All cement sidewalks should be provided with a certain allowance for expansion and contraction, and if that is not provided you will have a noisy pavement.

Mr. Eudaly.—I believe everyone who has handled cements must know that you can put down cement, or concrete as we speak of it, and let it stand and it will shrink. In many of our pavements they put in the cement or concrete and immediately follow it with sand or brick, and the cement is going to get away from it. I do not want to suggest how long to wait.



E. S. GUNNELL, Chairman Committee on Resolutions,  
Galesburgh Ill.

Suggestions like these are not always to our interests. The sooner we stop discussing this question the better we will be.

Mr. D. V. Purington.—I do not agree that there is anything in this subject that can hurt us. We are after the best pavement and if there is anything that can be brought out by this discussion which will suggest an improvement in the way of avoiding or lessening the sound that is what we want.

Mr. Eudaly.—That is a different thing entirely. And, for fear that I may be misunderstood, I will say that cement will continue to shrink for several weeks. If concrete is allowed to set as it should set to make the best concrete it should have several weeks to do it.

Mr. Chas. A. Bloomfield.—I know that the earth under the sidewalks will absorb moisture and under those circumstances they will expand. Frost and heat do not have the same affect on all substances. You may take that in the case of your watch which you carry in your pocket. There is in that watch a compensating balance composed of two metals; the heat affects one and the frost the other, and they are combined so that in case of either cold weather or warm weather



they will act against each other to prevent contraction and expansion. It is the same way with regard to the earth and other substances. Mr. Ittner is right when he says that the earth under the sidewalk will expand, and it is for the reason that in the fall of the year the earth absorbs moisture and the frost throws it out of line, and it raises the street in the center and produces a hollow space under the pavement.

Mr. O. N. Townsend, Zanesville, O.—After the remarks of Mr. Purington I will give our side. We are contractors as well as manufacturers are interested in having brick pavements used as much as possible. If they are going to make a noise we will not have so many used as if they were not noisy. Our experience is that the square-edge brick pavement does not make as much noise as the round-edge pavement. If brick makers would advocate the use of a filler which is not so rigid we would have less noise, no matter what the foundation is. Sand filling is cheap and not so rigid and with it you will not hear the noise so much. Tar filling is the same thing. When you have a rigid filler like Portland cement you will have the noise whether you use a stone or concrete foundation.

Mr. Purington.—Have you, in Zanesville, two main streets paved with brick, one of which has a sand filler, and the other a cement or tar filler?

Mr. Townsend—Yes sir.

Mr. Purington.—It is that particular case that I had in mind a few minutes since. Some years ago I went to Zanesville and reached the city at two o'clock in the morning. It was in June or July. As we walked along the sidewalk there came along a carriage driven rapidly and I was struck with the metallic ring of the horses feet, or, as Mr. Carson would say "the 'ammer of the 'oofs on the 'ard 'ighway." There was a ring which could be heard for a block. We were not on the street on which the hotel is situated. We went on to the next street and there came along another carriage which made an entirely different noise. There was a dull thud, a sound which we did not hear on the other street and I took occasion the next morning to see what made the difference and the only difference I could see was that one was a sand filler and the other a tar filler.

Mr. L. J. Howard, St. Louis.—I wish to state that these noises on the street is not confined to brick pavements alone. Near my house is a wooden pavement and the street cars run over the wooden pavement and they make so much noise that you cannot hear persons talking ten feet away from you. It sounds like a heavy train of cars running over a bridge.

The President.—The next and last of the topical discussions is 41—"Can a Given Load be Hauled over a Brick Pavement More Easily than Over Asphalt?"

Mr. D. V. Purington.—Mr. D. W. Mead, former engineer of the city of Rockford, and a member of this Association, has published an array of facts bearing on this question; and he places asphalt first and brick second. I take his word for it in preference to my own.

The President.—As the discussion on the topical questions seem to be ended, I will announce the Committee on Statistics and Value of Brick as a Building Material, as follows:

Mr. W. C. Ogden, Birmingham, N. Y., Chairman;

Mr. J. E. Clapp, Vicksburg, Mich.;

Mr. C. L. Merrick, Syracuse, N. Y.

The President.—The next business in order is the Reports of Committees:

The Secretary.—Mr. President and gentlemen of the Association, I beg to offer a communication from the Executive Committee:

#### REPORT OF THE EXECUTIVE COMMITTEE.

Whereas, it is the sense of the Executive Committee of this Association that the work of scientific investigation which was inaugurated at Cleveland in 1895, and which has been pursued at each succeeding convention has become a fixed and vital part of our work, and is necessary to our prosperous existence, and,

Whereas, we believe that the method of prosecution of this

work adopted at Buffalo in 1897, under the Richardson resolution, viz.:—By creation of a scholarship in the Department of Clayworking in the Ohio State University, is the most practical and efficient means of carrying on such work, and also is a valuable aid to this school, for the development and moral support of which this Association stands pledged, therefore, be it resolved,

1st. That we hereby express the fixed intention of maintaining this scholarship, substantially as created, for such a period in the future as our resources permit, and the results of its administration seem to justify.

2d. That to provide for the maintenance of this work, and for the direction of its energies along such lines as are most useful and practically valuable to this Association, that the Committee on Technical Investigation shall become a fixed and permanent committee of this Association, ranking next in importance in our work to the Executive Committee.

3d. That the permanent composition of this body shall be constituted as follows: It shall consist of five members, the Director of the Department of Clayworking in the Ohio State University shall be ex-officio Secretary of the Committee, and shall hold office while he holds his position in the University. The four other members shall be elected each for four-year terms, one being elected by ballot, and the senior being chairman.

4th. That the present membership of the Committee being all appointed at the same date, shall draw lot for seniority, the term of the junior member so determined, shall expire at the Convention of 1899, and that of the others in rotation, the senior member retiring, on the election of his successor in 1902. Vacancies caused by resignation or death, shall be filled by a written ballot of the Association on nomination of a list of five persons by the Executive Committee, and the member elect shall succeed to the junior seat in the Committee.

5th. That the Committee shall be instructed by this convention to open negotiations with the authorities of the University for the continuance of the scholarship on the same terms as those now in force for the school year of 1897-98, and that in event of the successful completion of such negotiations, the Secretary of the Committee shall be authorized to draw on the Secretary of the Association, on or after September 1, 1898, for the sum of \$250 for the maintenance of this scholarship for the year 1898-99.

6th. That the results of the investigations of the present year shall be published in serial form in each issue of the official organ of the Association, as soon as the Secretary of the Committee shall have turned them over to the Secretary of the Association, providing that the publication shall be completed by the close of the year 1898, and that the completed report shall be printed in pamphlet form and issued as a part of the transactions of the Association, by the time of the Annual Convention in February, 1898. The number of the pamphlets to be so issued shall be left in the hands of the Executive Committee, as well as any other questions of this sort not otherwise provided for in the preceding resolutions.

The Secretary.—The present committee by this report is continued for another year. After that one member is to be elected each year by ballot of this Association, so long as the Committee shall continue.

Mr. J. H. Chambers.—I move that the report be received and adopted.

Carried.

Mr. J. W. Tester.—I move that tellers be appointed, and that ballots be prepared, and a drawing take place for the relative positions of the members on that Committee.

Carried.

The President appointed Messrs. Adams and Eudaly tellers. The tellers then proceeded to prepare ballots.

#### MISCELLANEOUS BUSINESS.

The President.—We are now to the matter of miscellaneous business. I understand that the tellers are ready to draw lots for the members of the Commission. The name first announced will be that of the long term member, and so on down the list.

The names were drawn in the following order:

- 1.—D. V. Purington, Chicago.
- 2.—Charles A. Bloomfield, Brooklyn.
- 3.—W. D. Richardson, Shawnee, O.
- 4.—Anthony Ittner, St. Louis.

The following report of the Committee on Resolutions was presented:

#### REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President and Gentlemen: Your Committee on Resolutions desire to submit the following as their report:

During the past year eight of those who had for years been identified as clayworkers, and whose names were on the books of



our Association as active members, have had their names transferred to that list of immortals, whose names will again be called only on that last Great Day. These men were J. W. Penfield, S. K. Fletcher, Otto Giessen, Samuel F. Selden, J. W. Crary, Sr., William E. Sidney, James E. Dingee, and Lewis Oliff, and it would be difficult to select a like number from our membership whose loss to us, and to the communities in which they lived, would be greater. The two first named were charter members of our body, and each and all of them were an honor to our fraternity.

Your committee recommend that this testimonial be spread upon the records of the Association, as a token of our love and respect for these departed friends, and in memory of those sterling virtues which so endeared them to us while living.

Your committee recommend the adoption of the following resolution:

Whereas, Mr. O. L. DeForrest, of Janesville, Wisconsin, has brought to the notice of the National Brick Makers' Association his invention of a wheel track for country roads, utilizing burned clay as the material there; and,

Whereas, this Association is desirous that a practical test of said plan, and a report thereon be made by the Agricultural Department at Washington, in order that the people may become better acquainted with the merits of the wheel track plan of road building and the use for that purpose of vitrified clay, therefore,

Be it resolved, by the said Association assembled in its annual convention at Pittsburgh, Pa., That the Honorable Secretary of Agriculture be and he is hereby earnestly requested to make a practical test of Mr. DeForrest's plan for the improvement of country roads, and publish the results of such test, and be it,

Further resolved, That our secretary be and he is hereby directed to forward a copy hereof to the Honorable Secretary of Agriculture.

Your Committee further recommend the adoption of the following:

"Whereas, An appalling and heartrending calamity has befallen the nation in the destruction of the battleship Maine in the harbor of Havana on the evening of February 15.

Be it resolved, by the National Brick Manufacturers' Association, in convention assembled, in the presence of this awful misfortune; we extend to the survivors and relatives of those who lost their lives our condolence and heartfelt sympathy.

Be it resolved, that it is the further sense of this body that every patriotic instinct and impulse of humanity urges upon us as citizens of this grand Republic to be patient and self-contained until such time as the authorities at Washington shall have fully inquired into and reported the cause of this fearful disaster."

Your Committee also recommend the adoption of the following resolutions:

Resolved, That while it may be necessary in this formal manner to tell the Pittsburgh members of this Association how sincerely we appreciate their efforts, nor to assure them of the very great success which has attended those efforts, yet we wish in this manner to place upon our records a sincere vote of thanks to the Honorable Mayor, and other officials of the City of Pittsburgh.

To the local Association and their ladies,

To the daily press and others who have so generously contributed to render the Twelfth Annual Convention not only one of the most pleasant and enjoyable, but without doubt the most successful convention yet held by the National Brick Manufacturers Association.

Committee.  
E. S. GUNNELL, Chairman.  
CHAS. S. BRAY,  
O. N. TOWNSEND,  
D. P. DeLONG,  
JOHN MILLER,  
E. WEBSTER,  
J. W. CARSON,

Mr. Pike.—I move the adoption of the report as read.

Mr. Adams and Mr. Purington seconded the motion which was adopted unanimously.

The President.—We will now consider the place for the next meeting.

#### WANT THE NEXT CONVENTION.

The Secretary read the following telegram:

"Master Builders' Exchange of Philadelphia sends greeting. Come to Philadelphia next year. Will give you a cordial welcome. WILLIAM HARKNESS, Secretary."

The Secretary read the following invitation from the city of Columbus, Ohio:

To the Officers and Members, National Brick Manufacturers' Association, in Convention Assembled:

Gentlemen—I am authorized by the Directors of the Columbus Board of Trade to extend to you an invitation to hold your next annual Convention in the city of Columbus, Ohio.

I believe it is generally conceded that there is no point in the United States more accessible by rail than the city of Columbus, and from that point of view it is undeniably a desirable place for the meeting of your Association in thus equalizing the time and expenses of delegates.

Should you come to the city, the Board of Trade guarantees to you, without expense, the use of the Columbus Board of Trade auditorium, and any other committee rooms which you might require for the accommodation and convenience of your organization. We can also assure you that the hotel rates will be as reasonable for accommodations furnished as those of any other city. There are also many attractions in and about Columbus that will attract you, and we will be pleased to see that it shall cost you nothing to visit these places.

Very truly yours,

Columbus, O.

JOHN F. OGLEVEE, Secretary.

Prof. Edward Orton, Jr.—I want to second the invitation extended by the Board of Trade of Columbus. I bear from the President of the Ohio State University an invitation for the Association to visit that Institution. I issue from my own department a most heartfelt invitation to the clayworkers to visit that department; and though I am not officially empowered by the clayworkers of Columbus and vicinity to speak for them, I have received statements from all who are in this assemblage at present, and a number who met me before I left Columbus, who asked me to do all that was possible to get the Association to go to Columbus next year. Ohio is the greatest clayworking State in the Union. If you do not believe it, look at the census reports; it has more value in clay products than any other State in the Union; it has a wider range of clay industries than any other State, and leads in more lines than any other clay State in the Union. It has the only Clayworkers school. If you come we will try to make it interesting for you, not only as a good central location for the convention, but a good place to see the various phases of the industry. (Applause.)

The Secretary.—I believe the members will be glad to hear the following telegram:

T. A. Randall, Secretary:

Pressure of business compels my absence. Express regret and kind regards to my fellow brickmakers.

R. B. MORRISON, Rome, Ga.

Secretary Randall also read a telegram from Capt. Grafts acknowledging receipt of Mr. Purington's message, expressing regret at not being able to attend the convention, and extending his congratulations on the success of the meeting.

Mr. Bloomfield.—I move a vote of thanks to the President for the efficient and impartial way in which he has filled the office; to the Secretary for the efficient manner in which he has conducted the work of the Association during the past year, and which led up to this successful convention; and to the retiring officers for the faithful discharge of their respective duties.

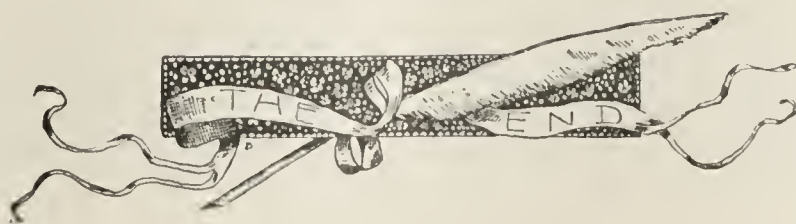
Mr. Bloomfield put the motion, which was carried unanimously by a rising vote.

A member proposed three cheers for the President, which were heartily given.

Mr. Clapp.—I move we do now adjourn.

President Flinn.—Before putting the last motion to be passed by this Convention, I desire to return my sincere thanks for the many acts of kindness I have received at your hands. I came here a stranger to many of you. I have formed many agreeable acquaintances in this convention, which I trust and hope I will be able to keep up for many years to come. I have learned a great deal; and while I have not been able to give all the time to the Convention that I would have desired, I did the best I could, and I will try to do better in the future as the President of this organization. I am surprised at the amount of new matter brought to my notice. In a few days spent at work of this kind, a man is more than compensated, not only in the recreation he enjoys, but in the mass of practical every-day experience brought to his notice. Once again thanking you, I will now put the motion to adjourn. (Applause.)

The motion to adjourn subject to the call of the executive Committee was put and carried.





## THE ANNUAL POWWOW.

## Pittsburg Introduces Some Novel Features — An Unusual Entertainment Enjoyed by the Visiting Brickmakers.

THE INFORMAL reception tendered the members of the N. B. M. A. by the Pittsburg brickmakers proved a decided success. The guests began to gather in the lobbies early and by eight o'clock everybody was ready for the show, which rumor had it was to be something new and novel, and for once, the old dame was correct.

When at 8:30 the doors of the Convention hall were thrown open, and the gentlemen filed in to the lively strains of one of Sousa's best marches rendered by an excellent orchestra, they found that a transformation had taken place. The speaker's platform had disappeared, and in one end of the spacious hall, a little stage had been erected, with all the paraphernalia, including footlights, scenery, etc., necessary for a regular theatrical performance. The seating capacity of the hall was soon exhausted and the regulation placard "standing room only" that appears on the outside door of a crowded house, might appropriately have been displayed.

President Flinn looked into the faces of an attentive audience when he called for order.

President Flinn.—Gentlemen, this is, to a certain extent, an extra, hardly well defined on the programme, and I would suggest that we take as Master of Ceremonies for the evening our mutual friend Col. E. C. McGraw. I am a young man in my acquaintance with this organization, and I understood there was some man here known by the title of the "Four-Year-Old," and after inquiry I found it was our friend McGraw; and I have the pleasure and honor of introducing the gentleman known as the "Four-Year-Old." (Applause.)

A voice.—What's the matter with McGraw.

Many voices answered "He's all right," with one accord and so vociferously that it seemed it might be heard a block away.

Mr. McGraw.—Mr. President and Gentlemen—This is rather against my inclinations. However, as I have been requested to serve as Master of Ceremonies, I will fill the office as well as I can. I did desire to say a few words, but presume that would now be out of place, so I will call for the first speaker of the evening, Mr. A. C. Robinson, of Pittsburg to bid you welcome and tell you how glad we are to have you with us.

## MR. ROBINSON'S ADDRESS.

Mr. President, Mr. Master of Ceremonies, and Gentlemen: I have been known all over this section of the country as quite an orator. I am going to tell you that before I begin, because after I close my remarks, you won't think so. The reason for that is that this is the only time in my life that I have not been prepared with a speech before hand. As a rule all orators, you know, are supposed to speak extemporaneously; as a fact they don't. These are state secrets I am telling you now. They have speeches prepared in such manner that they can change them to anything that is wanted, you know. I never knew but one orator in my life equal to making an extemporaneous speech, a truly extemporaneous speech, and that was the Hon. Emory Storrs, of Chicago, and he was tested just as I am being tested to-night at a meeting in St. Louis, probably of a similar character to this. He was called upon, not knowing what he had to talk about, and no indication of what it should be; and they asked him to make a speech, and gave him as a subject—Water. I could make a speech on water myself, because I think a great deal about it. I do not know of any persons in the world who ought to be more interested in a talk on the subject of water than brickmakers, because they have more water in their brick, brick is a great absorber, but there is also a large amount in the man who makes the brick. He takes his water on the side. He could not possibly do anything else. Now, what am I here for? What am I to do or say? I repeat what am I here for? (A voice—"Water.") Get that outside.

I forget what I am to talk about. If anyone will give me a subject, I will talk about it; if you won't do that, I suppose I have to say something. As I understand it, the gentlemen

assembled here to-night are the representative brickmakers of America. There is no doubt but you have made many a brick in your time, and these bricks have been placed in positions that have made many homes. I own a brick house myself. That is, I think I own it, but the fellow who has the mortgage thinks he owns it, too. Nevertheless, I am living in it. Now, then, it seems to me that you gentlemen have a great responsibility on you, and I have no doubt that your meeting in this community to-day is for the purpose of bettering the condition of the manufacturer of brick, or improving your brick or your purse, either one way or the other! I don't know whether it is the purse of the quality of the brick. No doubt, you are willing to make better brick if you can get a better price. Now, if that be true, there are some things in my mind, which I desire to say to you, and which may show you how to do it. An aggregation of men such as is here to-night means something more than a congregation of individuals. You are meeting for purposes of your own—for personal interest; your interests maybe, or the interest of some one else. What you want to do is to get the best you can out of what you are actively engaged in. Now do you do that? Have you come together in an Association that means what? What does it mean? It means that you have virtually associated yourselves for the purpose of bettering your condition, for the purpose, perhaps, of getting a little more out of bricks than you get at the present time, and you ought to get it. You cannot afford to make bricks unless there is something in return for it. That being the case it is for you to do what you ought to do to get the best end of it. It seems to me I see asserted here one particular principle, and that is one of the ideas that permeates this entire country to-day, and one of the ideas my friend, Senator Flinn, is thoroughly saturated with, and when I mention the word he will know what it is—it is organization. He is full of it. While his organization I have reference to is outside of the brickmaker's association, nevertheless it is in an industrial position. His organization is outside of brickmaking. I do not know whether he pays as much attention to that line as he does to politics. That I cannot tell you. I get my inspiration from that broad idea. I say if it is a good thing in politics, it must be a good thing for a brickmaker to be up against. If you have an organization, what is it for? It is for the betterment of your own condition. Every man lives with that idea, no matter who he is. We live in an entirely different atmosphere to-day from what they have done in the past. If you take the history of the world and look at it for a moment, what do you find? You find three conditions. You first find men in an abject condition of slavery, you find one man owning not only the property, but the man, and after a while, as time passes, there is an evolution, and that brings another condition, the freedom of mankind, throughout the world! and still another condition brought the conflict that exists between man and man, the conflict of existence in itself. Now that conflict has gone on year after year, and what is the result? We have come to the trade is a failure, and instead of being the life of trade it is conclusion that the old adage that "Competition is the life of the damnation of trade in a sense. Now, to get away from that particular competition that exists for you, what do you do? You come together and organize for the purpose of trade, and control the very thing that has been doing you an injury, and by the controlling of that particular factor you benefit yourself. When you benefit yourself, I believe, in a sense that you benefit all concerned. I am not a believer in the principle that organization of bodies of capital, no matter what sphere of life they may affect, are a detriment to the interests of the community. I believe when one man makes money another man will get the benefit of it. If you have money you spend it and the next man gets the benefit. I say that there is not anything in the world that is better for the interests of the brickmakers of the country than organization. (Applause.) Organization in my judgment is one of the greatest things we have to-day in this country or any other. If the golden rule was the general rule which permeated society, of course, this need not be; but we have to accept conditions as they are. The man who raises the price of bread is a man who ought not to have the good will of the community, because that is something which is the staff of life and it should be kept at the lowest ebb. A brick house is a different thing. A man who builds a house has a surplus, because if he has not a surplus he cannot build a house; and a fellow who has a surplus ought to pay for the building of the house and the man who makes the brick ought to get the benefit of the demand for that brick. (Applause.)

Master of Ceremonies.—The speaker referred to a famous Chicago man, an after-dinner speaker, which reminds me that we have amongst us to-night, not merely an after-dinner speaker, but a man whose fame has extended far and wide, not only as an orator, but a lecturer and demonstrator. We



are fortunate in having him with us to-night. I have reference to Mr. D. V. Purington. (Applause.)

#### MR. PURINGTON AS A LECTURER.

Mr. Purington.—Just as I came in the door, Mr. Randall said to me that Mr. Robinson had alluded to Emory Storrs, as one of the extemporaneous speakers of his time. I want to tell a little story of which I am minded by what Mr. Randall said. During the convention that finally nominated Blaine and Logan, in Chicago, I remember being near the Massachusetts delegation one morning, when Mr. Storrs came in, and I was well acquainted with the delegation and Mr. Storrs, and he was evidently looking for somebody, and I said "Are you acquainted with these gentlemen, Mr. Storrs?" He said, "No;" and I introduced him. I asked him who he was shouting for, and he said "Arthur, Sir; for Logan, not at all, and I should look upon the nomination of James G. Blaine, as a calamity to the people." What was my astonishment, the night after the nomination was made, to hear Mr. Storrs make one of the most magnificent speeches of his life, ratifying the nomination of Blaine and Logan.

I think it is universally conceded that Emory Storrs rarely made one of those speeches for which he was so famous without giving it a great deal of preparation. As an extemporaneous speaker Mr. Storrs was not a success, but that he made grand speeches all admit, and he had a knack of adapting himself to circumstances. I was introduced as a lecturer and demonstrator. I never even dreamed of making a lecture. But I have been thinking, as I look over this audience that the members of the National Association of Brickmakers are to be congratulated on the progress they are making and the success of the organization. I do not think any convention—and I have attended every one of them and every session since the organization at Cincinnati twelve years ago—and I do not think any first session was equal to our first session here in interest and attendance. The first session of this convention at Cincinnati was a peculiar one for those who were there to remember it. There were not over forty of us; about thirty who came together from different parts of the country, in response to the call in the "Clay-Worker," and all feeling the necessity of such an organization. We had our papers and the first evening Mr. Eudaly, or some one else, invited the boys to go over the Rhine with him, and for one I did not go. I did not know what over the Rhine was. (Cries of "We all know.") I spent the evening with brother Brown, State Geologist, of Indianapolis, at the hotel. It seemed to me I had met a man who knew more than I did, and I felt it my duty to learn all I could. I apply my pump at every convention and get what information I can, and make it my business to go home from every one of these conventions wiser than I came. I believe that most of us who take an interest in the Convention, and appreciate the reasons for which we come here, feels when he goes away very much as I do.

The second convention we had was held in Chicago. There we had an attendance of probably three times that of Cincinnati, and the interest in the Association began to develop. It was there that Mr. Eudaly made his celebrated speech on the units of heat. If you go back to the "Clay-Worker" of that time you will find that it was the first time we heard of it as applied to brickmaking, and we have since learned that there was a good deal in the theory, and which we have been obliged to put in practice and learn something about. The next convention was at Memphis. There the town was painted a little bit. The boys let themselves out in Memphis and Memphis let itself out. There are some things I remember in connection with that meeting. I have reached the garrulous age when reminiscences are my stock in trade. There were one or two funny things which happened there, and among them was a ready reply made by Prof. Elsom to Capt. Crafts. Elsom had read a long paper on the efflorescence of brick, and went into the subject scientifically and chemically, and told us what the efflorescence consisted of, how it destroyed the usefulness and appearance of the brick, and altogether it was a well written and well read paper. After he had finished and the applause subsided, Capt. Crafts got up and said—"Well, we have listened to this paper, which told us a great deal about efflorescence. It tells us all about its formation, and all that; but what I want to know is how to prevent it. Whether Elsom was prepared for a question of that kind, I do not know; but what I want to know is how to prevent it." Whether that I can answer that question any better than by relating a little story"—by the way, the night before we had a magnificent banquet and a rattling good time. He said—"There was a good old deacon from Connecticut in a Southern city, attending a brickmakers' convention, and he went to a banquet and had a lively time; he got through late and found his way to his room, took off his dress suit, folded it up carefully and put it in bed and hung himself on the back of a chair and went to sleep; he dreamed that he had about such an

experience as he had and had awakened from his sleep and found his clothes gone, his hat gone and his money gone and could not find a friend in the hotel, who had seen or heard of him. He sneaked out of the hotel without paying his bill, and found that nothing was to be done but to get back to the Nutmeg State as soon as he could. He started to walk, and nearing the close of the first day's travelling, with a long range of hills in the distance, he came upon his enemy, the Devil. Satan said, 'Good evening, Deacon.' The deacon said, 'Good evening, Satan.' Satan said, 'I am going to ask you once more to enter my service. I have waited a long while and want you, and must have you.' After bantering some time, finally the deacon said, 'I'll tell you what I will do; if you will do three things I will ask of you, I will enter your service.' Satan said, 'All right. What is the first one?' The deacon was leaning against a large tree and he said, 'I would like you to pull up that tree by the roots.' Up came the tree by the roots. The deacon began to look afraid, and Satan said, 'The next one.' The deacon, looking at the long range of hills before him, said, 'I would like that range of hills leveled;' and in the twinkling of an eye they settled down. 'Well, deacon, what's the next one?' The deacon was somewhat puzzled at first, but remembering the difficulty he had at home year after year with architects and builders on account of salt-



EDWIN MCGRAW, Master of Ceremonies of Powwow Pittsburg, Pa.

peter coming out on the bricks, he said, 'Tell me how to prevent efflorescence coming out on a brick,' and the devil hung his head and went his way." (Laughter and applause.)

Then there was another amusing experience at that convention. We had another brickmaker from Massachusetts by the name of Smith. He was a natural orator, like Jesse Adams. It came to the last session of the convention, when the resolutions had been read, and we were ready to adjourn, and Smith came and said "Are you going to adjourn?" We said, "Yes, we are going to adjourn; we are all through." He said, "I have not had a chance to speak." We let him go on and speak, and he spoke for nearly two hours. He got himself wound up, and went until he run down. The next convention was at Philadelphia. There was nothing very particular about Philadelphia, except brother McAvoy's speech, when he was elected chairman, and he could not remember a word of it. It came to him after a time, but for a minute he was off his reckoning entirely. He got going and caught the words he had committed to memory, and everything went all right. From Philadelphia we went to Indianapolis, then Washington and Louisville. Louisville was another of those towns we painted red before we got through. I do not know whether it has regained its natural somberness yet; but we had a good time there. The following year we went to Chicago. I haven't anything to say about that convention, except that I



had a good time. And then we went to Cleveland and so on, and in all these different places, like a rolling stone, we have gathered moss and gathered friends and gained friends, and added to the number of warm friendships spoken of to-day until they reach in the hundreds. Each member can name almost one hundred warm friends in this Association, with whom he is connected by a tie of friendship that will last. My friends in this Association I count as my warmest and closest and dearest.

I had a little plan, which I have been unable to carry out—but I am going to be honest and confess my failure and show you how much of a failure it is, because it is pretty bad. My plan was this—in looking over old numbers of the trade journals, in which were portraits of our members, it was interesting to note what changes the past twelve years had made. For instance, Mr. Randall, when he began, had a full head of hair. He gets full now sometimes, but the hair is scarce.

Brother Pike has lost some of his hair too, since our early conventions. While we have gained in years and experience, we have, some of us, lost in good looks. Intending to illustrate this, I had an artist prepare a series of portraits, but the results are not satisfactory to me, so I shall not use them as I had intended to illustrate the changes that are taking place among our older members. Had the artist been able to delineate the facial expressions, my intended lecture would have been amusing, at least.

In spite of Mr. Purington's protest, Mr. Randall produced the drawings referred to and exhibited them to the audience. They were caricatures and caused much merriment. Continuing Mr. Purington said:

Mr. Chairman, I had no idea that this thing was in store for me; but I am very glad to have been here even for these few minutes and to have a position where I can look into the faces of all the gentlemen who are attending this convention. This is the twelfth pow-wow or entertainment that I have attended, and I expect to attend just twelve more of the annual gatherings. (Applause.)

Master of Ceremonies.—I beg to announce that this is the end of the speech-making. We are about to adjourn to the dining-room, where luncheon will be served. Then we will re-assemble in this hall. We have erected this cute little stage. We shall have three acts from the leading vaudeville company of the world. On this stage will be introduced Mr. Eddie Evans and wife, in a juvenile character sketch. This will be followed by a sketch by Mr. Charles Sweet, and then Messrs. McIntyre & Heath will entertain you. The entertainment will last about an hour and a half, from half past ten to twelve o'clock. (Applause.)

Following the lead of the Toastmaster and President Flinn, the members made their way to the dining room, where a sumptuous spread was waiting; extending the full length of

the room were tables laden with choice meats and viands, dainty knick knacks, luscious fruits and flowers. It was indeed a pretty picture—a tempting spread, which the guests took to very cordially. After they had dallied with it an hour, the picture was somewhat disfigured, but everybody was in good humor to enjoy the balance of the entertainment. The music of the orchestra and the announcement that the performance would soon begin caused an exodus from the dining hall to the audience room. So anxious were all to see the show, that even the punch bowls in the hall way that had previously seemed so tempting were passed by.

When all were seated, Toastmaster McGraw announced that a few remarks from C. McDermott, Wellington, O., the songwriter of the Association, were in order. Mr. McDermott expressed surprise at being called upon so unexpectedly, but said he was glad to have an opportunity to register a few "kicks" he had coming him, against the Secretary, and launched forth in a very vigorous strain, but had hardly got well started when the irrepressible Flood interrupted by one of his characteristic side remarks, which provoked roars of laughter. Before McDermott could recover, Secretary Randall got the floor and stated that while he did not think much of McDermott as an orator, he had to admit that he was a great singer, and calling up Matson, Stiles, Pike and Merwin, the "Vaseline Quartette," they all joined in singing a parody on "There'll Be a Hot Time in The Old Town To night," the words of which are given on page 158. It is needless to say a number of encores were demanded.

When quiet was restored, Toastmaster McGraw gave the word, the orchestra resumed operations, and Edward and Josie Evans, juvenile impersonators of the Hyde & Behman Vaudeville Co., did a turn that met with vociferous approval. They were followed by Chas. Sweet, the tramp pianist who gave his inimitable and entertaining musical sketch, than which nothing could have pleased the audience more. He in turn was followed by McIntyre & Heath, negro delineators, in an old-time minstrel act, which carried the older members back to their boyhood days, when negro minstrelsy was in high favor.

The performance was thoroughly enjoyed by every one. We have never seen a more contented or satisfied audience leave an amusement hall. The punch bowls were surrounded, and many toasts were drank to McGraw, Flinn, Dibert, Cawley, Albertson, McLaren, Wittmer, and all the Pittsburg brethren, who had so generously provided for the comfort and happiness of their guests.

## LIST OF MEMBERS N. B. M. A., 1898.

Chattahoochee Brick Co., Atlanta, Ga.  
W. D. Palmer, Atlanta, Ga.  
W. E. McCoy, Augusta, Ga.  
Alton Paving, Building and Fire Brick Co.,  
Alton, Ill.  
Woolley Foundry and Machine Works, Anderson, Ind.  
Anderson Foundry and Machine Works,  
Anderson, Ind.  
Geo. M. Stedman, Aurora, Ind.  
Newton & Co. (Inc.), Albany, N. Y.  
Chas. T. Harris, Alfred Center, N. Y.  
D. S. Hildebrand, Asheville, N. C.  
H. B. Manton, Akron, O.  
D. C. Cawley, Allegheny, Pa.  
Xavier Wittmer, Allegheny, Pa.  
C. H. Yohe, Alexandria, Va.  
W. H. Carter, Appleton, Wis.  
W. F. Tallman, Beamsville, Can.  
M. E. Jacobs, Berlin, Conn.  
Donnelly Brick Co., Berlin, Conn.  
W. L. Davis, Berlin, Conn.  
Geo. H. Drew, Blue Island, Ill.  
S. H. Alsip, Belleville Ill.  
O. W. Dunlap, Bloomington, Ill.  
Wm. Garig, Baton Rouge, La.  
Chas. H. Classen, Baltimore, Md.

F. & A. Wehr, Baltimore, Md.  
Baltimore High Grade Brick Co., Baltimore, Md.  
Jacob Klein, Baltimore, Md.  
C. H. Cromwell, Baltimore, Md.  
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G. R. Twichell & Co., Boston, Mass.  
Edward D. Emerson, Boston, Mass.  
Geo. M. Fiske, Boston, Mass.  
Geo. C. Hicks, Boston, Mass.  
Rogers & Manson, Boston, Mass.  
Philadelphia and Boston Face Brick Co.,  
Boston, Mass.  
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John V. VanPelt, Brooklyn, N. Y.  
Chas. A. Bloomfield, Brooklyn, N. Y.  
Wm. H. Brush, Buffalo, N. Y.  
S. C. Brush, Buffalo, N. Y.  
Frederick W. Haake, Buffalo, N. Y.  
Lewis Kirkover, Buffalo, N. Y.  
Geo. W. Schmidt, Buffalo, N. Y.  
Geo. H. Morton, Buffalo, N. Y.  
Hector McLean, Bridgetown, N. S.  
Geo. H. Bruns, Brecon, O.  
W. W. Rcehl, Bucyrus, O.  
L. P. Battiefeld, Bucyrus, O.

A. R. Batley, Bucyrus, O.  
Richard R. Hice, Beaver, Pa.  
Reese, Hammond & Co., Bolivar, Pa.  
Henry T. Wynn, Branch, Pa.  
John W. Sibley, Coaldale, Ala.  
Geo. O. Berry, Columbus, Ga.  
W. D. Gates, Chicago, Ill.  
D. V. Purington, Chicago, Ill.  
B. C. White, Chicago, Ill.  
Harrington & King Perforating Co., Chicago, Ill.  
Lewis Reimer, Chicago, Ill.  
P. L. Simpson, Chicago, Ill.  
John J. Moroney, Chicago, Ill.  
S. S. Kimbell, Chicago, Ill.  
George Lill, Chicago, Ill.  
Geo. H. Hartwell, Chicago, Ill.  
George B. Engle, Jr., Chicago, Ill.  
H. J. Flood, Chicago, Ill.  
J. E. Eastes, Chicago, Ill.  
S. S. Chisholm, Chicago, Ill.  
Geo. J. M. Ashby, Chicago, Ill.  
Herman Thurow, Chicago, Ill.  
Tiffany Enameled Brick Co., Chicago, Ill.  
W. H. Alsip, Chicago, Ill.  
Hayt & Alsip, Chicago, Ill.  
A. F. Barron (Wolff Dryer Co.), Chicago, Ill.



W. L. Jacoby (Latrobe Steel Co.), Chicago, Ill.  
 Chas. Bonner, Chicago, Ill.  
 F. Lehmann, Chicago, Ill.  
 Geo. J. Walter, Chatsworth, Ill.  
 E. M. Pike, Chenoa, Ill.  
 H. B. Skeele, Chicago Heights, Ill.  
 W. H. Hoagland, Cayuga, Ind.  
 L. C. Besley, Council Bluffs, Ia.  
 Geo. C. Patton, Cloverport, Ky.  
 I. C. Wheeler, Carthage, Mo.  
 Hervey Haigh, Catskill, N. Y.  
 M. E. Gregory, Corning, N. Y.  
 The Bonnot Co., Canton, O.  
 W. E. Keplinger, Canton, O.  
 W. A. Eudaly, Cincinnati, O.  
 Atlas Bolt and Screw Co., Cleveland, O.  
 F. H. Eggers, Cleveland, O.  
 Herbert E. Stone, Cleveland, O.  
 Ohio Ceramic Eng. Co., Cleveland, O.  
 Daniel Duty, Cleveland, O.  
 J. N. Kaufholz, Cleveland, O.  
 A. V. Bleininger, Columbus, O.  
 Prof. Edward Orton, Jr., Columbus, O.  
 L. J. Kilbourne, Columbus, O.  
 C. L. Powell, Columbus, O.  
 J. W. Hornsey, Collinwood, O.  
 C. W. Vaughn, Cuyahoga Falls, O.  
 Chas. P. Speers, Charleroi, Pa.  
 G. A. Guignard, Columbia, S. C.  
 C. W. Williams, Cameron, Tex.  
 M. J. Hynes, Deseronto, Can.  
 John McCain, Denver, Col.  
 Leader M'fg Co., Decatur, Ill.  
 E. D. Mattes, Decatur, Ill.  
 D. H. Heager, Dundee, Ill.  
 Wm. E. McKinney, DeWitt, Ia.  
 A. H. Schmittiel, Detroit, Mich.  
 American Blower Co., Detroit, Mich.  
 Geo. H. Clippert & Bro., Detroit, Mich.  
 C. W. Raymond & Co., Dayton, O.  
 W. C. Denison, Delaware, O.  
 S. A. Williams, Dagscahonda, Pa.  
 W. S. Ravenscroft, Dagscahonda, Pa.  
 Walter E. Hilton, Dunkirk, N. Y.  
 John Hilton, Dunkirk, N. Y.  
 W. H. Bushell, David City, Neb.  
 F. W. M. Hammerschmidt, Elmhurst, Ill.  
 C. G. Reese, Elizabethtown, Pa.  
 Selden Brick Co., Erie, Pa.  
 H. C. Dunn, Erie, Pa.  
 Geo. S. Cox, East Liverpool, O.  
 Wallace M'fg Co., Frankfort, Ind.  
 Ft. Dodge Clay Works, Ft. Dodge, Ia.  
 T. C. Lundy (Garden City Co.), Farmingdale, L. I., N. Y.  
 Edw. Brockway, Fishkill-on-Hudson, N. Y.  
 E. A. Poe, Fayetteville, N. C.  
 L. C. Dinsmore, Fayette City, Pa.  
 R. W. Fredericks, Farrandville, Pa.  
 Franklin Paving Brick Co., Franklin, Pa.  
 R. M. Matson Sons & Co., Fall Creek, Pa.  
 E. S. Gunnell, Galesburg, Ill.  
 Frost M'fg Co., Galesburg, Ill.  
 W. S. Purington, Galesburg, Ill.  
 M. M. Smith, Galesburg, Ill.  
 S. H. McHose, Grinnell, Ia.  
 G. N. Dyer, Gardner, Mass.  
 C. C. Dyer, Greenfield, Mass.  
 A. L. Smith, Greenfield, Mass.  
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 Wm. Finnegan, Green Bay, Wis.  
 Kleymeyer & Klute, Henderson, Ky.  
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 R. G. Eisenhart, Horseheads, N. Y.  
 A. H. Newton, Haverstraw, N. Y.  
 Preston Brick Co., Hornellsville, N. Y.  
 J. W. Jones, Haydenville, O.  
 R. M. Booker, Hampton, Va.  
 F. R. Carter, High Cliff, Wis.  
 T. A. Randall & Co., Indianapolis, Ind.  
 Chandler & Taylor Co., Indianapolis, Ind.  
 W. P. Hussey, Indianapolis, Ind.  
 J. C. Adams, Indianapolis, Ind.  
 John McCay, Indianapolis, Ind.  
 Robt. Elliott, Indianapolis, Ind.  
 C. & A. Potts & Co., Indianapolis, Ind.  
 H. B. Harmon, Iola, Kan.  
 Wm. Cannan, Jamestown, N. Y.  
 J. E. McCusker, Jamestown, N. Y.  
 C. A. Morley, Jamestown, N. Y.  
 Alfred Yates, Johnsonburg, Pa.  
 Jefferson Brick and Tile Co., Jefferson, Wis.  
 John H. Connelly, Kensington, Conn.  
 I. W. Pike, Keyport, N. J.  
 J. M. Leach, Kokomo, Ind.  
 E. W. Thornburn, Kingston, Jamaica.  
 J. W. Barney, Kansas City, Mo.  
 W. T. Hoblitzell, Keystone Junction, Pa.  
 J. W. Carson, LaPrairie, P. Q., Can.  
 LaSalle Pressed Brick Co., LaSalle, Ill.  
 Wm. Hammerschmidt, Lombard, Ill.  
 Geo. T. Howe, Leeds Junction, Me.  
 L. Warstler, Louisville, O.  
 The A. Bonnot M'fg Co., Louisville, O.

Henry Martin Brick Machine M'fg Co., Lancaster, Pa.  
 J. S. McCannell, Milton, Ont., Can.  
 Jas. W. Tester, Montreal, Can.  
 J. W. McMillan, Milledgeville, Ga.  
 Isaac Hardy, Momenca, Ill.  
 Mendota Tile Co., Mendota, Ill.  
 F. T. Melcher, Marion, Ind.  
 F. W. Butterworth, Marion, Ind.  
 Carl F. Kaul, Madison, Neb.  
 R. E. Farnham, Metuchen, N. J.  
 A. E. Burcham, Millville, N. J.  
 Martin L. Griffin, Mechanicsville, N. Y.  
 Mechanicsville Brick Co., Mechanicsville, N. Y.  
 Marion Steam Shovel Co., Marion, O.  
 C. H. Carpenter, Martin's Ferry, O.  
 John J. Bishop, Memphis, Tenn.  
 John P. Cahoon, Murray, Utah.  
 Morgantown Brick Co., Morgantown, W. Va.  
 Menominee Press Brick Co., Menominee, Wis.  
 Ferdinand Vogt, Milwaukee, Wis.  
 David Stephens, Madison, Wis.  
 E. S. Morse, New Britain, Conn.  
 R. Clifford Merwin, New Britain, Conn.  
 R. N. Buell, New Britain, Conn.  
 Frank L. Stiles, North Haven, Conn.  
 S. P. Crafts, New Haven, Conn.  
 H. P. Shares, New Haven, Conn.  
 Ezra D. Fogg, New Haven, Conn.  
 J. Wheaton Stone, New Haven, Conn.  
 H. J. Wiley, New Haven, Conn.  
 J. A. Blaffer, New Orleans, La.  
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 F. H. S. Morrison, New York City, N. Y.  
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 Heinrich Ries, New York City, N. Y.  
 Pfothauer & Nesbit, New York, N. Y.  
 Orrin D. Person, New York City, N. Y.  
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 W. A. Bailey, Northampton, Mass.  
 T. L. Herbert, Nashville, Tenn.  
 Robert Dyas, Nashville, Tenn.  
 A. W. E. Hellyer, Ottawa, Can.  
 C. N. Leathe, Otter River, Mass.  
 W. S. Odell, Ottawa, Can.  
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 J. Fred Smith, Omaha, Neb.  
 Cyrus Chambers, Jr., Overbrook, Pa.  
 R. C. Brown, Oshkosh, Wis.  
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 J. T. Ebert, Palatka, Fla.  
 A. J. Brooker, Porter, Ind.  
 Robt. Nesch, Pittsburg, Kan.  
 James Taylor, Port Monmouth, N. J.  
 A. W. Walton, Princeton, Ill.  
 Henry R. Griffin, Phoenixville, Pa.  
 The Walker-Cook Co., Pierce P. O., O.  
 Horton M'fg Co., Painesville, O.  
 Frank B. McAvoy, Philadelphia, Pa.  
 Thos. H. Flood, Philadelphia, Pa.  
 Wm. Conway, Philadelphia, Pa.  
 J. H. Chambers, Philadelphia, Pa.  
 T. B. McAvoy, Philadelphia, Pa.  
 Wm. McCay, Philadelphia, Pa.  
 E. Webster & Nephew, Philadelphia, Pa.  
 H. C. Dingee, Philadelphia, Pa.  
 Wm. Waplington, Philadelphia, Pa.  
 Geo. W. Sharer, Philadelphia, Pa.  
 D. Charles Murtha, Philadelphia, Pa.  
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 A. A. Hersperger, Pittsburgh, Pa.  
 W. R. Hersperger, Pittsburgh, Pa.  
 Sankey Bros., Pittsburgh, Pa.  
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 J. A. Snell, Providence, R. I.  
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 H. H. McClure, Rome, Ga.  
 Wm. Broadbent, Rome, Ga.  
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 H. A. Block, Rockford, Ill.  
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 C. H. Bradshaw, Ravenna, O.  
 W. H. H. Rogers, Rochester, N. Y.  
 C. A. Shultz, Rondout, N. Y.  
 H. L. Boas, Reading, Pa.  
 Henry Hasbrouck, Ralston, Pa.  
 D. G. Loomis, Sherbrooke, P. Q., Can.  
 W. C. Trotter, St. John, Can.  
 W. B. Lower, Sioux City, Ia.  
 C. J. Holman, Sergeant Bluff, Ia.  
 T. C. Tridell, Streator, Ill.  
 F. Salmen, Slidell, La.  
 Jas. A. Gray, Saco, Me.  
 D. J. Curtis, Springfield, Mass.  
 T. D. Potter, Springfield, Mass.  
 J. S. Sanderson, Springfield, Mass.  
 E. L. Cook, State Farm, Mass.  
 R. L. Jones, Saginaw, East Side, Mich.  
 Anthony Ittner, St. Louis, Mo.  
 F. W. Steinkamper, St. Louis, Mo.  
 M. F. Williams, St. Louis, Mo.  
 L. J. Howard, St. Louis, Mo.  
 J. M. Williams, St. Louis, Mo.  
 H. A. Wheeler, St. Louis, Mo.  
 Sanford E. Loring, Syracuse, N. Y.

James L. Breed, Syracuse, N. Y.  
 H. J. Baldwin, Syracuse, N. Y.  
 Charles H. Merrick, Syracuse, N. Y.  
 D. E. Pidgeon, Salem, O.  
 Crescent M'fg Co., Shonstown, Pa.  
 C. H. Wanner, Sharpsburg, Pa.  
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 W. D. Richardson, Shawnee, O.  
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 J. A. Francis, Shamokin, Pa.  
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 Jos. Russell, Toronto, Can.  
 E. E. Gorton, Terra Cotta, Ills.  
 Chas. W. Hoff, Terre Haute, Ind.  
 A. E. Morrison, Terre Haute, Ind.  
 B. C. Pierce, Taunton, Mass.  
 H. Brewer & Co., Tecumseh, Mich.  
 E. B. Hall, Toledo, Ohio.  
 Walter S. Bowen, Tacoma, Wash.  
 Ellis Lovejoy, Union Furnace, Ohio.  
 John Doyle, Utica, N. Y.  
 J. Edson Clapp, Vicksburg, Mich.  
 Rupright Bros., Van Wert, Ohio.  
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 Washington Brick Co., Washington, D. C.  
 W. A. Richards, Washington, D. C.  
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 F. E. Swift, Washinton, Iowa.  
 F. S. Naugle, Warners, N. Y.  
 Jas. B. Crowell, Walkill, N. Y.  
 Watertown Pressed Brick Co., Watertown, Wis.  
 C. McDermott, Wellington, Ohio.  
 C. G. Stevenson, Wellsville, Ohio.  
 Andrew Branstetter, Wooster, Ohio.  
 A. Thomas, Wickliffe, Ohio.  
 Robt. Twells, Wickliffe, Ohio.  
 Warren Brick Co., Warren, Pa.  
 A. D. Sharples, West Chester, Pa.  
 J. Steele (J. M. Rumbaugh Brick Co.), Wilkinsburg, Pa.  
 A. R. Root, Wilkesbarre, Pa.  
 Geo. T. Dickover, Wilkesbarre, Pa.  
 Geo. B. Waite, Wilkesbarre, Pa.  
 A. A. Wheat, Wheeling, W. Va.  
 T. W. Carmichael, Wellsburg, W. Va.  
 J. P. Norton, York Corner, Me.  
 Zeeland Brick Co., Zeeland, Mich.  
 A. O. Jones, Zanesville, Ohio.  
 The T. B. Townsend Brick & Contracting Co., Zanesville, Ohio.

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1898-9.

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 D. V. PURINGTON (1887), Chicago, Ill.  
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Otto Geissen, Canton, Ohio.  
 S. K. Fletcher, Indianapolis, Ind.  
 Lewis Oliff, Shreveport, La.  
 J. W. Pentfield, Willoughby, Ohio.  
 J. W. Crary, Sr., Bluff Springs, Fla.  
 Samuel Selden, Erie, Pa.  
 W. E. Sidney, Jamestown, N. Y.  
 Jas. E. Dingee, Philadelphia, Pa.



## A NOTED PITTSBURGH FIRM.

## A Mecca for Clayworkers Who Want Clay-Crushing Machinery.



NE OF THE POINTS of interest in the "Brick City" visited by many of the delegates to the recent National Convention was the immense foundry and machine shops of Phillips & McLaren, which is one of the oldest establishments of the kind in the country.

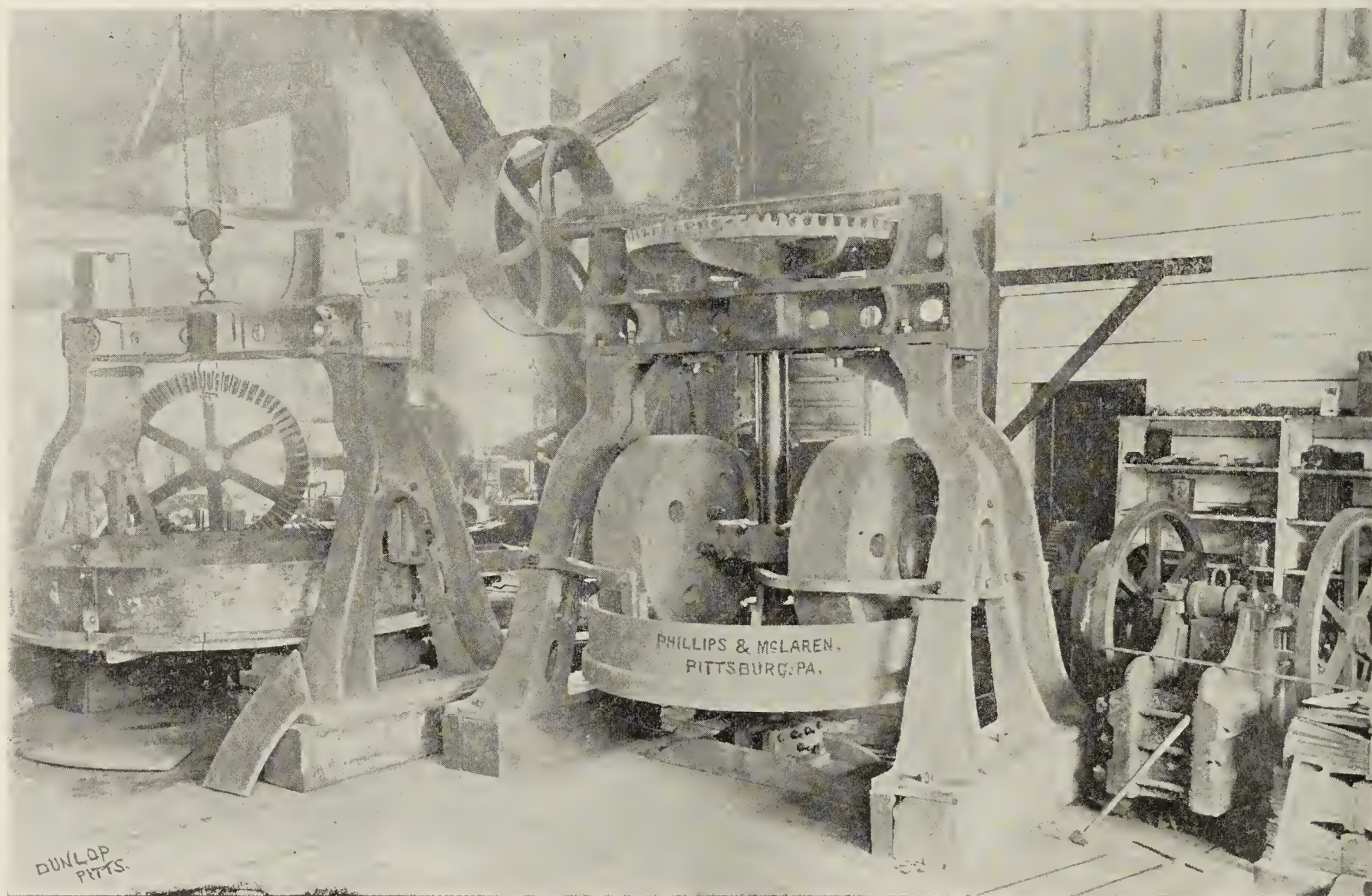
It was first established by Wm. Fisher in 1857 and for many years known as the Fisher Engine, Foundry and Machine Works. The present firm have had entire charge of the business for several years, and under their energetic management are gradually extending their trade throughout the country.

On page 47 of the January Clay-Worker we gave a view of

Their pans are now in general use for crushing fire-clay, shale, gravel, limestone, lime, terra cotta, cement, fertilizers and all similar materials. They make both wood and iron-frame pans from four to twelve feet in diameter and for either over or undergear. They request those desiring crushing or pulverizing machinery to write them, stating the kind of clay or material to be ground and capacity required, when they will quote prices and give any desired information at their command. Address Phillips & McLaren, Pittsburg, Pa.

## THE NEBRASKA BRICKMAKERS' CONVENTION.

The third annual convention of the Nebraska Brick Manufacturers' Association was held in the rooms of the Builders' and Traders' Exchange, Omaha, Tuesday and Wednesday, January 25th and 26th. The attendance showed a substantial increase over that of former years, and a number of interesting papers were read, all of which will be given in full in subse-



A Corner in the Erecting Room of Phillips & McLarens Shops, Pittsburgh, Pa.

the interior of a part of their shop which, in connection with the one now presented, will give the reader an idea of the extent and equipment of their works, which are not only extensive, but thoroughly equipped with every modern convenience for handling heavy machinery. Their foundry has great capacity and enables them to turn out castings of a size and quality that ordinary shops could not handle. Their machine shops are equally extensive and well supplied with immense lathes, drills, pneumatic hoists and other aids necessary in handling castings of all sizes, large or small, light or heavy, expeditiously. It is these appliances which enable them to handle their products economically and turn out the best and heaviest of dry pans and wet pans, which are their specialties, at the lowest possible cost. This they say enables them to offer the trade the very best clay-crushing machinery at a moderate price.

quent issues of the Clay-Worker. Secretary Bushell writes that the discussions were lively and instructive, and that all who attended were well pleased. The next Convention will be held at Omaha during the Trans-Mississippi Exposition. A resolution was passed inviting the National Brick Manufacturers' Association to meet there at the same time.

The following officers were elected for the ensuing year: J. Fred Smith, Omaha, President; John Edelmaier, Hooper, First Vice-President; W. N. Horrur, Auburn, Second Vice-President; W. H. Bushell, David City, Secretary, and W. E. Stockwell, Lincoln, Treasurer.

A committee was appointed to confer with the Exposition Commissioners for the purpose of obtaining ample facilities for an extensive display of clayworking machinery and products.





### Convention Echoes.

My Dear Randall: I had hardly time to read my mail, when I received your letter asking for my views on the Convention. When I remembered the doubts you and I had years ago when we first took up the Convention work of the ability of the Association to hold itself together, and when I look back over the wrecks of trade associations started about the same time as ours, I own up to a feeling of pride in the success of the N. B. M. A.

The one thing that now strikes me as the most ominous for good, and on which I congratulate the Association, is the new blood which has been infused into its veins; I feel sure that the verdict of those who were not able to be with us when they have received and read the Clay-Worker will be that it was the best Convention we have ever had. As hosts, the Pittsburg brethren far excelled our anticipations. Without fuss or feathers, without ostentations or ambitious display of their hospitality, their treatment of their guests was ideal.

There is such a difference in hospitality, that when the hosts are so uniformly courteous, so obliging and attentive to their guests, as was the committee of arrangements at Pittsburg, one could not fail to remark it. As a presiding officer Senator Flinn takes the palm, and those of us who felt that Wittmer was the man for President can at least feel that Mr. Wittmer knew what he was talking about when he recommended Mr. Flinn. Altogether, I am happy and am simply continuing the ecstatic condition I was in when I bade you good-bye in the Monongahela.

Fraternally yours,

D. V. PURINGTON.

Chicago, February 21, 1898.

### Impressions Of The Convention By A New Member.

My Dear Mr. Randall: What are my impressions of the late Pittsburg Convention? I wonder if you realized what a reservoir you tapped when you shot this question at "yours truly?"

First and last and best of all, I felt and feel that the day is dawning when the clayworkers will pull together for good, filled with the manly spirit of co-operation, building themselves and their chosen calling up, pushing it forward and onward, instead of pulling apart, filled with envy, jealousy and all uncharitableness by the devilish spirit, or unmanly spirit (if you think the first is too strong a word), of competition—that is to say, illegitimate competition; the kind that pulls down prices, that back-bites the other fellows' stock in trade, which glosses over one's own defective methods and materials and enlarges on the trifling defects of others who are really brothers in trade and whose interest and welfare should be as near and dear to us as our own. This last will be true just in the degree that we bring down into our lives, into our daily work, the spirit of the command, "Thou should love thy neighbor as thyself." Now, who is the clayworker's neighbor in any higher or broader sense than the brother clayworker?

Now, one of many delightful impressions left with me was caused by the feeling that men were capable of making brick to face the walls and pave the muddy ways and streets in this world; to help to make "the crooked straight and the rough places plain," and who could think of "the pavements of gold and walls of jasper" were men who have been cast in the manly mold, that is required to make a co-operative clayworker instead of a competitive clayworker, and that there were many such manly men, and their noble and better halves and "helpmates," gentle and womanly and powerful women in attendance at the Pittsburg Convention. To all of these I send the cordial reminder and heartfelt greeting and trust that they will be glad to learn that they were identified, that their lights were not "put under the bushels," but shone brightly, helpfully and hopefully, revealing their better selves to others. To the one who so kindly suggested to my hesitating self (when at the closing hour of that delightful river excursion I was asked to sing), that I sing the song "God be with you till we meet again," I must say while it heartily expressed my feelings, felt the occasion deserved just such a song. I was too full, in the sense of being overwhelmed by the good feeling that was about me and bubbling out of everybody, and, therefore, only dared to attempt the next best thing, "Auld Lang Syne." To its wonderful questioning words, "Should old acquaintances be forgot,"

I'll answer in the word of the "jolly good song, jolly well sung," "nit."

For myself, I am sure the acquaintances, old and new, made and met on this occasion, I shall not forget, and with your help I'll hereby send them all the hearty greetings of the song I could, but did not dare to sing. "God be with you till we meet again," and prosper the good work in which you are so helpfully and hopefully working.

Sincerely yours,

Pittsburg, February 19, 1898.

SANFORD E. LORING.

### The Last The Best Of All.

Editor Clay-Worker:

Another annual Convention of the National Brickmakers' Association has come and passed into history. Its tale of kindly greeting, friendly companionship, mutual instructive encouragement and its inevitable but hopeful good-bye has been told; but its good work is not yet done, nor will it be completed until we pass over to join that silent majority, which has claimed and taken eight of our number since our eleventh Convention.

The immense force of mutual helpfulness and instruction that was concentrated at this time and has gone forth from our gathering at Pittsburg will roll on and on like the swell of a tidal wave, covering the land from the Atlantic to the Pacific, and from Canada to the Gulf, reaching in its way the brickyard and market of every brickmaker who has eyes to see and ears to hear and a willingness to learn.

Happy are we who were there to see and hear and learn, and fortunate are they who though absent can yet see and read in the published records the wise words of experience and suggestion and counsel, which were so fraternally spoken from the generous hearts and accumulated knowledge of the assembled brickmakers.

One grand keynote was struck at the second session, and its echoes reverberated all through the following sessions. It was this: "Why do not the people buy our product; how can we extend our markets?"

These are the most important questions which confronts the brickmaker. Why are houses built of wood? Why are roads made of mud? Why are so many lives and so much property sacrificed every year in wooden shells, miscalled hotels? Brickmakers! whose fault is it? Who shall preach the gospel of safe brick structure if we do not?

Let every brickmaker seriously consider this question and every one will doubtless find it sufficient reason. Let us one and all do our part to help in the extension of our own markets; that is, to enlarge the demand for our own goods; find new uses and outlets for burned clay, and then write to the Clay-Worker and tell his brethren how he thinks the good work can be pushed forward.

There were two good resolutions offered in the meeting in regard to this matter, one by Mr. Ogden and one by W. D. Gates. The motion by Mr. Ogden, relating only to brick houses, was carried; but it will be a misfortune if the far more comprehensive motion of Mr. Gates does not go upon the records, so that every brickmaker can read it and see for himself whether or no it does not suggest to him some opportunity for special effort to extend the use of burned clay product in our public buildings and improvements as well as for private buildings.

Herein shall we surely find the remedy for our doleful cry of "over-production," viz., increased consumption.

It was a great revival; the Philadelphia Big Four has lost one more of its number, James E. Dingee, but the twins, McAvoy and Flood, are still with us.

Our jolly old nutmeg-grater, Capt. Crafts, was not visible, but we had a telegram which told us that his good-will and kindly thoughts had been sent along. We missed his shining dome, and our good friend Pike seemed lonesome, as he had to take from Gates and Eudaly the portion of bald jokes which were heretofore shared equally between Pike and Crafts.

Though somewhat saddened by the absence of a few, we were delighted to once again clasp hands, receive welcome and pleasant words, and to hear of cheerful hopes from so many of those who have borne the heat and burden of the early struggles of our Association.

To see Adams, Purington, Ittner, Eudaly, McAvoy, Eggers, Gates, Pike and other old war horses assembled in council was a goodly sight, and to meet again the perennial and ever-blooming Secretary, whose cheerful industry and persistence in seeking to advance the welfare and comfort of every member of our Association is one of the chief strands in the cord which binds us clayworkers together in a brotherhood that is hard to beat, was a real pleasure.

Now, I must stop for want of space. There is much more to tell; perhaps others may say the things which I have left unsaid.

JAMES TAYLOR.

Port Monmouth, February 21, 1898.



## FRIDAY'S EXCURSION.

WHILE the visitors were royally entertained throughout the week, being kept on the go from the hour of their arrival up to the time of their departure from the Brick City, the grand finale which occurred Friday was a fitting culmination of a splendid exhibition of hospitality, that will make Pittsburg a pleasant memory for years to come in the minds of all who participated. The day broke lowery. The local committee had hoped and prayed for a pleasant day, but the weather man gainsaid it and sent rain, but it takes more than rain to dampen the ardor of the members of the N. B. M. A., when on pleasure bent; when they start out for a holiday, they carry out the programme to the letter, rain or shine; so it was at Pittsburg.

It was a jovial party that a little before eleven o'clock wended its way down the levee and boarded the steamer Elizabeth, a plain but staunch little craft, that was moored within a stone's throw of the Monongahela House. No sooner were all on board, than she steamed away and the music began. The younger members of the party soon lost interest in the scenery, which was outlined dimly against a background of fog, cleared the center of the cabin and began tripping the light fantastic. It was a pretty diversion, and a number of the older members were inveigled into an exhibition of their skill. The writer will not soon forget the living picture presented by McDermott as he waltzed a fair partner to the tune of "After the Ball." Mac can dance just as well as he can sing, and that is no mean compliment.

Extending along one side of the long cabin were tables prettily decorated with flowers and substantial for the inner man, while on the deck below dusky waiters served liquid refreshments to all who were athirst—and it kept them busy. The members of the Entertainment Committee were in their glory, and made it their business to see that each and every guest was supplied with whatever the boat afforded, and that was everything desirable for such an occasion, including an unlimited supply of Pittsburg stogies.

The boat ride up and down the river was thoroughly enjoyed by all. The trip through the Lock was a revelation to those from inland points, many of whom had never before seen a boat climb a hill.

At Homestead a stop was made and the entire party marched through a part of the great Carnegie Steel Works, guided by uniformed officers, detailed for that special duty, and viewed with undisguised wonder the various operations incident to the melting, casting and rolling of great masses of metal. Those who have not witnessed such work cannot imagine the ease with which great blocks of red-hot iron, weighing many tons, are carried about mechanically and molded and rolled into immense tubes or flattened into great sheets, and while at almost a white heat, drawn and cut into various forms and sizes, as easily as a candy puller handles a wad of taffy. For two hours we were led about the plant, which covers many acres, and returned to the boat tired of limb, but light of heart. Another onslaught was made on the refreshments, after which all hands gathered in the cabin, and listened to a number of short, appropriate speeches. Mr. Eudaly acted as orator in chief, and in his own inimitable way introduced one speaker after another in a manner which provoked much merriment. Secretary Randall was the first victim, and was followed by Adams, Richardson, Brush, Bloomfield, Stiles, Morse and others; each in turn paid tribute to the brickmakers of Pittsburg and their wives for the splendid entertainment they had afforded the visitors. Mrs. Anthony Ittner was called upon and spoke briefly but touchingly in behalf of the visiting ladies. Mrs. Randall was also called upon, but begged to be excused, saying she could not do justice to the occasion. The local committee had their inning, too; Wittner, McGraw, Dibert, Albertson and McLaren spoke of the pleasure it afforded them and their associates to welcome the members of the N. B. M. A. to Pittsburg and expressed the wish that all might enjoy themselves to an extent that would make them want to come again, which sentiment was roundly cheered.

Sandwiched in between the speeches were songs by the "Vaseline" sextette, whose efforts were loudly applauded, and were well seconded by Mr. Loring, who lead in "Auld Lang Syne." McDermott and Randall's duet, "I Was Never so Surprised in all My Life," made a hit, and Matson's "Hot Time" melted all the ice in the cooler. With so much "talent" aboard,

it is little wonder that the trip back seemed very short. Truly, the excursion was a "howling success." To one and all it was an occasion of unalloyed pleasure.

## THE MACHINERY ANNEX.

THE exhibition room was the scene of much activity throughout the Convention. It was well located, being next to the main entrance to the hotel and, though not so large as could be desired, answered the purpose very well. Upon tables arranged about the four sides of the room and another extending through the center were specimen brick, models of machinery and printed matter telling graphically the merits of various processes and devices designed to produce more and better ware than may be produced by old-time methods.

One of the most elaborate and carefully-arranged exhibits was that of Kendall & Flick, the well-known manganese producers whose office is at Washington, D. C., and whose mines and works are near Elkton, Va. Mr. Kendall is largely interested in other concerns besides Kendall & Flick, and in addition is in the business of selling metals, contracting for Government supplies, etc., at Washington, but who has evidently found time enough in addition to his other cares to thoroughly post himself on manganese, its uses in clayworking and how to use it. The exhibit of Kendall & Flick contained a full line of samples of their different sizes and sorts of manganese suitable for the clayworker, and also a number of extremely fine samples of the results of the use of their material. They had on view brick, terra cotta and tile from the Washington Hydraulic Pressed Brick Co., Fiske, Homes & Co., M. E. Gregory, the Garden City Co., Celladon Tile Works and others. Kendall & Flick are actual producers of manganese. They mine, wash and prepare the ore for every purpose, constantly watching the quality by careful analysis, make a very large variety of sizes, especially for the clayworkers, and, as Mr. Kendall puts it, "We are here to suit you, and if we don't make the size you want regularly we will do it special, with no extra charge." They gave away pocket wallets containing a copy of Mr. Taylor's book, written especially for them on "Manganese and Its Uses and How to Use It." Also their own unique booklet describing their wares.

Chambers Bros.' Co., Philadelphia, displayed a number of photographs of their brick machines, and a line of wire-cut brick, and distributed the most attractive bit of trade literature that came to our notice. It was gotten up especially for the occasion and is odd in conception and execution, being a 36-page book, pocket-size (4x7½ inches). On the front cover is a pretty half-tone in four colors, representing a group of summer girls coasting on a bicycle built for four. Beneath is the suggestive title, "Pick One." Between the covers is found the Convention programme, cuts of some of Chambers' latest inventions, including a brand new automatic side-cut table and a charmingly-illustrated version of Gates' Bird Story, deftly enlarged upon to suit the purpose. Among the illustrations is a fine portrait of Gates labeled "The Narrator, King of Button-Holers." Considering that the book is issued as an ad., it is a gem.

The Standard Dry Kiln Co., Indianapolis, Ind., passed round a new booklet, telling all about "A Drier that Makes Money." If there is anything in a name, it ought to be just what brick-makers are looking for.

The Chicago Brick Machinery Co. was represented by the redoubtable John Moroney—he of the auburn locks. He was on the ground early and staid late. He and his nickel-plated model of the new Berg brick press were greatly admired by all comers. The press presents a fine appearance, as may be seen by turning to page 176. John says it is just as good as it looks, and is destined to fill a long-felt want on many brickyards.

The noisiest display in the room was that presided over by P. L. Simpson, Chicago, and comprised a number of small working models operated by electricity. The novel movements of the screens, conveyors, an oscillating clay-crusher, upright separator and pulverizer attracted so much attention that it



was hard to get past the exhibit. At least, we always found a crowd gathered about it whenever we looked into the "Annex."

The Atlas Bolt and Screw Co., Cleveland, Ohio, was very much in evidence. Affable S. D. Wright, as energetic as he is handsome, lost no opportunity of reminding the brickmakers that they offered a full line of brick cars, turn-tables, dumping clay cars, etc. He added a picturesque feature to Friday's trip by pinning gay-colored pen-wipers to the lapel of many of those on board the steamer.

The Ohio Ceramic and Engineering Co.'s representative distributed leaflets, telling all about the Richardson's double-pressure repress and a watersmoking thermometer for measuring temperatures up to 600 degrees Fahr.

Little Big Davis Brown, with E. D. Mattes, of Decatur, industriously made known the merits of the Leader brick repress and other clayworking machinery. It is seldom anything gets away from Davis.

H. J. Flood, the newly-elected president of the Chisholm, Boyd & White Co., Chicago, was conspicuously modest, and his recently-acquired honors sat lightly upon him. He contented himself with extending a kindly greeting and a neat eight-page circular telling of the Boyd press and Flood kilns to all who came his way.

Albert Potts, of C. & A. Potts & Co., Indianapolis, displayed some photos of their machinery and incidentally handed out a neat little brochure, novel, because it contained not a single illustration, describing their horizontal stock brick machines and other brickyard supplies.

M. F. Williams, of St. Louis, welcomed all comers heartily, and distributed generously cards and pamphlets giving desirable information about the Williams improved pulverizer and disintegrator.

W. H. Shoemaker, representing the Main Belting Co., Chicago, passed around a substantial memorandum book, by which he hoped to remind brickmakers that nothing in the way of belts is equal to the Leviathan for brickyard use.

The American Clay-Working Machinery Co., Bucyrus, Ohio, as usual, had several hustlers on the ground, who, under the direction of their genial secretary, W. W. Reehl, lost no opportunity of extending the glad hand to every visitor. They have a line of trade literature that is very hard to beat, and distributed it generously.

There were energetic missionaries representing each of the following firms:

- Wolff Dryer Co., Chicago, Ill.—Brick dryer.
- Chandler & Taylor, Indianapolis, Ind.—Engines and boilers.
- T. W. Carmichael, Wellsburg, W. Va.—Clay steamers.
- Phillips & McLaren, Pittsburg—Dry pans, engines, etc.
- The Frost Engine Co., Galesburg, Ill.—Dry pans, etc.
- Thos. Carlin's Sons, Pittsburg, Pa.—Dry pans, etc.
- Elder & Dunlap, Bloomington, Ill.—Clay screens.
- Pittsburg Mineral Screen Co., Pittsburg, Pa.—Clay screens.
- The Horton Mfg. Co., Painesville, Ohio—Brick machinery.
- The Wellington Machine Co., Wellington, Ohio—Brick machinery.
- The Martin Brick Mach. Mfg. Co., Lancaster, Pa.—Brick machinery.
- Eastern Machinery Co., New Haven, Conn.—Brick machinery.
- Geo. S. Cox, East Liverpool, Ohio—Brick cutting wire.
- The Wallace Mfg. Co., Frankfort, Ind.—Brick and tile machinery.
- C. W. Raymond & Co., Dayton, Ohio—Brick and tile machinery.
- E. M. Freese & Co., Galion, Ohio—Brick and tile machinery.
- Anderson Foundry & Machine Works, Anderson, Ind.—Brick and tile machinery.
- H. Brewer & Co., Tecumseh, Mich.—Brick and tile machinery.
- The A. Bonnot Mfg. Co., Louisville, Ohio—Clayworking machinery.
- Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio—Clayworking machinery.
- The Bonnot Co., Canton, Ohio—Clayworking machinery.
- W. E. Stevenson & Co., Wellsville, Ohio—Clayworking machinery.
- The Marion Steam Shovel Co., Marion, Ohio—Steam shovels and dredges.
- E. M. Pike, Chenoa, Ill.—Brick kilns.
- W. A. Eudaly, Cincinnati, Ohio—Brick kilns.
- S. H. Alsip, Belleville, Ill.—Brick kilns.
- J. W. Carson, La Prairie, P. Q., Canada—Brick kilns.
- Hervey Haigh, Catskill, N. Y.—Brick kilns.
- F. E. Swift, Washington, Iowa—Brick kilns.
- F. Lehman & Co., Chicago, Ill.—Brick kilns.
- Central Machine Works, Cleveland, Ohio—Brick presses, etc.
- A. H. Newton, Haverstraw, N. Y.—Brick mold sander.
- Stedman Foundry & Machine Works, Aurora, Ind.—Clay pulverizers.

## THE CERAMIC ASSOCIATION OF THE OHIO STATE UNIVERSITY.

RETURNING from the National Convention at Pittsburg, Messrs. D. V. Purington and W. D. Gates stopped off at Columbus, Mr. Purington being scheduled to speak before the Ceramic Association Friday, February 18th. Mr. Purington, in his talk, vividly portrayed the situation confronting the young ceramic student, what is expected of him and what he may expect. In warm words of praise he spoke of Prof. Orton, who had not yet returned from the Convention, and of the work done by the ceramic department. Mr. Purington gave his audience kind words of encouragement, which will ever be remembered by the students. At the conclusion of the talk a resolution of thanks was passed.

Mr. Gates followed with an extemporaneous humorous talk.

A debate "Resolved, that the continuous kiln is better than the periodic" was then in order; Mr. L. Barringer for the affirmative, Mr. Purdy, assisted by Mr. Watts, for the negative. Messrs. Purington, Gates and McAllister were appointed judges. Both sides brought out many good points, but the decision was in favor of the affirmative, Mr. Barringer having scored the most points. A discussion of the kiln question was then in order, in which Messrs. Gates and Purington took part. The full text of the latter's address will be given in the Clay-Worker subsequently.

## IMPRESSIONS OF THE CONVENTION.

My Dear Randall:

"The best Convention yet!" Well, it ought to be; every gathering for the next ten years should be better than its predecessors—that is, more practical, broader in its scope, and more helpful to all.

Some mistakes were made. One, in my opinion, was the spending of an hour or more on the questions pertaining to "salmon" brick. Better keep that product in the background.

I was especially pleased that so many of the papers were by the young men. It is a good omen for the future of the clay-working industry that the young men are coming to the front with their keen observation, their advanced ideas, and their enthusiasm.

I would especially emphasize what was said in the Convention about inducing the more extended use of clay products. We have seen the tremendous advance of the past fifteen years in clayworking machinery, greatly reducing cost and increasing production. We complain sometimes because the machinery men are inducing so many new plants. Instead, let us wake up and induce the more extended use of clay goods. The machinery men are simply stepping on our heels!

The resolution offered to the effect that the Association take official action in the direction of inducing the Government to erect its public buildings of clay construction should have been adopted. Who else will do it if we don't?

Ex-President Brush is endeavoring to have the fire limits extended in the City of Buffalo. Let the same effort be made in other cities by the brickmakers organized for the purpose. It means more brick. Let the dealers in clay building material also take hold of the work. They are in position, many of them, to help immensely.

Look at the advance made the past few years by the so-called fire-proof cement floors. How has it been done? By skillful engineering and persistent effort on the part of able men with architects and owners.

The manufacturers of clay-block floors must be equally wide-awake or they will lose the market.

The appointing of the committee to look into the comparative cost of brick and wooden houses is one of the best things ever done by the Association. The report of this committee, if exhaustive, will be of immense value, and if it is found that clay construction largely exceeds the cost of wood, it will simply be a challenge to the clayworker to reverse the conditions as quickly as possible.

I believe it can be done.

GEO. M. FISKE.

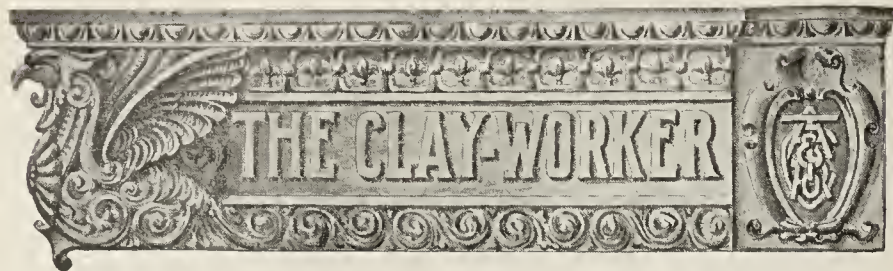
Boston, February 22, 1898.

Albert Wagner, 1306 Havemeyer Bldg., New York, N. Y., is on the market for a line of brickmaking machinery, including re-presses and all brickyard supplies.

E. N. Weigel, Little Rock, Ark., writes that he wants a good striker for the Monarch machine. The right man can have a permanent situation.

H. Bykeman, Roseland, La., will establish a brick and tile plant in that neighborhood and wants a complete outfit of machinery, etc. Good second-hand machinery will answer.





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#### CONVENTION ECHOES.

Fortunately, President Flinn is in the full vigor of a sturdy manhood physically as well as mentally, else that gavel would have proven too much for him.

\* \* \*

In this connection, we wish to whisper into friend Gates' buttonhole that a terra cotta gavel would be a very appropriate as well as useful gift to the National Association.

\* \* \*

Mr. J. Fred Smith, of Omaha, who represented the Nebraska clayworkers, made a good impression. If the invitation to hold the next Convention at Omaha is not accepted 'twill be no fault of his.

\* \* \*

Treasurer Sibley made his usual hit. Figures are dry things at best, but "Master John" always manages to weave a bit of wit into his report, which serves as a sugar coating and makes it easy to take.

\* \* \*

Little Miss Hettie Sibley was the youngest delegate—a real three-year-old. Her sweet face and winsome ways won many a compliment and brought tender thoughts to the minds of those who had left loved ones at home.

\* \* \*

The cablegram from the German Association of Clayworkers was a pleasing episode. There is a bond of fellowship between clayworkers the world over regardless of nationality. Each is interested in the progress and advancement of the others.

\* \* \*

Vice-Presidents Howard, Conway and Morse were each at different times called to the chair by President Flinn, and each presided with dignity and discretion. It was a departure from former custom and worked so admirably that it is sure to be repeated at future Conventions. It demonstrated anew the fact

that the members of the N. B. M. A. are almost without exception equal to any task or emergency that may confront them.

\* \* \*

"The Convention just ended," writes C. A. Bloomfield, Brooklyn, "was both in point of numbers attending and in interesting subjects discussed the most successful of any I have attended. Under no circumstances would I have willingly missed it."

\* \* \*

The two beautiful little silk flags that were suspended over the President's chair were the gift of Mrs. Anthony Ittner. It was a gracious patriotic offering. It is meet that Old Glory should find a place in every such gathering within the Nation's borders.

\* \* \*

"The best Convention yet," was heard frequently in the lobbies. It does really seem as though our Conventions increase in interest each year. Just now, while the glamour of Pittsburg is still upon us, it is difficult to conceive a more successful Convention than the one just held.

\* \* \*

The presence of an unusually large number of young men was the occasion for much comment. As President Brush remarked in his address, "We need all the new blood we can get." With the addition of such new recruits as Fiske, Merwin, Bleining, Gorton, Murtha, Cook, Diggs and others, there is every reason to feel complacent.

\* \* \*

Our new President grasps the helm with a firm grip. There is an air of sincerity and forcefulness about him that commands attention and respect at the very start. Clear-headed, self-reliant, he inspires confidence. There was not a member of the Convention but did not feel certain that, with President Flinn in command, our ship will ride into a safe harbor a year hence.

\* \* \*

President Brush's ready wit and sunny disposition has endeared him to the heart of every member of the N. B. M. A. His assurance on giving up the gavel that he would continue to attend the Conventions and do what he could to advance the interests of the Association deserved the applause given. When we wish him long life and prosperity, we know we echo the sentiments of the entire membership.

#### THEY ALL HAD WINDOWS.

W. R. Cunningham, secretary Wallace Mfg. Co., Frankfort, Ind., and president of the Clay-Working Machinery M'frs Association, writes: "I enjoyed the Convention at Pittsburg better than any I have previously attended, and I have not missed a National Convention for several years. While the rooms in the hotel had windows, they were too cold for comfort, but the "hot time" we had in the old town made up for that. The Pittsburg people have set an example it is going to be hard to beat."

#### THE PRESIDENT'S ADDRESS.

President Brush's address was a model in its way. Like his predecessors, he rose to the occasion and acquitted himself with much credit. In this connection we wish to say that from a literary standpoint no previous Convention has done better work. A glance over the papers with this quality alone in view will confirm this judgment. Certainly a comparison of this report with the earlier Conventions will show a great advance. Not alone is this apparent in the written papers, but as well in the quality of the extemporaneous efforts.

#### A NEW CERAMIC ASSOCIATION.

Growing out of the National Association, there has been formed a new association, to be known as the American Ceramic Association. It will meet the day before the national body and will consider the higher technical and scientific problems of the ceramic art. It will deal with every character of clay products: Brick, terra cotta, fire-proofing, pottery, tiles and



tiling, sanitary ware, and, in truth, the broad field of clay products; and will treat all from the standpoint of the scientist and technicist. This shows a great step in the advance of the Association—that a body of business men should see the commercial value of science and should be so ready to unite it with the practical work is certainly creditable to their intelligence.

#### THE UNIVERSITY SCHOLARSHIP.

With the general public nothing which the brickmakers have ever done has created so much comment as the founding of a scholarship in the Ohio State University, looking to the higher investigation of brickmaking and clayworking methods. The public looks back and considers brickmaking a homely industry. That the brickmakers should consider it worth their while not only to study the question from a high technical ground, but should found a scholarship in a university for the careful study and scholarly investigation of clayworking problems, is a circumstance not easily understood by the general public. However, it is along the line of advanced modern education. In Germany there are schools for barbers, for millers, stonecutters. There is the academy of the milk house and the school of the loom. We were certain that progressive brickmakers have always been in favor of this scholarship, and the action which has made that scholarship permanent through the recent work of the N. B. M. A. has confirmed this opinion. As is known, a permanent committee of five was appointed to have full charge of this matter. One member of the committee retires each year, and each year a new one is elected. Mr. Purington now stands as the senior member of this committee.

#### THE N. B. M. A. BADGE.

The souvenir badge presented to the visitors by the Pittsburgh brickmakers is one of the prettiest of the entire collection of N. B. M. A. badges. It is a neat little button, showing in miniature the old Block House, which we illustrated on page 249 of December Clay-Worker, and which is the most famous landmark in that section. The accompanying illustration does not do the badge justice, but it is the best that could be made, the letters being so small in the original that it is well nigh impossible to reproduce them legibly. The ribbon attachment was small, making the badge daintily attractive. The local committee has generally furnished the Secretary with a lot of extra badges, which will be sent to the absentees who desire them. First come, first served. Those who have not already done so should remit their dues at once if they want a souvenir of the Pittsburgh convention.



#### A MOVE IN THE RIGHT DIRECTION.

To our minds the most important work originated by the recent Convention was the inauguration of a campaign of education in the matter of brick building. The building of frame structures has ceased to be a matter of reason. In a new country, in a section of the world where money is scarce and interest high, the cheap frame structure is a natural outcome of the situation. With cheap money and plenty of it, and cheap brick and plenty of them, the building of elaborate frame structures is not good business, good sense or good art. The mere matter of insurance should cut some figure, but for some reason, which no man can understand, the greatest tax which

this nation pays is the one which it pays most willingly—the fire tax. One of the most successful insurance organizations in the world is the Boston Manufacturers' Mutual Fire Insurance Co. It had at risk at the close of 1897 \$111,000,000. Its fire losses during the year were \$32,500. The loss was 2¾ cents on each hundred dollars at risk during the year. The Factory Mutuals prefer brick buildings. In the Convention a committee was appointed to formulate literature to properly place before the people facts relating to the use of brick in building. It is our belief that this is an important step in the right direction. It is not sufficient that the architects should know these facts, or that the builders should know them. Such facts must go to the people directly, and we believe that thereby a greater demand for clay products will be created. There is a general sentiment not fully crystalized favorable to clay products. What is wanted are facts and figures. The question of value, cost of maintenance and of heating, cost of insurance, permanency, difference in values, should be placed before the people in a live way. It should be so stated that the man who runs may read.

#### THE SOCIAL FEATURE.

The powwow, the excursion, the theater party, the drives and other entertainments afforded the ladies and the general extension of courtesies by the people of Pittsburgh was something never to be forgotten. Many of us are so constituted that we always think the last Convention the best Convention we have ever had, but coming from Pittsburgh we were sure of it. The attention given to the ladies was never more generous, certainly never more gratifying. The Mayor of the city, over his autograph extended to the Convention the freedom of the city. In Pittsburgh this means much. The Mayor made a decided impression upon the brickmakers. He was recognized at once as an open-hearted, generous, brainy man. Along with Pittsburgh, we shall always think of Mayor Ford.

#### A NEW FIELD FOR CONVENTION WORK.

There is one point which the National Association has never touched, one point which it might well consider. We refer to the art side of the clayworker's product. Matters of constructive interest have always received due consideration. The technical side is now advancing rapidly. However, nothing has been said through the Convention and nothing of art interest has emanated from that body. The opportunity is before us. It is a good work for the Convention. Art added to a little clay makes great value. Clay products have received artistic attention, but not through the National Association. A material so plastic, one so expressive, a material which depends so much upon its art expression as clay should have attention from this point of view from a body which has had so much influence upon the material development of clay products. Everything cannot be done at once. We recognize this. A source of surprise is that so much has been done as has come from our Association during the past. We now see the opportunity and we present the thought in the abstract to the clayworkers of this country. We shall hope to see a paper devoted to this question presented at the next annual meeting of this body.

A number of the paving brick manufacturers of Ohio met at the Park Hotel, Columbus, O., Tuesday, February 1, 1898, for the purpose of entering into an agreement of some kind, by which they might be benefited financially, the continued cutting of prices having made this step necessary. Mr. R. D. McManigal, of the R. D. Manigal Sons Brick Works Co., of Middleport, O., was elected president. Mr. A. Hoover, of the Fultonham Brick & Tile Co., of Fultonham, O., was elected secretary. The second meeting was held at Kirk's Hotel, Zanesville, Ohio.



## ALL TOGETHER AT PITTSBURG.

Words by C. McDermott.

[Tune—"There'll Be a Hot Time in the Old Town To-Night."]

Come along, get you ready, take your best dress suit down,  
For dere's gwine to be a Convention in good old Pittsburg town,  
Where they'll welcome everybody, like royal fellows do,  
And give us all a banquet to drive away the blues.

When—it's—time for the banquet to begin,  
Loose—your—vest and fill up to the chin,  
And when you gets enough,  
You want to shout and sing  
There'll be a hot time in Pittsburg to-night,  
Brick-ma-kers.

Chorus:

When—you—hear dem glasses chink, chink, chink,  
All—join—in, and deeply you must drink,  
And when your tank—am—full  
And you can drink no more,  
We'll have a hot time in Pittsburg to-night,  
There'll be tales for everybody in good old Pittsburg town,  
From Buff'lo comes "Owl" Swegles, from Chicago Purington;  
Swegles tells a funny story 'bout a hundred-dollar owl,  
Which proved that he was worth it when we made the preacher howl.

Pur—ing—ton, he signed his name "Keystone,"  
When—he—wrote some letters just in fun,  
And then En—da—ly swore:  
When I get hold of him  
There'll be a hot time in the old town that night,  
Brick-ma-kers.

Chorus.

There'll be air for everybody in good old Pittsburg town,  
At Buffalo a machine man shed tears enough to drown,  
Said he got a little room, not a single window there,  
'Twas tough to pay three dollars, and then to get no air,  
Ma—chine—men, I tell you must have air,  
They—use—it to elucidate their ware,  
And if supply's—cut—off  
They could not shout and sing  
And have a hot time in Pittsburg to-night,  
Brick-ma-kers.

Chorus.

There'll be fun for everybody in good old Pittsburg town,  
For there's jolly D. C. Cawley, and G. H. Albertson;  
And good Mayor Ford, at the meeting to-day,  
Gave freedom of the city. Police get out the way!  
Grant Di-berf knows how to entertain,  
And they will show—yon—where,  
If you do not know the ropes,  
To have a hot time in Pittsburg to-night,  
Brick-ma-kers.

Chorus.

There'll be girls for everybody in good old Pittsburg town;  
When Convention was in Cleveland, a girl with a red gown  
Saw four-year-old McGraw, with his beautiful head,  
She threw her arms around him, and this is what she said:  
Please, Oh, please, Oh, do not let me fall,  
You're all mine and I love you best of all,  
And you must be my man, or I'll have no man at all—  
There'll be a hot time in Pittsburg to-night,  
Brick-ma-kers.

## I WAS NEVER SO SURPRISED IN ALL MY LIFE.

As you all know, it's quite the go,  
Whenever you meet a friend,  
To say, "Come, have one on me,"  
And then your elbow bend,  
Only last night I said to Pike:  
"Let's take one on the sly;"  
He smiled and said not anything,  
But slyly winked his eye.

And I was never so surprised in all my life,  
And I surely hope 'twill never reach his wife,  
But he doesn't often drink, as to look at him you'd think,  
But he ordered seltzer—and—I took the same—nit.

As you all know, it's quite the go,  
Meeting a lady friend,  
To say, "Come, take a walk with me,"  
And then your elbow bend,  
Only last night Randall said that,  
To a damsel young and sly,  
She smiled and said not anything,  
But saucily winked her eye.

And I was never so surprised in all my life,  
And I surely hope 'twill never reach his wife,  
For he doesn't often flirt, still the damsel was so pert,  
And his conscience seemed to smite him, and he left her—nit.

With bunco men it's quite the go  
To sell a golden brick  
To greenhorns from Montana,  
And then they fool them slick,  
Only last night one said to Bray,  
"I'll sell this on the sly;"  
Bray smiled and said not anything,  
But slyly winked his eye.

And I was never so surprised in all my life,  
And I surely hope 'twill never reach his wife,  
For he doesn't often bite, but the bunco was too bright—  
He took the brick to sell it—and he was rich—nit.

With machine men it's quite the go,  
Going to the Convention,  
To talk brickmaker's arm clear off,  
If there's no intervention,  
Only last night poor Charles Raymond  
Took one out on the sly,  
Who smiled and said not anything,  
But up and blacked his eye.

And I was never so surprised in all my life,  
And I only hope 'twill never reach his wife,  
I tell you it was fun, for Charles Raymond talked right on,  
Until brickmaker wilted—and he made the sale—nit.

## TABLE OF CONTENTS.

## OFFICIAL REPORT.

|                                                                                 |     |
|---------------------------------------------------------------------------------|-----|
| Proceedings of the Twelfth Annual Convention of the N. B. M. A. Convention..... | 95  |
| The Opening Prayer.....                                                         | 95  |
| Mayor Ford's Welcome.....                                                       | 95  |
| President Brush's Address.....                                                  | 96  |
| Treasurer's Report.....                                                         | 97  |
| Letters From Absent Members.....                                                | 97  |
| Election of Officers.....                                                       | 98  |
| Looking Forward.....                                                            | 100 |

## SECOND SESSION.

|                                                                                                                                                |     |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| This Use of Electric Tramways In Hauling Clay.....                                                                                             | 106 |
| Burned Clay as a Fire-Proofing Material.....                                                                                                   | 107 |
| The Refractory Qualities of Clay.....                                                                                                          | 110 |
| A Reducing Condition in Burning.....                                                                                                           | 114 |
| Have Continuous Kilns Proven Successful in Burning Face Brick?.....                                                                            | 115 |
| Will Any Salmon Brick Withstand Exposure to Freezing?.....                                                                                     | 115 |
| How Much Water can a Brick Absorb and Yet be Safe from Frost Disintegration?.....                                                              | 116 |
| Does not Saltpetering Injure Salmon Brick of Much as Frost?.....                                                                               | 117 |
| Have not Brickmakers Made a Mistake and Sacrificed the Artistic Effect by Too Close Shading for Color in Trying to Produce a Monotone Front?.. | 118 |

## THIRD SESSION.

|                                                                     |     |
|---------------------------------------------------------------------|-----|
| The Economy of Brick Structures as Compared with Those of Wood..... | 119 |
| The Mayor of Allegheny Sends Greeting.....                          | 120 |
| Does the Use of Oil as a Fuel Increase the Fire Hazard?....         | 122 |
| Drying Brick in Kilns by Use of Heat From Cooling Kilns....         | 122 |
| After The Next Convention....                                       | 126 |
| Experimental Work, Wise and Otherwise.....                          | 127 |
| Committee on Resolutions....                                        | 127 |

## FOURTH SESSION

|                                                                                                                                                                           |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Why Do Some Brickmakers Live in Wood Houses?.....                                                                                                                         | 129 |
| How to Increase the Use of Brick.....                                                                                                                                     | 130 |
| A Message From Over the Sea..                                                                                                                                             | 132 |
| Brickmakers' Accounts.....                                                                                                                                                | 132 |
| Distribution Sheet of The Blank Press Brick Co.....                                                                                                                       | 135 |
| Brickmaking in The Far Northwest.....                                                                                                                                     | 138 |
| Proposed Revision of By-Laws.....                                                                                                                                         | 139 |
| Social Amenities.....                                                                                                                                                     | 140 |
| Is Drying Up-Draft in a Down Draft Kiln an Economy.....                                                                                                                   | 140 |
| Committee on Revision of By-Laws.....                                                                                                                                     | 141 |
| Does It Pay to Cover the Top of an Up-Draft Kiln With Earth                                                                                                               | 141 |
| How are Ornamental Brick Generally Burned in an Ordinary Dry-Press Yard.....                                                                                              | 142 |
| Is Air Pressure as Good as Steam in the Use of Oil For Burning Brick?.....                                                                                                | 142 |
| Is the Standard Size of Common and Face Brick adopted By the N. B. M. A. Generally Adhered To? If not, What Further can Our Association do to Maintain the Standard?..... | 143 |
| What is the Best Metal for Making Dies for Ornamental Brick                                                                                                               | 144 |

## FIFTH SESSION.

|                                                      |     |
|------------------------------------------------------|-----|
| Manufacture and Use of Press Brick in the South..... | 144 |
|------------------------------------------------------|-----|

|                                                                                                                                                               |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Soft Mud Brick.....                                                                                                                                           | 144  |
| Is Burning Brick With Producer Gas a Success in Europe? If so, Why is it not Introduced In this Country?.....                                                 | 145  |
| Is it Practicable to Make Gas from Bituminous Slack for Burning Brick?.....                                                                                   | 146  |
| Which is the Best Way to Set and Burn Fire-Flashed or Impervious Face Brick?.....                                                                             | 146  |
| Report of the Committee on Technical Investigation.....                                                                                                       | 147  |
| Is it Best to Set Dry-Press Brick in the Kiln Direct from Machine, or to Pass them through the Dryer, Economy in Drying and Quality of Brick Considered?..... | 148  |
| Will an Iron Stack do as Good Work on a Continuous Kiln as a Brick Stack.....                                                                                 | 149  |
| Does Age, when in Use, or When Under Cover and not Exposed Directly to Weather, Improve Brick in Resistance to Abrasions?.....                                | 150  |
| How Can the Element of Noise in Brick Pavements be Obviated or Minimized?.....                                                                                | 152  |
| Report of the Executive Committee.....                                                                                                                        | 154  |
| Miscellaneous Business.....                                                                                                                                   | 154  |
| Report of Committee on Resolutions.....                                                                                                                       | 154  |
| Want the Next Convention....                                                                                                                                  | 154a |
| The Annual Powwow.....                                                                                                                                        | 154b |
| Mr. Robinson's Address.....                                                                                                                                   | 154b |
| Mr. Purington as a Lecturer...                                                                                                                                | 154c |
| List of Members N. B. M. A....                                                                                                                                | 154d |
| Executive Committee.....                                                                                                                                      | 154e |
| Committee on Technical Investigation.....                                                                                                                     | 154e |
| In Memoriam.....                                                                                                                                              | 154e |
| A Noted Pittsburgh Firm.....                                                                                                                                  | 154f |
| The Nebraska Brickmakers' Convention.....                                                                                                                     | 154f |
| Friday's Excursion.....                                                                                                                                       | 154h |
| The Machinery Annex.....                                                                                                                                      | 154h |
| The Ceramic Association of the Ohio State University.....                                                                                                     | 155  |
| Chambers Bros. Co's. Exhibit at Pittsburgh Convention.....                                                                                                    | 159  |
| A New Dry-Press with a Government Indorsement.....                                                                                                            | 166  |
| An Artesian Well Spouts Clay.                                                                                                                                 | 166  |
| The Ceramic Association of the Ohio State University.....                                                                                                     | 168  |
| French Peasant Women Working American Brick Machines                                                                                                          | 168  |

## CORRESPONDENCE:

|                                                           |      |
|-----------------------------------------------------------|------|
| Convention Echoes.....                                    | 154g |
| Impressions of the Convention By A New Member.....        | 154g |
| The Last The Best of All.....                             | 154g |
| Impressions of the Convention In And About Cleveland..... | 164  |
| St. Louis News.....                                       | 164  |
| Buttonhole Talks.....                                     | 168  |
| The New York Market.....                                  | 170  |
| Pacific Coast News.....                                   | 172  |

## EDITORIAL:

|                                              |     |
|----------------------------------------------|-----|
| Convention Echoes.....                       | 156 |
| They All Had Windows.....                    | 156 |
| The President's Address.....                 | 156 |
| A New Ceramic Association....                | 156 |
| The University Scholarship....               | 157 |
| The N. B. M. A. Badge.....                   | 157 |
| A Move in the Right Direction.               | 157 |
| The Social Feature.....                      | 157 |
| A New Field for Convention Work.....         | 157 |
| Editorial Notes and Clippings.               | 162 |
| All Together At Pittsburg.....               | 158 |
| I Was Never So Surprised in All My Life..... | 158 |

**WANTED.**—Forty double-deck dry cars; width of gauge 24-inch. Must be in good condition. (2 tf d) Address E. & H., care Clay-Worker.

**WANTED.**—An experienced foreman who understands fully how to make dry press and stiff mud brick. In writing give previous experience, references and wages desired. Address DALE, care Clay-Worker.

**WANTED.**—A good second-hand stone crusher suitable for reducing large chunks of hard shale prior to its going to dry pan. Give name of maker, time used, condition, price, etc. Address ADA, care Clay-Worker.

**BRICK PRESSES FOR SALE.**—One nearly new 3 mold Brewis Brick Press, used one season, \$1000.00; one Ditto, used three seasons \$800.00; one nearly new Steadman Pulverizer, \$250.00. All in good condition. Address 23 dm GERNERT LUMBER CO., Louisville, Ky.

**FOR SALE.**—I will sell the whole or a one-half interest in one of the best equipped Dry Press brick plants in Pennsylvania, 90 miles from New York City and 100 miles from Philadelphia. Capacity 10,000 per day; two mold Boyd Press, 9 ft. (Fisher) grinding dry pan. 60 h. p. engine, two 60 h. p. boilers, 49 cars, steam dryer, 3 down draft kilns (capacity about 75,000 each) three beds of clay, from which red, buff or white brick can be made. Plant new and complete and can make brick the year round; can be making brick in two hours. Plenty of brick on hand to show color and quality, investigation solicited. Call on or address 22 dm JAMES EDINGER, Stroudsburg, Monroe Co., Pa.

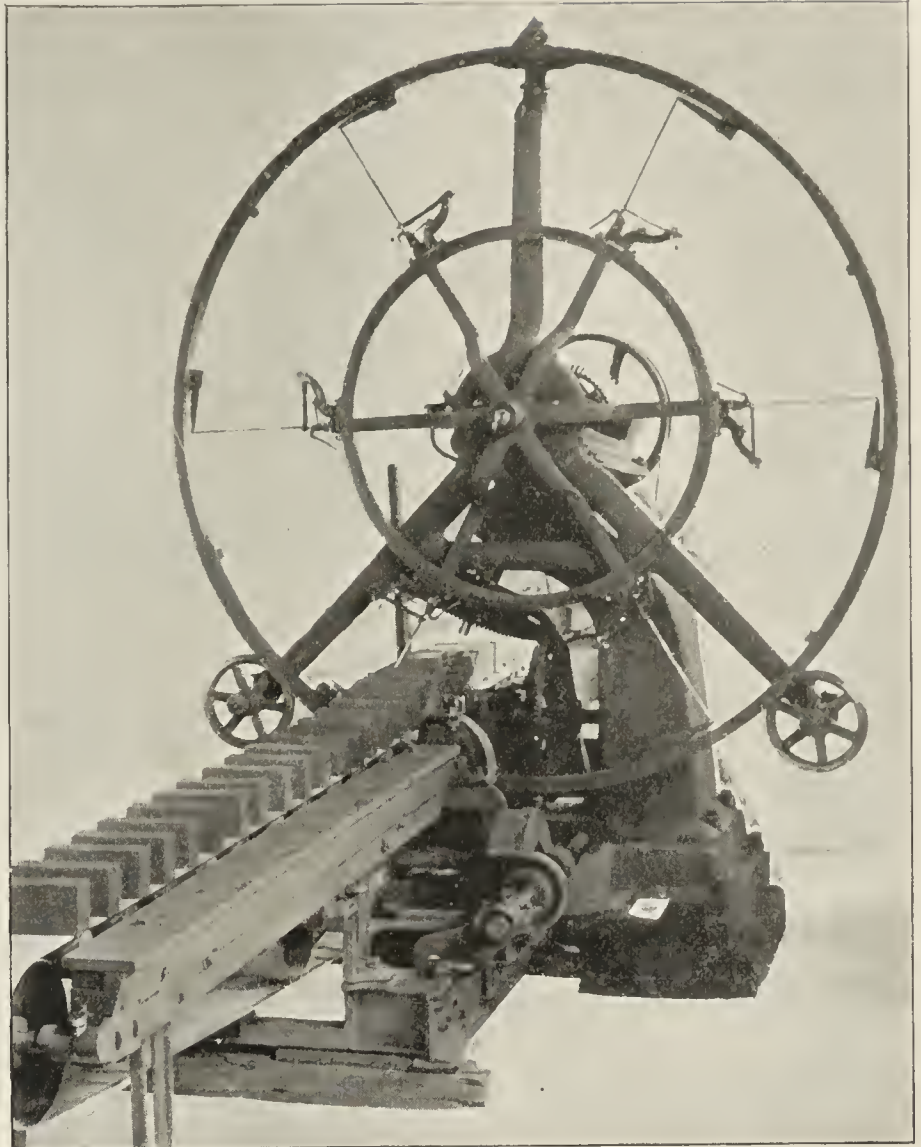


CHAMBERS BROS. CO'S. EXHIBIT AT PITTSBURGH CONVENTION.

IN THE EXHIBITION ROOM at the Convention the Chambers Brothers Company, of Philadelphia, made a very interesting display of framed photographs of some of the machines they build for the clayworking trade, among them being their New Automatic Side Cutter for Stiff Tempered Brick Machines, which we reprint herewith. We know that they have been working in this direction for some time, and have made and discarded at least two automatic side cutters of different patterns as not sufficiently meeting their ideas of brickyard machinery, and it is with considerable gratification that they announce the entire success of the cutter now offered. They have given it a thorough and practical test, and are building and shipping it as rapidly as possible in fulfillment of orders that have been awaiting its completion.

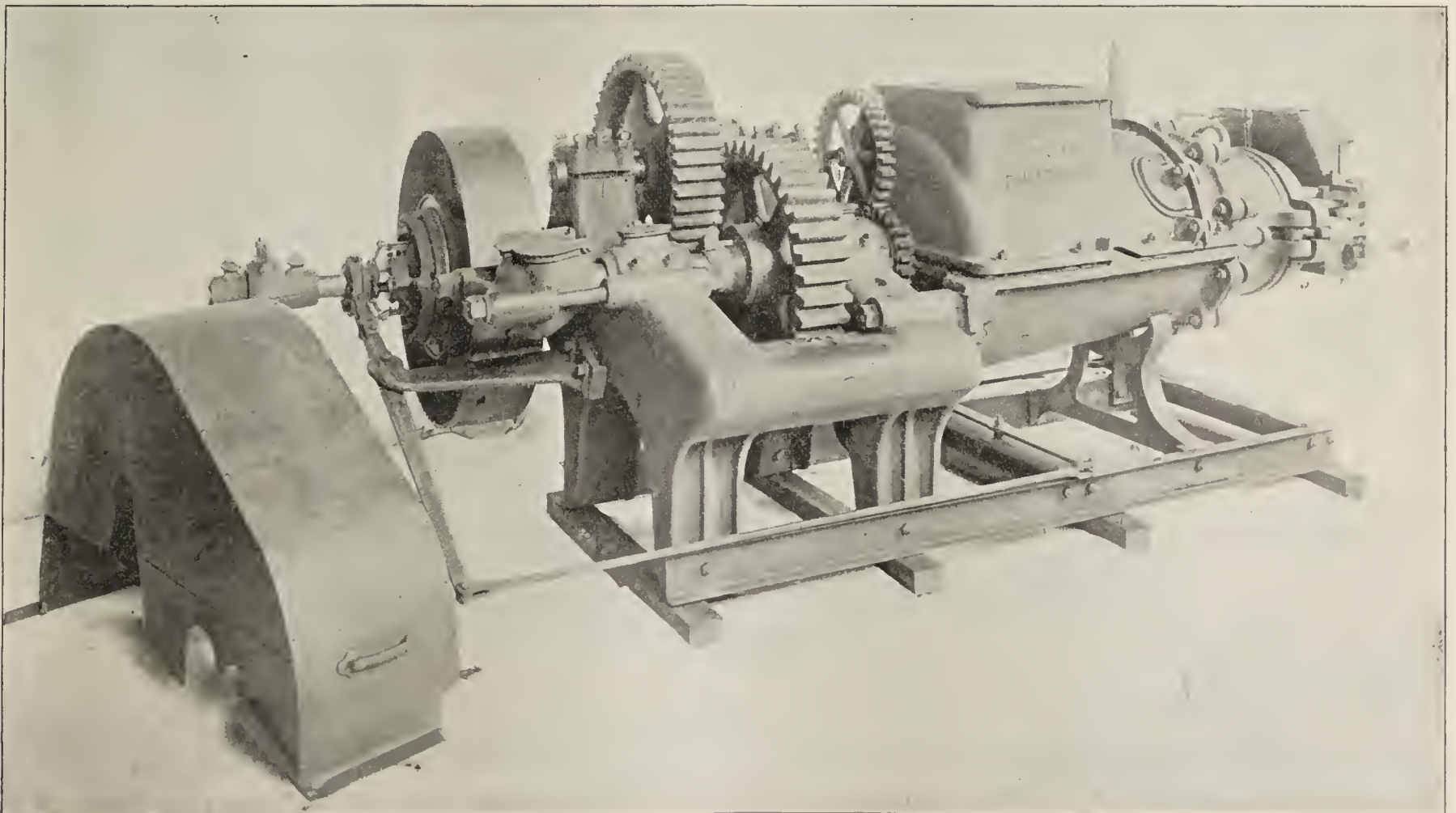
They describe it as a rotary cutter, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, push all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter. Broken wires are easily and quickly replaced. An automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc. There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of seventeen turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute. The machinery is above the dirt and all gearing encased.

In connection with their New Intermediate or No. 6 Side-Cut Brick Machine with lubricated die, it makes a remarkably fine outfit for the production of a superior quality of side-cut brick.



CHAMBERS BROS. CO'S. AUTOMATIC SIDE CUTTER.

The Messrs. Chambers show in this their usual confidence in the staying qualities conspicuous in all of their product by offering this new side-cut brick machinery subject to trial and approval. The cutter is so designed that it can be placed on any of the larger end-cut brick machines of the Chambers Company.



CHAMBERS BROS. CO'S. "INTERMEDIATE" OR NO. 6 SIDE CUT BRICK MACHINE.



## INDEX TO ADVERTISERS.

## Brick Machinery—Dry Press Process.

| Name.                              | Page.  | Name.                                       | Page.              |
|------------------------------------|--------|---------------------------------------------|--------------------|
| Ross-Keller Brick Mach. Co...      | 91     | The American Clay-Working Machinery Co..... | 169, 171, 197, 205 |
| Simpson Brick Press Co .....       | 92     | The Fernholtz Brick Press Co..              | 90                 |
| The Chisholm, Boyd & White Co..... | 88, 89 |                                             |                    |

## Brick and Tile Machinery.

|                                       |          |                                                 |                    |
|---------------------------------------|----------|-------------------------------------------------|--------------------|
| Anderson Foundry and Mach. Works..... | 192      | St. Louis Pulverizer Co .....                   | 86                 |
| Baird and Son, H. C.....              | 185      | Steele, J. C., & Son.....                       | 186                |
| Brewer, H. & Co .....                 | 203      | The A. Bonnot Mfg. Co.....                      | 173                |
| Carlin's Sons, Thomas .....           | 191      | The Fate-Gunsaulus Co.....                      | 198                |
| Central Machine Works .....           | 195      | The Huettelman & Cramer Co...                   | 191                |
| Chambers Brothers Co., 85, 177, 194   |          | The American Clay-Working Machinery Co.....     | 169, 171, 197, 205 |
| Chicago Brick Machinery Co...         | 176      | The Horton Mfg Co .....                         | 200                |
| Eagle Iron Works.....                 | 178      | The Eastern Machinery Co.....                   | 206                |
| Freese, E. M. & Co .....              | 204      | The Henry Martin Brick Mach. Mfg. Co .....      | 196                |
| Frost Engine Co .....                 | 199      | The Leader Mfg. Co.....                         | 194                |
| Hensley, J. W.....                    | 182      | The Ohio Ceramic Engineering Co .....           | 93                 |
| Kells & Sons .....                    | 184      | The Wallace Mfg. Co.....                        | 175, 207           |
| Means & Co., Jas.....                 | 182      | The Wellington Machine Co                       | 165, 167           |
| Madden & Co.....                      | 184      | Williams Patent Crusher and Pulverizer Co ..... | 174                |
| Murray & Welch .....                  | 180      | Wiles Co., A. M. & W. H .....                   | 186                |
| Potts & Co., C. & A.....              | 190, 202 | Woolley Foundry and Machine Works .....         | 201                |
| Progress Press Brick & Mach Co        | 172      |                                                 |                    |
| Raymond & Co., C. W .....             | 161, 163 |                                                 |                    |
| Stedman's Machine Works.....          | 186      |                                                 |                    |
| Schoellhorn-Albrecht Mach. Co.        | 86       |                                                 |                    |

## Brick Kilns and Dryers.

|                            |     |                                |     |
|----------------------------|-----|--------------------------------|-----|
| Alsip, S. H .....          | 187 | Pike, E. M.....                | 181 |
| Carson, J. W.....          | 178 | Phillips, S. G.....            | 181 |
| Eudaly, W. A .....         | 188 | Reppell, L. H .....            | 187 |
| Haigh, H.....              | 189 | Swift, F. E.....               | 182 |
| Hundt & Co., F .....       | 180 | The American Blower Co.....    | 208 |
| Kaul, C. F.....            | 180 | The Fernholtz Brick Press Co.. | 90  |
| Lehmann & Co., F.....      | 189 | The Standard Dry Kiln Co.....  | 94  |
| Morrison & Co., R. B ..... | 188 | Wolff Dryer Co.....            | 208 |
|                            |     | Yates, Alfred.....             | 180 |

## Brick Yard Supplies.

|                               |     |                                              |     |
|-------------------------------|-----|----------------------------------------------|-----|
| Arnold, D. J. C.....          | 192 | Phillips & McLaren .....                     | 179 |
| Coldewe & Co., G.....         | 178 | The Atlas Bolt & Screw Co.....               | 193 |
| Carnell, Geo.....             | 187 | The Harrington & King Perforating Co .....   | 87  |
| Caldwell & Son Co., H. W..... | 183 | The Henry Martin Brick Machine Mfg. Co ..... | 196 |
| Carmichael, T. W.....         | 182 | The Horton Mfg. Co.....                      | 200 |
| Elder & Dunlap.....           | 179 | The Pittsburg Mineral Screen Company.....    | 181 |
| Marion Steam Shovel Co.....   | 193 |                                              |     |
| Mey, F. H. C.....             | 181 |                                              |     |
| Mershon & Co., W. B.....      | 87  |                                              |     |
| Newton, A. H.....             | 185 |                                              |     |

## Miscellaneous.

|                                           |     |                                    |     |
|-------------------------------------------|-----|------------------------------------|-----|
| Associated Trade & Industrial Press ..... | 182 | Schools .....                      | 183 |
| Bennett & Sayer.....                      | 177 | Indiana, Decatur & Western ...     | 184 |
| Big Four R. R.....                        | 185 | Illinois Central R. R .....        | 184 |
| Cincinnati, Hamilton & Dayton R. R .....  | 183 | Kendall & Flick.....               | 179 |
| Chandler & Taylor Co.....                 | 160 | Lake Erie & Western.....           | 185 |
| Chesapeake & Ohio R. R.....               | 185 | Main Belting Co .....              | 183 |
| Cotton Belt Route.....                    | 185 | Monon Route .....                  | 183 |
| Dean Bros. Steam Pump Works               | 177 | Munn & Co.....                     | 183 |
| Dover Fire Brick Co.....                  | 183 | Osborne, W. R.....                 | 181 |
| Evens & Howard .....                      | 179 | Ropkey-Mason Engraving Co..        | 178 |
| Eugene Field Monument Souvenir Fund.....  | 179 | Sorge, A. Jr.....                  | 179 |
| Gabriel & Schall.....                     | 180 | Tennille, A. F.....                | 181 |
| Geysbeek, S.....                          | 180 | The Jeffrey Manufacturing Co..     | 185 |
| International Correspondence              |     | The Rockwood Mfg. Co .....         | 183 |
|                                           |     | Vandalia Line .....                | 181 |
|                                           |     | Waterman, L. E. & Co.....          | 181 |
|                                           |     | Small Ads., Wanted, For Sale, etc. |     |

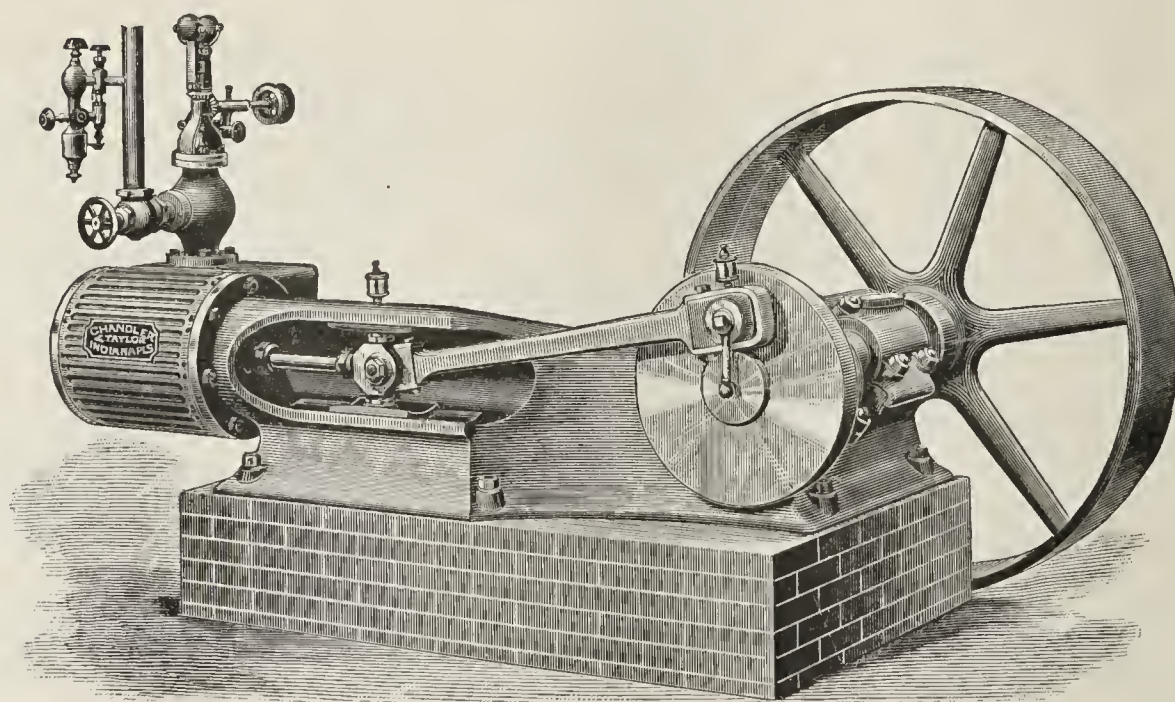
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# A NAKED PROPOSITION

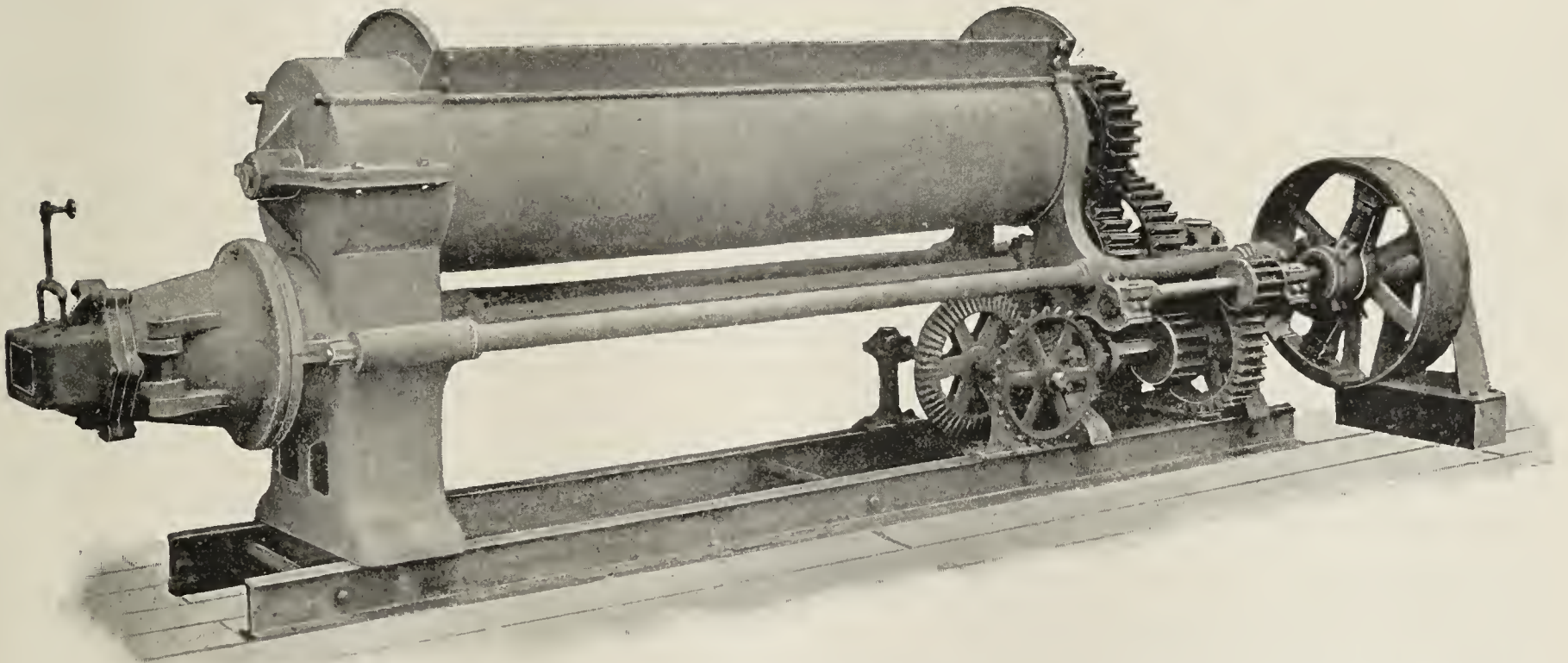


*Unadorned with -  
Gilded Sophistry  
or Seductive - - -  
Fabrication - - -*

*It is a fact that compound gearing is superior in every respect to single gearing. Single gearing requires more power to operate. It wears out more quickly. It is much harder on the machine. In short, it is but a weak attempt by cheap machine manufactures to make one gear and one pinion do the work that should be done by two gears and two pinions, in order to reduce the cost, thereby giving them larger profits. You can not afford a single-gearred brick machine at any price.*

*The Raymond No. 2 Compound-Geared Combined Brick Machine is operated by four massive gears and two heavy pinions, which form the mechanical equivalent of an independant Compound-Geared Pug Mill and a Compound-Geared Brick Machine. It also has many other points of excellence that you can not afford to ignore. For instance: Its main shafts are 3½ inches hexagon hammered steel and the others are proportionally heavy. The die has a hinged front and is fitted with our improved scale liners for steam, oil, or water lubrication. It is bolted down on channel iron I beams instead of wooden skids—making it more rigid and strong. These I beams do not warp or twist and throw the machine out of line as wooden ones do when subject to brick yard use. The Pug Mill is 9 feet long. Its estimated weight is 12,000 lbs. and has a capacity of from 25 000 to 40,000 bricks per day.*

*In short, in this article we have endeavored to elevate the Combined Machine from the class generally known as cheap where it has been placed, to that of the high finished, durable, easy running, high grade, first class Brick Machine and it is to you, our patrons, to whom we turn for the success or failure of our efforts.*



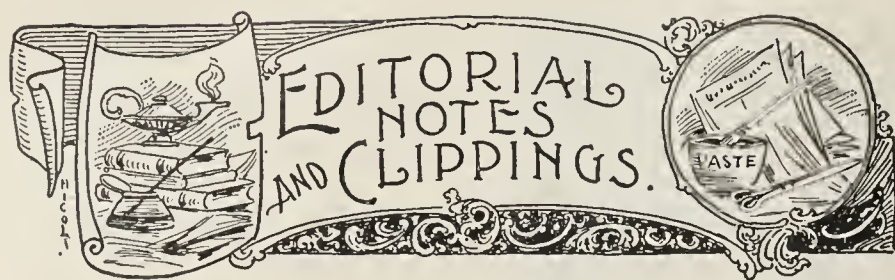
## Raymond No. 2

## Compound-Geared Combined Machine.

*The Automatic Board Delivery Cutting Table will interest you.*

**C. W. RAYMOND & CO.**  
DAYTON, OHIO.





Moosic, Pa., is to have a new brickyard.

T. Wollers will start a brickyard at Atchison, Kan.

W. F. Goodman, Concord, N. C., wants to purchase a brick machine.

The death of Andrew Thaison, of Laredo, Texas, occurred in that city recently.

Thos. P. Alston contemplates the manufacture of brick and tile at St. Augustine, Fla.

Jos. Lebreque has purchased land at Rumford Falls, Me., and will start a brickyard.

The Empire Press Brick Co., at Denton, Texas, will make a trial of petroleum for fuel.

Jno. Kostner and Jno. Meklenberg contemplate establishing a brick plant at Arcadia, Wis.

Mr. Sabin will manufacture tile as well as building brick at his plant at Mansfield, Ohio.

The brick plant of Kelsey & Mather, at Richmond, Ind., was destroyed by fire the 17th inst.

The Marshall Brick Co. has been incorporated at Rapid City, Iowa, with a capital stock of \$10,000.

The Reed Brick Works, of Abbeville, Ga., is in the market for a pug mill, either new or second-hand.

Edward E. Gordon, Elba, La., is in the market for brick machinery of 15,000 to 20,000 daily capacity.

J. F. Scott will make extended improvements at his brick plant at Tipton, Tenn. He will put in an electric motor.

Aberdeen, S. Dak., wants a brickyard. There is no plant in that immediate vicinity, brick being shipped from Montana.

The Emory Brick Co., Harriman, Tenn., will remodel their plant, making it suitable for the manufacture of paving brick.

J. L. Cooksey, Clifton, S. C., would be pleased to receive price list of brick machinery and a complete outfit for a brick plant.

The Queen City Brick and Tile Co. will erect a plant at Cumberland, Md., for the production of building and vitrified brick. Frederick Perry is manager.

S. Smith and Maggard Bros. have formed a partnership and will open up a brick plant at Sumter's Switch, near Yorkville, Ala. They have a fine quality of clay.

The death of R. Campbell, manufacturer of stove fire-brick at Hamilton, Ont., occurred recently. By his demise the firm name is changed to R. Campbell's Sons.

The dryer at the brick plant of D. Warren De Rosay, North Cambridge, Mass., was badly damaged by fire January 25th. It is supposed to have been the work of tramps.

The Ramsdell brick plant at Denning Point, N. J., has been leased by the Washburn Bros., at Haverstraw, N. Y., who will operate it in connection with their other plants.

Rupright Bros., brick manufacturers of Van Wert, Ohio, contemplate changing the base of their operations to Vilas Co., Wis., where they have a large bed of valuable clay.

The Fultonham (Ohio) Brick & Drain Tile Co. were damaged by the late blizzard to the extent of \$100 or more, by having the roof blown off of one of their large up-draft kilns.

The brick manufacturers of Decatur, Ill., have formed an organization, to be known as the Decatur Brick Co. The full working plan of the association has not been entirely completed.

The Douglas & Whisler Brick Co. has been organized to manufacture brick at Vanport, Pa., where they have purchased a large tract of land and will erect a plant of 40,000 daily capacity.

Wm. H. Hunt, general manager, advises us that the name of the Akron Hydraulic-Press Brick has been changed to the Cleveland Hydraulic-Press Brick Co., whose office is in Cleveland, Ohio.

So great has been the demand for the new '98 catalogue of the American Clay-Working Machinery Company that a second edition has been necessary. Several extra thousand copies have been issued and sent to those who have inquired

for it in the South and Southwest. The catalogue is a voluminous one, and seems to be quite popular. A copy will be sent to any one who is interested.

Frank Fiederling and E. H. Wilkerson have leased the Settle brickyard at Clarksville, Tenn., and will manufacture brick in the spring. The style of the firm will be E. H. Wilkerson & Co.

E. Siniff has purchased the brick plant at Pittsburg, Kan., formerly owned by F. Massman. Mr. Siniff will at once put in improved machinery and make other preparations for turning out a first-class brick.

The Mobile (Ala.) Brick Co. has been incorporated. W. P. and M. S. Martin and G. F. and E. A. Arnold, all of Brewton, Ala., are interested. The plant, which will be built at once, will be located near Mobile.

The Knight Engineering Co., of Wabash, Ind., advises us that they would be pleased to receive catalogues and prices on brick, terra cotta, roofing tile and other clay products for building, paving and sewer purposes.

The Ashland (Ky.) Fire Brick Co. was burned to the ground February 15th. The loss amounts to several thousand dollars. The night watchman has not been seen since the fire, and it is feared he was burned to death in the fire.

Capt. Jas. Farley, a well-known brick manufacturer of Grassy Point, N. Y., received a kick from an unmanageable horse some time ago, which resulted in his death February 5th. The Captain leaves a wife and five children.

At a meeting of the directors of the Fultonham (Ohio) Clay Manufacturing Co. it was decided to move their works to a better position and enlarge, by putting in heavier machinery; also adding a dry-press plant and steam dryer.

The Fizer Brick Co., at Knoxville, Tenn., has been sold to the State of Tennessee. It will be operated by the State, W. H. Fizer in all probability being retained as manager. Nearly all of the labor will be carried on by State convicts.

D. Storrs, chief engineer of the Kansas State Penitentiary at Lansing, Kan., in a recent letter says: "This institution is contemplating going into the fire-clay business and would like to get prices on suitable and up-to-date machinery."

Philip Faust and Joseph Reihle, of Auburn, have purchased the Carlinville (Ill.) Brick and Tile Works, and will put the same in good shape and commence the manufacture of brick and tile. The works have been idle for three years.

Jno. E. McKinney, a well-known citizen and brick manufacturer of Richwood, Ill., died at his home in that town February 13th. Mr. McKinney was seventy-one years old, and had been engaged in the manufacture of brick for more than twenty years.

Frank Stevenson, general superintendent of the clay mining business of M. A. Edgar, dropped dead on the street at New Brunswick, N. J., while on the way to board a train on his way to the clay mines at South Amboy. His death was due to heart failure.

The finishing department of the pottery of Whitmore, Robinson & Co., at Akron, was damaged to the extent of \$30,000 by fire recently, which was covered by insurance. The company had just finished rebuilding a portion of the plant destroyed by fire a year or more ago.

The La Prairie (P. Q., Ont.) Pressed Brick and Terra Cotta Co. have decided to build another Peerless up-draft kiln. They are also entirely rebuilding their 16-chamber continuous kiln to the plans of J. W. Carson. Business promises a decided revival and they are getting in shape to meet it.

D. P. Montague, of Montague & Co., proprietors of the Chattanooga (Tenn.) Clay Works, has purchased the plant of the Lookout Sewer Pipe Co., situated in Walker County, Ga. Mr. Montague says they will operate both plants for a time, and eventually work the one that best suits their convenience.

J. E. Kehoe, Braidenton, Fla., asks us to announce that he contemplates putting in a complete plant with a daily capacity of 20,000, and would like to hear from manufacturers of brick machinery, etc., as to prices, etc. He says he is now manufacturing by hand and is meeting with very satisfactory results.

John R. Thomas, president of the Niles (Ohio) Fire Brick Co., died at his home in Niles, January 26th. Mr. Thomas was one of the best known and most respected manufacturers in the Mahoning Valley, and his death will be heard with great regret in business circles all over the country. He was sixty-four years of age, and was born in Wales.

The fire-brick works of Welch, Gloninger & Co. at Vanport, Pa., was almost totally destroyed by fire January 29th. Mr. J. H. Cunningham, manager of the Pittsburg office, in a recent letter, says: "The fire took everything in its way but the kilns.

[CONTINUED ON PAGE 164.]





# He is Using It

and by the self-evident look of enjoyment and contentment on his countenance, it is certainly giving him the best of satisfaction. No begged or purchased testimonials or rhetorical bombast of any kind is necessary to prove this. The very fact that he is continuing to use it, together with his general air of healthiness, happiness and prosperity, proves beyond all questions of doubt that its use is thoroughly beneficial. So it is with Raymond Brick Machinery. We have on file voluntary testimonials from our hundreds of friends, for which we are duly grateful, and which we will be pleased to show any one who desires to see them, but we will not occupy your valuable time to merely flatter our personal vanity by publishing them. The very fact that these concerns are using our machinery—day in and day out—year in and year out—making money—growing happy and prosperous by its use—is an encomium far greater than could be written in the most refined language of the accomplished litterateur, or delivered in the eloquent rhetoric of the finished orator. And what is still better, when their machinery wears out, they come back to us and buy more.

ONCE A CUSTOMER, ALWAYS A CUSTOMER.

Write Us immediately for  
PHOTOGRAPHS AND DESCRIPTION

— OF OUR NEW —

**No. 2**

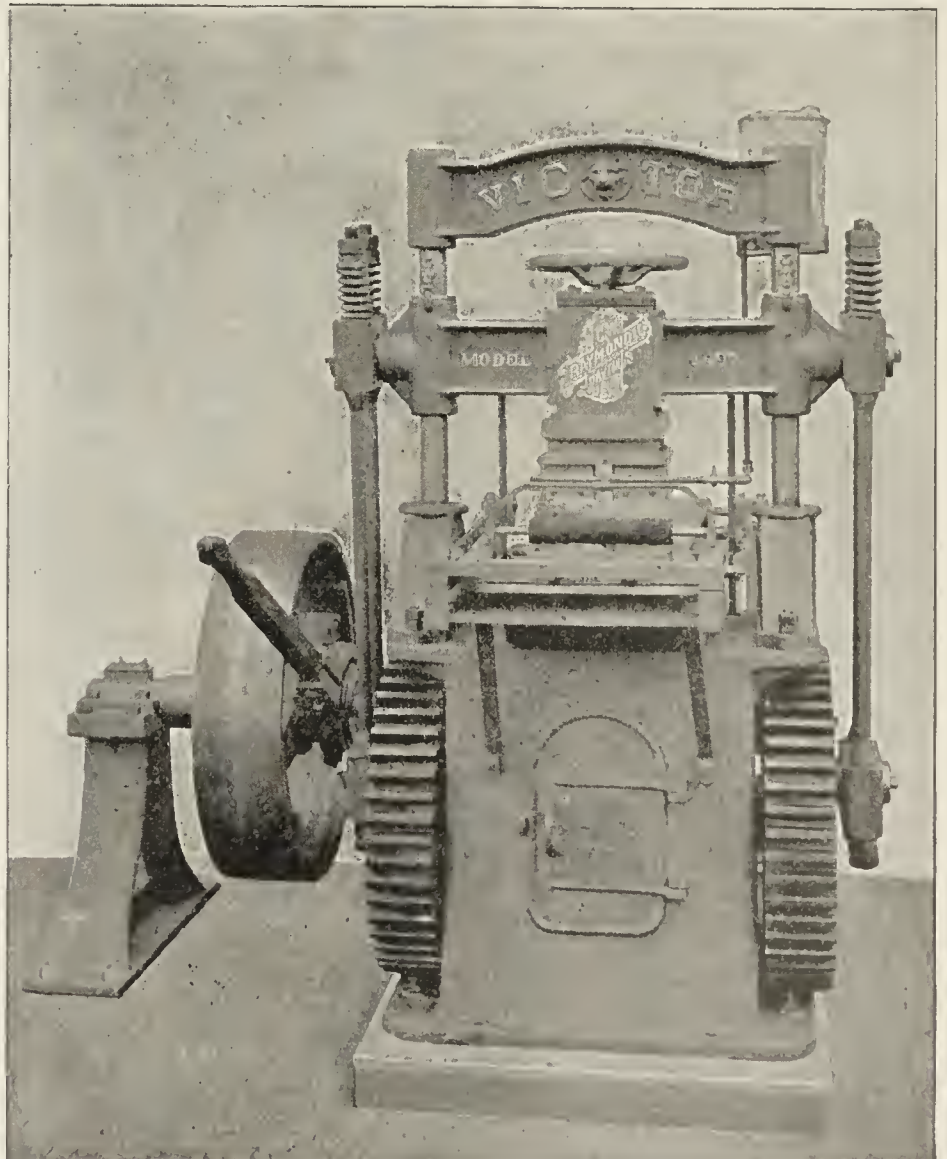
**Compound=Geared  
Combined Machine**

++ AND ++

**Automatic Board=**  
**Delivery Cutting=**  
**Table**

This Outfit is a  
Revelation = = =

**C. W. RAYMOND & CO.**  
DAYTON, OHIO.



THE RAYMOND "VICTOR" RE-PRESS.



## EDITORIAL NOTES AND CLIPPINGS.—Continued.

and entails a loss of about \$15,000 over and above the insurance, which was only \$4,000. We will rebuild at once with all the latest improvements, and make better brick, and expect to have the brick ready for the market by April 1st at the latest. In the meantime will take care of as much of our trade as possible at the Monaca and Welch Works.

Mr. Kendall, of Kendall & Flick, states that his firm has enjoyed a most gratifying business during 1897, and look for a very busy year in '98. In fact, he states that since Christmas they have been running "double turn." All clayworkers using or contemplating the use of manganese will do well to write Messrs. Kendall and Flick, at Washington, D. C., for samples, prices, etc.

At the annual meeting of the stockholders of the Purington Paving Brick Co., at Galesburg, Ill., January 27th, the following directors were elected: D. V. Purington, W. S. Purington, Geo. C. Prussing, S. S. Kimball, W. E. Phillips, F. Y. Matteson and A. A. Smith. After the stockholders' meeting the board of directors met and elected the following officers: D. V. Purington, president and treasurer; W. S. Purington, vice-president and general manager, and Chas. H. Chamberlain, secretary.

Wm. Tallman, Beamsville, Ont., writes that the Beamsville Press Brick Works has been purchased by Geo. Crain, of Brockville, for \$8,020. The purchase included sixty-two acres of fine clay land. Mr. Tallman says that the entire plant, which is under his supervision, will be remodeled and put in shape to turn out a superior quality of pressed brick. He would like to correspond with parties having a good second-hand Simpson or Boyd brick press; also a good second-hand dry pan.

A. H. Newton, of Haverstraw, N. Y., advises us that the long-pending litigation between himself and Mr. Buck has been decided in his favor, and that he (Newton) has the exclusive right to manufacture machines under the patents that were in question. It has been a long and hard fight, and Mr. Newton is much gratified over his success. He now owns and controls nine patents relating to brick-mold sanding machines. The "Champion," as it is now made, he thinks, is the simplest, strongest and most serviceable sander on the market. For further particulars see his ad on page 185 or, better, write him for illustrated circular.

## IN AND ABOUT CLEVELAND.

In this locality the building trades are looking up. The opportunities are better than since '92. 'Tis true, sharp competition has decimated profits, but with the revitalization of the building industry business will again be satisfactory. And such an event is scheduled for '98. No one can mistake the signs.

The demand for paving brick in and about Cleveland will be normal, according to the best information obtainable from local manufacturers and purveyors.

The law and ordinances governing the erection of new buildings within the city fire limits is now being strictly enforced. Brick and other fire-proof material is thus receiving benefits which cannot be calculated.

More business and residence buildings will be erected in Cleveland this year than ever before, and brick will represent at least sixty per cent. of the material provided for in the specifications.

This is practically true of the whole State, as regards the larger cities. There is more activity among brick men, and they are more successful in asserting their claims over stone men than at any prior period. The quarry men are steadily losing ground, and the gains represented by the employment of structural iron, while enormous, are making no serious inroads as yet. It's all due to natural and moral conditions. The superiority of brick as a building material is not to be controverted.

At the local office of the Akron Hydraulic Press Brick Co. things are looking very bright. Their trade is growing steadily as the good qualities of their product are better known.

F. N. Carter says pressed brick in all colors is the up-to-date architectural success.

The Canton & Cleveland Brick Co. are of the opinion that an unprecedented activity in brick commerce is impending.

F. H. Eggers, John Wilson and Knauff & Esterbrook, three leading local brick manufacturers, are getting ready for a big season. The municipal demand for brick will be equal, if not greater, than for any season since '92.

J. W. Hornsey, whose yards are at Collinwood, is making a big success of an impervious shale brick.

Stowe, Fuller & Co., representative dealers, are voicing the opinion that the brick trade, especially modern building brick, will move in unprecedented volume this year. They are agents for the Harbison & Walker Co., Pittsburg, Pa.

The outlook is exceedingly bright and the business already tangible—would justify us to predict a busy and profitable year.—Chas. E. Pope & Co.'s report.

Cleveland is becoming so important as a brick market that all the large manufacturers of the Akron, Canton, Massillon sections and other noted centers are now represented here by agents, either directly or in conjunction with cognate interests.

The abandoned brickyards in the vicinity of Cleveland will soon again be inhabited by the busy worker. For years past they have been the habitat of the tramps.

C. G. Barkwill reports prospects good and business improving in all directions.

The tile trade is good, and while somewhat stagnant during the past season has always been pretty satisfactory. Roofing tile is especially active, J. E. Ewart & Co., of Akron, and Scott A. White, of Pittsburg, furnishing reports of this character. Dakin Bros., large local distributors, say the demand is growing in all directions, the agitation for good roads and perfect drainage furnishing no small impetus.

A. NEWMAN.

## ST. LOUIS NEWS.

The St. Louis Architectural Club has elected Wm. B. Ittner, President; Frank Burford, First Vice-President; H. G. Eastman, Second Vice-President; Emil H. Neimann, Secretary; J. C. Stephens, Treasurer; R. M. Milligan and Benno Janssen, Executive Board.

There is a probability of another coal strike, and the brick concerns are laying in coal ahead; one concern here gave an order for thirty-eight car loads to be shipped at once.

T. P. Plumridge, who has been with the Hydraulic Press Brick Co. for many years, holding a very responsible position, has left them and is now connected with the well-known firm of Evans & Howard.

A. C. Wolfe, of Pennsylvania, has formed a corporation here under the title of the "Western Enamel Brick Co.," with a capital stock of \$50,000. They intend to utilize and develop Mr. Wolfe's processes for enameling, and if the goods manufactured will show up as well as the samples, why, then, they will be in the procession, and right at the head, too.

The managers of the affiliated Hydraulic Press Brick Co. held their annual conference at the office of the parent company in St. Louis on the last day of January. There were about thirty or forty representatives present, and they seemingly had a royal good time.

The American Press Brick Co., at Hewstead and Wabash R. R., have already begun on the season's work, as they have but very few brick on hand. They will have to run their Lion and Ross-Kellar presses to their full capacity to catch up on the sales.

The Fernholtz Brick Machine Co. report the sale of three presses, one to a local concern, one to Texas parties and one to be erected in Mississippi.

According to figures furnished by the "American Land and Title Register," the city of St. Louis ranks fourth in the list of real estate transfers of the principal cities, to-wit:

|                     |              |
|---------------------|--------------|
| New York .....      | \$94,284,663 |
| Chicago .....       | 101,195,213  |
| Philadelphia .....  | 87,958,641   |
| St. Louis .....     | 56,436,427   |
| San Francisco ..... | 15,238,323   |

The following table shows that St. Louis ranks second in the estimated cost of buildings for which permits were issued in the year 1897:

|                  |              |
|------------------|--------------|
| Chicago .....    | \$21,777,230 |
| St. Louis .....  | 9,471,640    |
| Pittsburg .....  | 6,295,118    |
| Detroit .....    | 4,385,840    |
| Cincinnati ..... | 2,485,890    |

Of course, the brickmakers received their share of this prosperity.

After a very lively and spirited competition, the Hydraulic Press Brick Co. managed to secure the contract for the "Brown" building, which will take about 250,000 white-face brick, 150,000 white-enamelled brick and a couple of million common.

The Thomas Press Brick Co., whose main office is located in this city, but with works at Thomas Landing, Ill., inform me that they have put in a complete air plant for mining. They have a fine compressor, two large storage tanks, about 900 feet of pipe line and air drills. This equipment has cut down the cost of coal and clay to half the cost of the former hand-mining method, besides releasing them from the dictates of the miners' union.

The shale brick works at Edwardsville, Ill., thirteen miles

[CONTINUED ON PAGE 166.]



# FOUR STYLES...

— Of "Monarch" Machines for 1898.

...

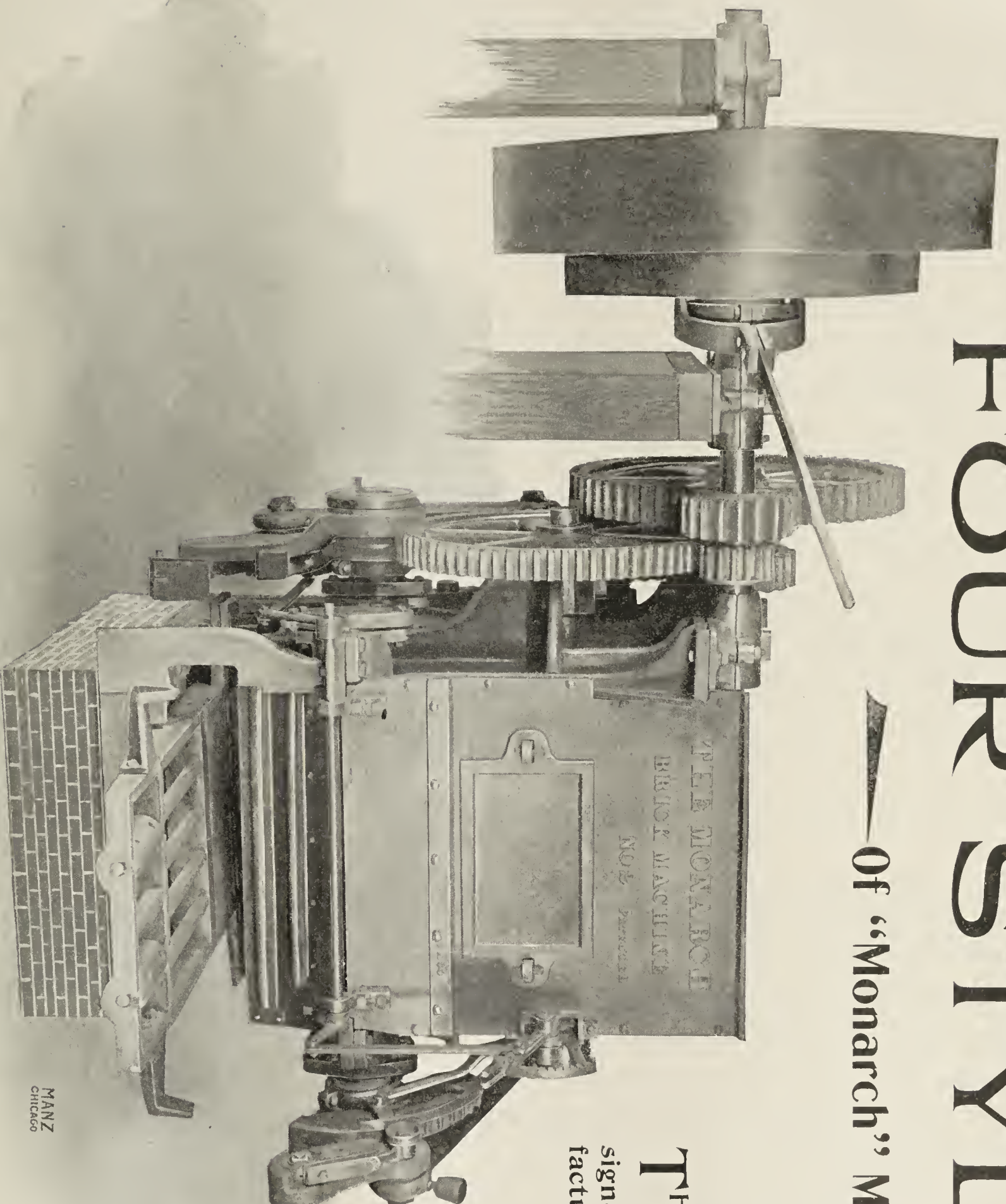
THIS IS No. 2. Has especially wide and heavy presses, designed principally for the manufacture of

## FIRE BRICK.

...

The  
Wellington  
Machine  
Company,

WELLINGTON  
OHIO.



MANZ  
CHICAGO

Write for Particulars.

See Ad. on Page 167.)



## ST. LOUIS NEWS—Continued.

distant from St. Louis, were sold at receiver's sale, W. H. Fizer, of St. Louis, being the successful bidder.

The Superior Brick Co. is increasing the kiln capacity by putting up a series of down-draft kilns of their own design. They are adding a two-mold Fernholtz brick press, to be used for fancy and ornamental brick. They intend to run their Lion presses on standard brick only.

The vitrified paving brick men are all anticipating a very successful season. The city has advertised for about seventy-five parcels of street and alley paving, and it is reported that the city council will bring in a bill to compel the paving of gutters on each side of the street for about three feet with vitrified brick.

The following newly-elected officers of the Builders' Exchange were duly installed: President, H. C. Gillick; first vice-president, L. B. McFarland; second vice-president, H. L. Block; directors, Theo. Stockhoff, Patrick Mulcahy, Stephen O'Connor, Thomas J. Ward, F. P. Hunkins and T. F. Hayden. C. E. McEwing, of the brick firm McEwing & Thomas, has been placed on the arbitration committee of the Builders' Exchange.

A special meeting will be held in this city in February by the division officers of each state of the League of American Wheelmen. The L. A. W. now has a membership of over 123,000, extending to each State in the Union. One of the objects of the meeting is to discuss the question of good roads. Our vitrified paving brick men stand ready to prove to these people that the only paving material is a good brick, and it is to be presumed that the whole brickmaking fraternity will receive substantial benefit from this meeting. Let the good work go on.

The M. F. Williams Patent Crusher & Pulverizer Co. have entered a patent lawsuit against the St. Louis Pulverizer Co., claiming that the latter concern infringed on the former's letters patent. As it is merely a question of construction, it will not take very much testimony to fight the case. Mr. Williams is very confident of winning his case.

The St. Louis Pressed Brick Co. may experience a strike at their paving brick works at Glen Carbon. The men claim they will not work when the season opens unless they are paid the Decatur scale. As they are affiliated with the miners' union, serious trouble may be apprehended should a strike or lockout occur.

## A NEW DRY-PRESS WITH A GOVERNMENT INDORSEMENT.

FOR SOME PURPOSES, and on some materials, the dry process is certainly the top-notch of brickmaking. There is scarcely a large and successful yard in this section of the country that has not experimented more or less with this system, with varying results. The system itself has been in process of development, and where results have been unsatisfactory it has often been due to the fact that the machinery was either inadequate or improperly managed. A new dry-press is always received with much interest by all progressive brickmakers, and its career carefully watched. Especially is this the case where the machine promises to mark a long step in advance of anything heretofore accomplished by this system.

Such a machine is the Berg brick press, which is being put upon the market by the Chicago Brick Machinery Company, and advertised for the first time in this issue. Although scarcely known as yet, this machine starts out in its career with the indorsement of the highest authorities in the land. We are informed that the United States Government has asked for a model of this machine for exhibition in the Patent Office, the patent authorities stating they consider it the highest exponent of the art of making brick. This makes it doubly interesting to brickmakers.

Though new, this machine is by no means an experiment. Two of them were working on yards near Chicago last season on some of the most difficult clays in a section where the clays are notoriously difficult to handle. The Chicago Brick Machinery Company state that they wanted to do all experimental work themselves in a quiet way near home before putting this machine on the market for general sale. In this way they hoped to avoid the difficulties which usually attend the introduction of a new machine, and generally arise from the machine itself being but half developed. Certainly it is much fairer to the general public that the first and experimental work of any machine should be done at the expense of the manufacturer, not by running a machine in a shop on a carefully-selected and prepared material, but by a practical season's run on a yard which presents more than the usual amount of difficulties to overcome.

With this end in view, the very first Berg press built was put on a yard near Chicago where three other makes of dry presses

had already been tried, broken down under the strain and their use abandoned. The material is considered the very hardest to work in that whole section. Certainly a more severe test for a new machine could hardly have been devised; but we are informed that the Berg press, though placed upon the foundation of one of the discarded machines, never caused a delay of five minutes to the yard, nor a dollar's worth of repairs; in fact, not even an adjustment was made on it after it started until the yard closed down for the season. This is an almost phenomenal record for a machine of any kind.

Although the frame of this machine is similar to that of some of the older types, its movements are entirely original, and we are told that the patents have been submitted to several of the best patent experts in Chicago and passed upon most favorably.

Simplicity and strength have been the first points considered in this machine, and have apparently been carried to the highest degree of perfection. In fact, the Chicago Brick Machinery Company claim this machine to be absolutely unbreakable in legitimate work—a pretty big claim for any machine, but they say they are ready to demonstrate it.

To the readers of the Clay-Worker who attended the Convention at Pittsburg this machine needs no introduction, as Mr. Moroney had with him a beautiful little working model of it, nickel-plated throughout. With this he attracted a good deal more than his share of attention; in fact, it was the sensation of the exhibition room, and Mr. Moroney was surrounded by a crowd of interested observers most of the time.

The Chicago Brick Machinery Company invite correspondence with every one who is thinking of putting in a dry-press this coming season, or who is interested in any way in the dry process of making brick. They say they can promise some highly interesting developments and many new features, and believe they can convince every brickmaker that this machine is indeed the "highest exponent of the art of making brick."

## AN ARTESIAN WELL SPOUTS CLAY.

The Government artesian well at Lower Brule Indian agency is a freak that is puzzling the geologists of the Northwest, so writes a Chamberlin, S. Dak., correspondent to the Chicago Record. Originally the pressure threw the solid six-inch stream of water to a height of twenty-one feet above the top of the wall casing. Soon after the wall was completed the pipe would become choked and at such times the water would not flow for two or three days at a time. Then without apparent cause the pipe would suddenly become clear and the water would again spout to its former height. After continuing for a few days, during which time it almost constantly spouted large quantities of sand, the water would once more become choked and cease to flow. This became so frequent and so regular that in time the agency authorities became accustomed to it and paid no particular attention to the freakishness of the well, which is constantly under their observation.

But now the matter has taken a new and more peculiar turn. Arrivals from the agency say that beginning about three weeks ago the well at intervals has been forcing out apparently endless quantities of blue clay. This in itself is nothing strange, but the manner in which the clay is conveyed to the surface is out of the ordinary. The blue clay entirely fills the six-inch pipe during the temporary eruptions, and arises slowly above the top of the casing, exactly as sausages emerge from a sausage machine, until the top is so high in the air that it becomes overbalanced; then five or six feet of the length topples over on the ground. The continued upward movement of the clay in a few minutes causes more of the column to topple over. This has continued until circular pieces of the blue clay aggregating several hundred feet in length have been deposited on the ground in the vicinity of the well, necessitating the employment of men to remove the huge deposits before the top of the casing should become completely buried. The discharges of blue clay are accompanied by very little water, and the clay, probably from a great pressure required to force it through the well casing, is always hard and dry. Another peculiarity is that these eruptions invariably begin a short time prior to the advent of windy or stormy weather, and continue until the weather again becomes settled.

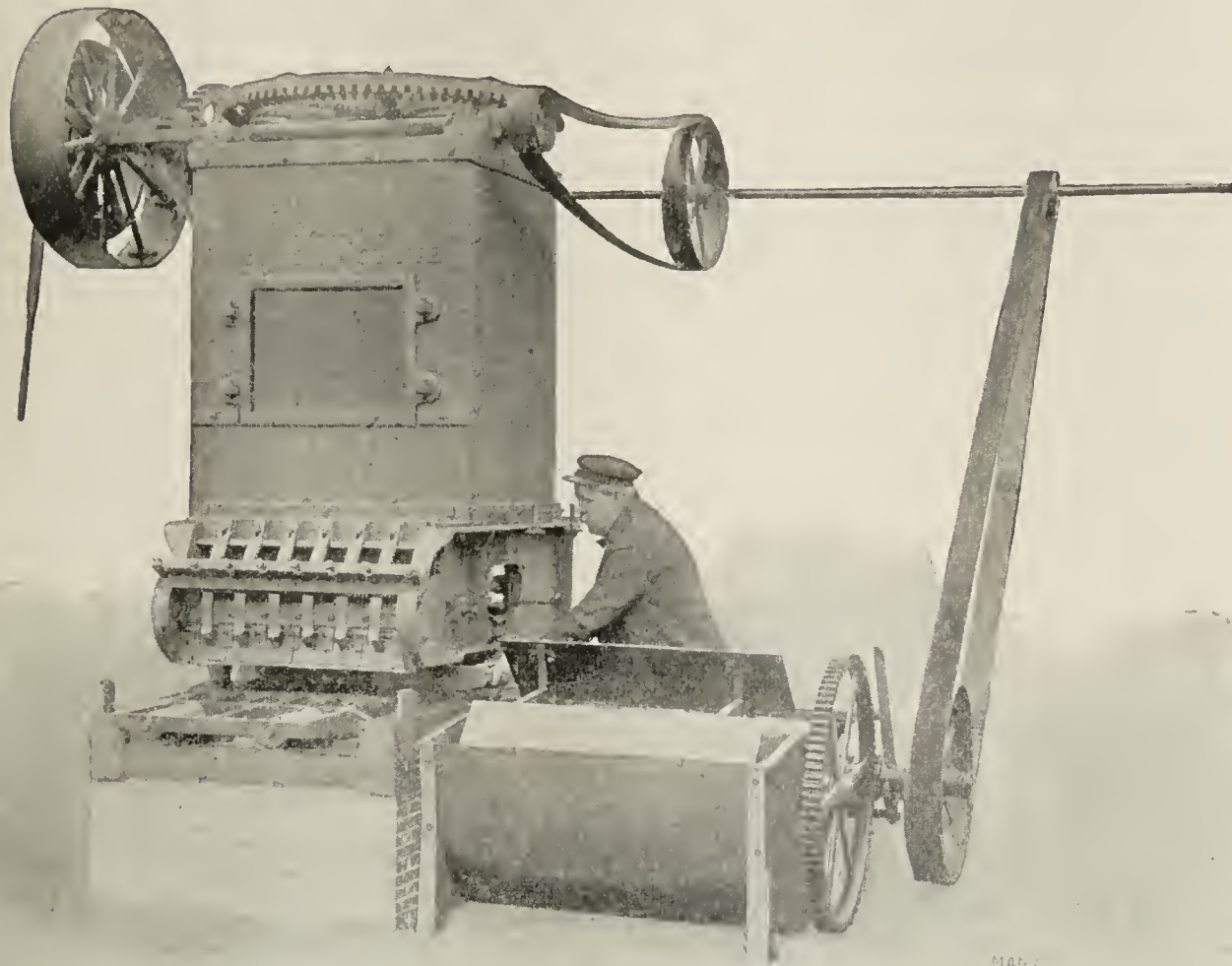
Charles Early, Northport, Wash., will be pleased to receive catalogue and prices of soft mud brick machines.

J. F. Thompson & Sons, Fortuna, Cal., write that they would like to hear from some of our readers or advertisers relative to the best and handiest dumping-wagon for hauling brick. They are in the market for something of that sort.

William C. Benbow, Windom, Minn., wants to purchase a second-hand Martin steam-power brick machine. Anyone having such a machine will please address Mr. Benbow direct, giving full description of machine, number of years in use, daily capacity, etc.



# The "IRON QUAKERS."



Better  
Than  
Ever  
For  
1898.

The Extra Heavy Steam Power "Iron Quaker" Brick Machine, (with Friction Clutch Pulley) and "Wellington" Mould-Sanding Machine.



**Our Horse-Power Machine** Is the most generally used of any. This tells the story. It is the simplest best and lower-priced than any competing machine **HAVING EQUAL MERIT.**

## Auxiliary Machines and Supplies.

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

### Ball-Bearing Brick Barrows and Trucks.

No one else makes them.

### FOR SALE.

Odd sizes of moulds. Have not been used.  
5 moulds,  $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$ . 9-16 inch partitions.  
20 moulds,  $8\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$ . 9-16 in. partitions.  
17 hand moulds (3's) standard size.  
Second-hand, but used a few days only.  
10 moulds,  $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$ .  $\frac{1}{2}$  inch partitions.  
19 moulds,  $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$ . " "  
16 moulds  $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$ . 9-16 inch partitions.  
16 moulds  $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$ . 9-16 inch partitions.  
10 moulds, standard size.

**The Wellington  
Machine Co.,  
WELLINGTON,  
OHIO.**

Send  
for  
Circular.

See ad. on page 165.



## BUTTONHOLE TALKS.

"EVERYONE HAS REMARKED, with surprise, at the intelligence of the men in these conventions, Gates, and if they could only chain you up and keep you out of sight, they would have no end of these compliments. Even with you around there are enough of the good to overshadow and do away with the cloud of your presence."

I was tired out and worn out, and it seemed to me mean for him to take advantage of me in this way, so I tried to escape to my room from the lobby where he had caught me, but he would not let me go.

"Hold on," said he, "I have an idea I want you to grapple with, and will come right to it. How is it, I want to ask you, that such an intelligent lot of men as these seem to be are all at work at the wrong places? It's a fact, sir; the only really fit and proper places for brickyards to-day are in the hands of the discoverers and promoters who own them or control them, but they don't know how to work them. They know they are gold mines, all right; they know that nothing like them was ever before discovered. That each is the only one proper location, having all the proper shipping facilities, and of course that the 'supply is inexhaustible.' They can show samples that are so nice that they have to be kept in a velvet case, and the only thing they lack is the one little insignificant item of personality to attach to all the wealth of opportunity they have gotten and set it going and keep it running. Of course, they want an official of a bank connected in some way, but that is understood to be a standing requirement and always has to come sooner or later. They have gotten all the requirements but the man, but they can't get the man because the men that know the business are all located in the wrong places, and are anchored so well that they can't get away.

"Anyone and everyone who is in any other line of business knows intuitively that there is the biggest kind of money in clay. Men who have spent their lives in the grocery business or the dry goods business, as well as literary men and doctors and lawyers, have just jumped at the chance of getting into the clay business, of putting in their savings and earnings with the promoter's gall and smooth talk, all because the product was to be made from material that didn't cost anything. Like a gold mine where there was really gold, just had to dig it right out of the ground, and then touch it up with just a little cheap labor and cheaper fuel, and the buyers would 'come a-runnin', don't you see, don't you know.' They have the only really truly genuine place to manufacture, the really only inexhaustible bed of naturally pure, absolutely incomparable clay, or rather an option on it, which is speedily closed by the front rank of the army of dollars, after which they will hereafter send such endless arrays of reinforcements.

"Then they will get cranks, which will operate not only on the machinery, but all over the whole business, and they will begin to grow wrinkles on their faces and smooth spots on their heads, and will begin to find what worry and trouble really are as they go on feeding in the last of the wad of their accumulations from the grocery and the dry goods and medicine and law into the hungry maw of this growing excrescence to the clay bank. They will get so much worry that the days will not be long enough to hold it all, and they will have to use the nights for that purpose, and then they will learn that the main difference between a national bank and a clay bank is that the latter requires more money than the former.

"Then, when they have modified their views, or when the mortgagee has for them; when their clay bank isn't so wonderful; when they have become practical and don't expect dividends, but just to 'keep the old thing running;' when their cravings are satisfied with johnnie cake and spring water instead of terrapin and champagne; when they join the army who have the worst location, the meanest clay and the crankiest machinery—then there will be hopes for them to reduce their capital stock to some figure low enough to allow some hope of dividends and join our army indeed, and go ahead and work out their salvation.

"But no one should be discouraged because he hasn't the right place, for we are all in that boat, you know. Why, I heard a couple of the fellows talking a little while ago, and one was telling the other that his works were situated off to one side; no good shipping facilities; fuel was dear and his clay wouldn't work, and he had to ship in clay, and there really

wasn't any good place in reach to sell his output anyway. The other fellow slapped him on the shoulder and whispered in his ear: 'Brace up, old man; we're all in the same boat; none of us are in the right places, and all of us are in the wrong places, and the only fellows in the right place don't know how to make brick, and when they do learn how to make brick they will find that they, too, are in the wrong place.'"

GATES.

## THE CERAMIC ASSOCIATION OF THE OHIO STATE UNIVERSITY.

THE MEETING of January 18th was devoted to the reading of papers by the members. Mr. Watts led with a paper on "A New Muffle Kiln," describing a kiln successfully operated at Zanesville, Ohio. Mr. Post followed with a description of a sewer pipe works in St. Louis, his home city. The last on the programme was Mr. Bleininger, who read an abstract from a German paper on "The History and Operation of the Berlin Mortar Works." All of the papers were discussed.

On February 1st the Association had the pleasure of having as an honored guest Mr. W. D. Richardson, general manager of the Ohio Mining and Manufacturing Company, Shawnee, Ohio. Although the evening was too cold for comfort, quite a number of members and students had appeared. Mr. Richardson's lecture was most admirably adapted to the audience, and eager interest was manifested throughout the talk. Mr. Richardson started out with relating the circumstances which led him to enter the brick business, telling how he started at the bottom. His first experience was on a brickyard working for a dollar per day. Although possessed of a thorough classical education, he found that it helped him little, if anything, in his new career. Classical education does not fit a man for the profession of a brickmaker, nor for any other practical pursuit. The training given by a classical education is of the wrong kind. What the young man needs is a thorough education in mathematics, drawing and the sciences. These give him the proper training. Though it is advantageous for a brickmaker to have a knowledge of art, he is powerless to apply it without interfering with the architect's business. Mr. Richardson concluded, advising the students not to enter the brick business with high-strung expectations, but to be prepared for hard work. For the faithful worker a place is open at a fair compensation. The audience showed its appreciation of the lecture by vigorous applause. The President, in the name of the Association, thanked Mr. Richardson for the good counsel and excellent thoughts expressed in the splendid paper, and for his generosity in helping the cause of the Ceramic Association. The lecture was followed by papers read by Messrs. Fickes and Davis.

## FRENCH PEASANT WOMEN WORKING AMERICAN BRICK MACHINES.

In February, one year ago, the Wellington Machine Company sold one of their "Monarch" machines in France. Two months ago they received the second order, which has been shipped. Also, last fall, receiving an inquiry from Holland, they advised the party to go and see the machine in operation that was working in France. He did so, and reported that he found it making 54,000 per day of twelve hours, and that all the labor around the machine, with the exception of the engineer and the striker, was performed by women, who are French and Belgian peasants. This is quite a common custom in France, he says. This Hollander seems to be something of a humorist, for he says he almost fell as much in love with a sixteen-year-old girl as he did with the "Wellington" Mould Sander she was operating. His order for a "Monarch" and sander has been shipped.

Last June they sold a "Monarch" at Guadalajara, Mexico, and another party from Hermosillo, Mexico, liking it so well, has also purchased. They are also just shipping a "Monarch" machine and "Wellington" sander, and enough other yard supplies to make a full carload, to British Columbia.

Shipping five "Monarchs" to four different foreign countries in six months isn't a bad record, and they give the Clay-Worker due credit for starting the inquiries leading to most of these sales.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker



# A Press with Pressure.

Repeated, long dwelling and rigid pressure are attributes of our Press Brick Machinery. Nothing weak or wobbly. Absolute rigidity, strength and durability. Quantity and quality of product join with price in making this machine the best on the market.

The most important factor in a press is its pressure. Where the clay is right, care and pressure are the requisites for good brick. Our presses, exerting 125 tons pressure to the brick, are given a long-dwelling impression, followed by a quick release and a second and longer dwelling pressure. During a complete revolution of the machine, the pressure is on four-fifths of the time, the double pressure, both top and bottom, being important. Another feature is the ability of the operator to quickly regulate the thickness of the brick, a great labor saver and convenience for making both common and face brick on the same machine.

## BUILT RIGHT

....and....

## RUN RIGHT!

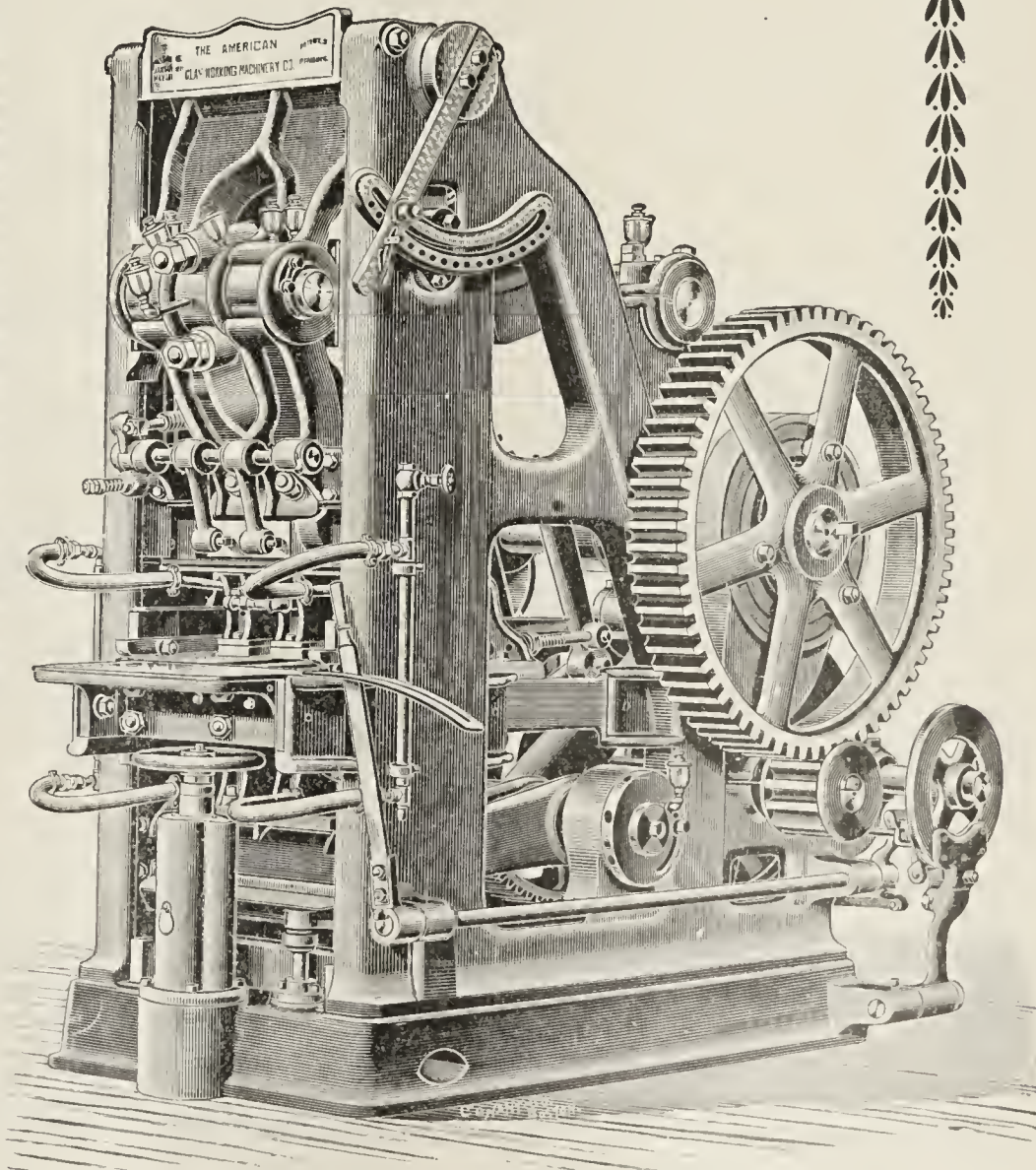
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This machine, arranged to press four brick at a time, is a large and most powerful one. Unusually large steel shafting is used, gearing extra heavy and of most improved type; machine back-geared 28 to 1 and provided with a friction clutch pulley, 36 inches diameter, 8-inch face; speed, 225 revolutions per minute for an output of eight molds per minute. Ten horse-power required. Capacity, 2,000 per hour.

The American Clay-Working  
Machinery Company,



Bucyrus, Ohio, U. S. A.



4-Mold Press Brick Machine, D-4 Model, Style "P."



Written for the CLAY-WORKER.  
THE NEW YORK MARKET.



WIDWINTER and the systematic brick-maker knows whether his books showed a balance for or against him for the past year's work.

"Misery loves company" is an old saying. As the readers of your last number read the open confession of Mr. Purington, that his firm had lost money the past year, if there is any comfort to be

gained by the thought that a concern which can turn out fifty to sixty millions of brick a year, with all the labor-saving devices, admits to a loss, why the little fellow will feel better over his losses. As the cry of, "Why do you not put in a modern plant; then you will make money," he now has it in cold type the fact set before him that it is not all in the plant that makes the money. It would not have been believed by the readers of the Clay-Worker, had it come from any other source, that had the plant been run to full capacity, the sheriff would have been in charge. There is no doubt, as Mr. Purington says, that where there is a stock company the report which is placed before the stockholders is fixed up so that a plant is made to show a dividend by the many ways that such things can be done, with the result that a great many of the best-equipped plants in the country have become, as one of your correspondents put it, monuments of departed capital.

It will be a surprise, no doubt—it certainly was to me—that there were only three hundred million of brick used in Chicago last year. It would seem that the yards with a productive capacity of a thousand millions of brick, the owners must have had by the time they were ready to start evidence by the number of permits (I take for granted that they have a department of buildings, as in New York City), for the first three months of the year, as they are the ones in which the greatest number are issued, to form a basis to work on. The Hudson River manufacturer has this information as a basis, but, I am sorry to say, does not use the information to benefit himself as well as the trade. It is a relief to know that the tide-water brickmakers of New York and New Jersey are not the only ones who rush on regardless of danger signals to the welfare of their pockets.

Some time ago I placed before the readers of the Clay-Worker what was supposed to show what a great reduction there was in the number of brick on hand. As then stated, when the returns of stock marketed and on hand would be known at the first of the year, there would be a surprise in store as to the number. As your readers compare the stock on hand they will find that the supply and demand does not vary much.

—Size of Brick.—

As one of the gentlemen at the Illinois Convention said, he did not think the brickmakers were smart, because they made too large a brick. It has always been expected in this part of the country that the builders would call for a larger brick and a uniform size one. When you see a buyer walk over the cargoes of brick in market and lay his rule on five brick, you can depend upon it that the barge which has the largest brick, other things considered, will be the cargo he will buy. The past summer in our local trade one of our yards made the smallest, and he did not sell any around town. He then had a new set of molds made last winter, making the largest. At once the builder who had the largest amount of work became a purchaser, leaving those he had been dealing with for no other cause. The difference in the size meant money in his pocket. It has been tried by many to make small brick, and there are cases where yards have been leased, the owners of the clay and sand wanted to name the size of brick to be made, but it wasn't a go.

—Wide Tires.—

And their use is to be commended, if only on dirt roads. New Jersey has a State law in regard to them, but gives each township the right to make it compulsory and enforce the law. Any wagon which loads fifteen hundred cwt. or more must have not less than three-inch tire. All the brick wagons have

them, only they are four inches in width and all track. All brickmakers know that where one sells brick in a country town he has all kinds of roads as well as places to draw his load. The teams here, not the down-east team, which is a horse and wagon, but a pair of horses, draws twelve hundred and fifty brick to a load, whether it is one mile or five. The drivers pronounce the wide tires just the thing, as they say, in many places if we had the narrow tire we could not get through the road, as the wagon used is what is called the lumber or farm wagon, without a box. The bottom boards are six inches wide, so that if they want to dump the load they remove one side and just pull the first bottom piece out, and so with each one, no nails are used; the front and tail board is loose as well as the sides. They also use short spiral springs, so that the brick ride better, do not chafe or rub, is easier on the horses as well as the man who drives the load. The clay carts have all four-inch tires. We heard one gentleman say that he could get a set of wide tires for fifteen dollars. This certainly would not be a very expensive experiment. Here it costs \$20 to have new rims put on old spokes and hubs with one-half-inch tire, and a new set all through costs from \$46 to \$48 per set.

—Stock of Brick on Hand.—

At points of shipment is larger than many supposed, as it was taken for granted that the wet weather during the summer had reduced output—but somehow the brickmaker manages to get there and stay there, so that when the round-up occurs at the first of the year it is found that the output is as large as usual. The past year the molding season began about a month earlier than '96 and a month later with yards running which had lain idle the season before.

|                                  | Jan. 1, 1897. | Jan. 1, 1898. |
|----------------------------------|---------------|---------------|
| Haverstraw Bay .....             | 76,000,000    | 79,000,000    |
| Other points on Hudson River.... | 109,000,000   | 94,500,000    |
| New Jersey .....                 | 35,000,000    | 37,500,000    |
| Staten Island .....              | 3,000,000     | 2,000,000     |
| Long Island .....                | 8,000,000     | 7,500,000     |
|                                  | 235,000,000   | 220,500,000   |

On the first of the year about fifteen million less. Strange as it may seem, since '94 there has been a falling off each year in the number at sheds, and no shortage of brick between stopping and beginning to make and, with the exception of this year, January 1st, the price has fallen off.

On Hand—1894, 283,000,000; 1895, 243,000,000; 1896, 233,000,000; 1897, 235,000,000; 1898, 220,500,000.

'Ninety-six should be credited with fifteen millions in market on barges.

Price—1894, pale, \$2 and \$2.25; N. J., \$4.50 and \$5.50; N. R., \$5.50 and \$6; 1895, pale, \$2 and \$2.50; N. J., \$5 and \$5.75; N. R., \$5.50 and \$6; 1896, pale, \$1.75 and \$2.25; N. J., \$4.75 and \$5.25; N. R., \$5.12 and \$6.25; 1897, pale, \$1.75 and \$2.25; N. J., \$4.25 and \$4.50; N. R., \$4.25 and \$4.75; 1898, pale, \$3.50; N. J., \$5.50 and \$6; N. R., \$5.75 and \$6.

When the rates of January 1, 1897, are compared with January 1, 1898, pale show an advance of \$1.50 per 1,000; North Rivers, \$1.25 and \$1.50; New Jersey, \$1.25 to \$1.50. If that advance could have been split in two during the summer when the largest part of the brick are shipped, '97 would have shown a gain.

Maximum rate, 1897—Pale, \$3.50; N. J., \$5.50 and \$6; N. R., \$5.75 and \$6. Minimum rate, 1897—Pale, \$1.25 and \$2; N. J., \$3.25 and \$4.25; N. R., \$3.87½ and \$4.50.

Think of North Rivers selling for less than four dollars. Will it be a lesson the coming year? The price is higher at present and a comparative mild winter, brick being laid and shipped as well, with each week bringing the season of making nearer at hand and some will be molding just as soon as they can.

—Projected Building.—

For January, in New York City, 199, to cost \$6,739,450.

For January, 1897, in New York City, 274, to cost \$7,185,400.

The first month in the year shows a falling off in number as well as cost. If there isn't a strong rally in the next two months, it looks a big supply and the same demand as last year.

Brooklyn—January, 1898, 318 buildings; cost, \$1,353, 671.

January, 1897, 206 buildings; cost, \$653,580.

An increase in permits and about seven hundred dollars in value. If the time ever comes that Brooklyn builds all brick houses, she will become a factor in the trade.

—The Brick Market.—

When last I wrote there was a market, but points of shipment were closed. It seems that the brickmaker was not to be





# A Cat Has Nine Lives.

THERE IS AN OLD TRADITION which says: "a cat has nine lives." We don't know that it is so but we have all heard it so many times that we have come to believe it. There are things more certain than the life of a cat—for instance take the EAGLE REPRESS, it will out last a dozen or more cats. Nothing but fire will knock it out. Just look what people who are using them have to say, then you will know that we do not say anything too strong in favor of the EAGLE. We have hundreds of testimonials on this machine. Here are a few. If you want more send for them.

## DOES MORE THAN CLAIMED.

*The American Clay-Working Machinery Co., Bucyrus, Ohio.*  
Rome, Ga., Jan. 31st, 1898.  
Gentlemen:—You ask our opinion of the Eagle Repress? We are pleased with it. We purchased it advisedly, for we examined the merits of quite a number of re-presses that we had in view, and wrote to our friends in different sections to get their opinion also. The preponderance of evidence was in favor of the Eagle, and we had no doubt of the results before we ever started it up. The arrangement is simple and the working parts easily comprehended. We have not run ours regularly, but long enough to demonstrate that our repairs on same will be light for some time to come. We unhesitatingly state that the Eagle does all and more than you claim for it. Yours very truly,  
H. H. McCLURE, Sup't. and Mgr.

## RUNS EASY, WEARS WELL.

Trimble, Ohio, Feb. 2, 1898.  
*The American Clay-Working Machinery Co., Bucyrus, O.*  
Gentlemen:—Replying to your letter of Jan. 27th. We consider the Eagle a very good repress and if buying another repress, would probably buy an Eagle. Our Repress runs easy and wears well, and is strongly built.  
Yours very truly,  
THE TRIMBLE BRICK MFG. CO.

## ALWAYS RUNS WELL. NO REPAIRS.

*The American Clay-Working Machinery Co., Bucyrus, Ohio.*  
Ottawa, Ill., 1-31-98.  
Gentlemen:—Replying to your inquiry as to our opinion of your Eagle Power Repress, would say that machine has always worked well and given satisfaction. It is strong and heavy and never gets out of order. We have pressed many hundred tons of brick with it, and have not as yet spent anything for repairs, excepting for dies.  
Yours truly,  
OTTAWA FIRE CLAY & BRICK CO.,  
By W. W. Nash, Secy. & G. M.



## BUILT RIGHT. RUN RIGHT.

## A RAYMOND THROWN OUT. "HOT STUFF."

Charleston, W. Va., December 23, 1897.  
*The American Clay-Working Machinery Co., Bucyrus, Ohio.*  
As to inquiry asking us how we like the Eagle Repress will say; The Press is a first-class machine in every respect. Will make 25,000 good repress brick per day, and not the things like we used to make with the so-called represses that we threw out when we purchased the Eagle Press from you two and a half years ago. We never have paid a cent for repairs. Eagle is the only repress that we know of that is worthy of the name.  
Very truly,  
KANAWHA BRICK CO.,  
Per Wm. D. Isaac, Supt.



## SEVEN YEARS CONSTANT USE. NO REPAIRS.

*The American Clay-Working Machinery Co., Bucyrus, Ohio.*  
1-31-98.  
Gentlemen:—Your letter received. In answer will say we have used the Eagle Repress almost continually since we bought it, about six or seven years ago and have never been at one dollar expense on it except for dies. I think it the best repress I ever saw for repressing for Street paving purposes. I am yours for repress-  
E. G. GRANT.

## DOING BEATS PROMISING.

## JUST STARTED BUT LIKE IT.

Des Moines, Iowa, 1-29-98.  
*The American Clay-Working Machinery Co., Bucyrus, O.*  
Gentlemen:—The Eagle Repress we recently purchased from you has been in use about three weeks and is giving the best of satisfaction. We are very much pleased with it. Yours truly,  
CAPITAL CITY BRICK & PIPE CO.  
J. C. Mardis, Sec. and Treas.

## MAKES PERFECT BRICK. NO BREAKS.

*The American Clay-Working Machinery Co., Bucyrus, Ohio.*  
Ashmore, Ill., 1-28-98.  
Gentlemen:—The Eagle Repress that we bought of you two years ago gives perfect satisfaction. We haven't had a break, and it is easy to handle and will press brick as fast as they can be handled and make them as perfect as they can be.  
Yours truly,  
H. A. OGLE CO.

The American Clay-Working Machinery Company, Bucyrus, Ohio, U. S. A.



avored in the way of weather, as in two weeks' time navigation was open from Newburgh, all Jersey, as well as Long Island, and how they did ship them in, so fast that there were 71 barges in market at the close of the third week in January. Hackensack is again shut out, as the law gives the railroads the right to close the bridges after the 26th of the month for repairs, and whether they make repairs or not they will not be opened up again until time is up. At present writing the river is closed with ice. The Hudson has been so that the towns have been able to bring barges from Haverstraw.

The last week of January 26 barges came on the market, of which 18 were sold for \$6 and \$6.25 and \$6.37½. The great question with many is, will I ship as soon as I can, or will I hold till between old and new brick? Well, it looks as if the buyer is going to get the best of it int he long run, as the rush to market will not beat the rush to get to making. The rate will, no doubt, reach \$6.50 if this snap closes the Hudson.

A. N. OLDTIMER.

#### PACIFIC COAST NEWS.

The various pottery works are experiencing a quiet season, but a feeling exists that an improvement will soon take place, as the general tendency in the various trades is of an improving nature. Klondikers are departing by hundreds, and San Francisco is receiving a large share of the outfitting trade, which in itself is an important factor towards building up trade conditions. The country is somewhat the worse for want of rain, which is scarce this season, and unless a downpour comes soon crops will be damaged.

A good deal of work is being done at present at the Yaeger mines, in Trabuca canyon, near Santa Ana, Cal. An extensive plant has been taken to the mines and is now being placed. The Bean process will also be installed, and for this purpose a brick kiln has been set up, in order to make the brick for the foundations and the walls. Bricks are now being turned out and prove to be of a good quality.

The Co-operative Brick Co., which has been organizing for

the purpose of making brick on the Moss tract, near Stockton, Cal., is about ready to begin work. Machinery has been ordered in the East, and the yard will be in operation in about sixty days.

The Pacific Clay Manufacturing Co., of Corona, Cal., will shortly put in some new and valuable machinery.

A first-class quality of brick clay has been found on the Mason-Webb tract, near Jackson, Cal. It is said to be entirely free of sand. It is likely that this clay will be used very soon.

As soon as the weather settles James Thompson & Son, of Fortuna, Cal., will commence to make a larger number of brick.

A kiln of 200,000 brick is now ready for use at the works of the Alcatraz Co., at Gaviota, near Santa Barbara, Cal., and masons will soon commence on the large brick caldrons, which are to form an important part of the new reduction works to be erected by this company.

Machinery has arrived from the East for the Washington Brick & Lime Co., at Spokane, Wash. It includes one of the most modern apparatuses for the manufacture of vitrified paving brick. A press was also received to be used in manufacturing vitrified tiles for sidewalks, the company proposing to engage in the manufacture of these tiles of various designs. The tiles are 5x10x2½ inches in size. They are either glazed or used in dead color, the difference in the cost between the two being very small. The tiles are placed on a cushion of sand and then tamped into the proper position.

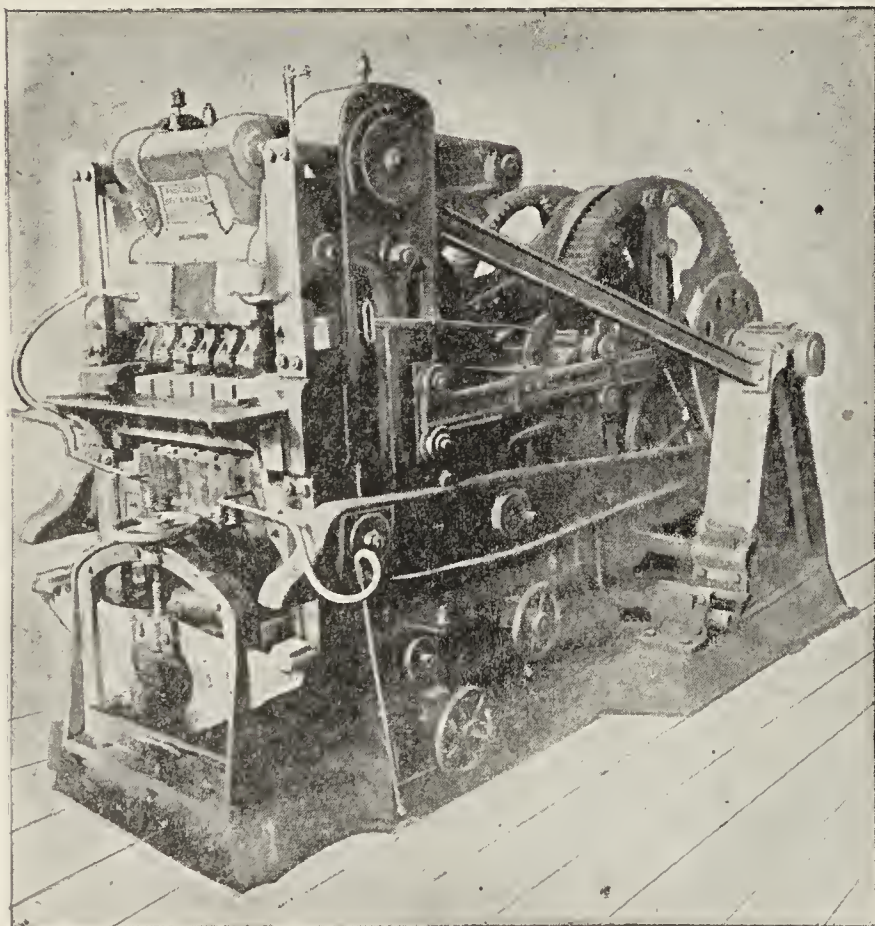
Henry Leyer, connected with the Brick Co., of Monterey, Mexico, was recently in the City of Mexico. This company is turning out a supply of over 100,000 brick weekly, the majority of which go through the City of Mexico for Guadalajara and Vera Cruz.

Capt. E. Parrot is the owner of a fine bed of fire clay, in Pacific County, Wash. An analysis of the clay shows that it contains from 86 to 88 per cent. of pure fire-clay, is well-adapted for pottery purposes and is of great value. Experts who have tested it say that it is equal to the best English article. What is needed is capital to develop the proposition.

The Great Falls, Mont., Fire Brick Co., recently incorporated, has increased its force at the plant, and is running day and night. Considerable capital has been invested by Great Falls and Minneapolis, Minn., men, and it is their intention to enlarge the field of work, and manufacture tile and pipe as well as brick.

SUNSET.

# The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

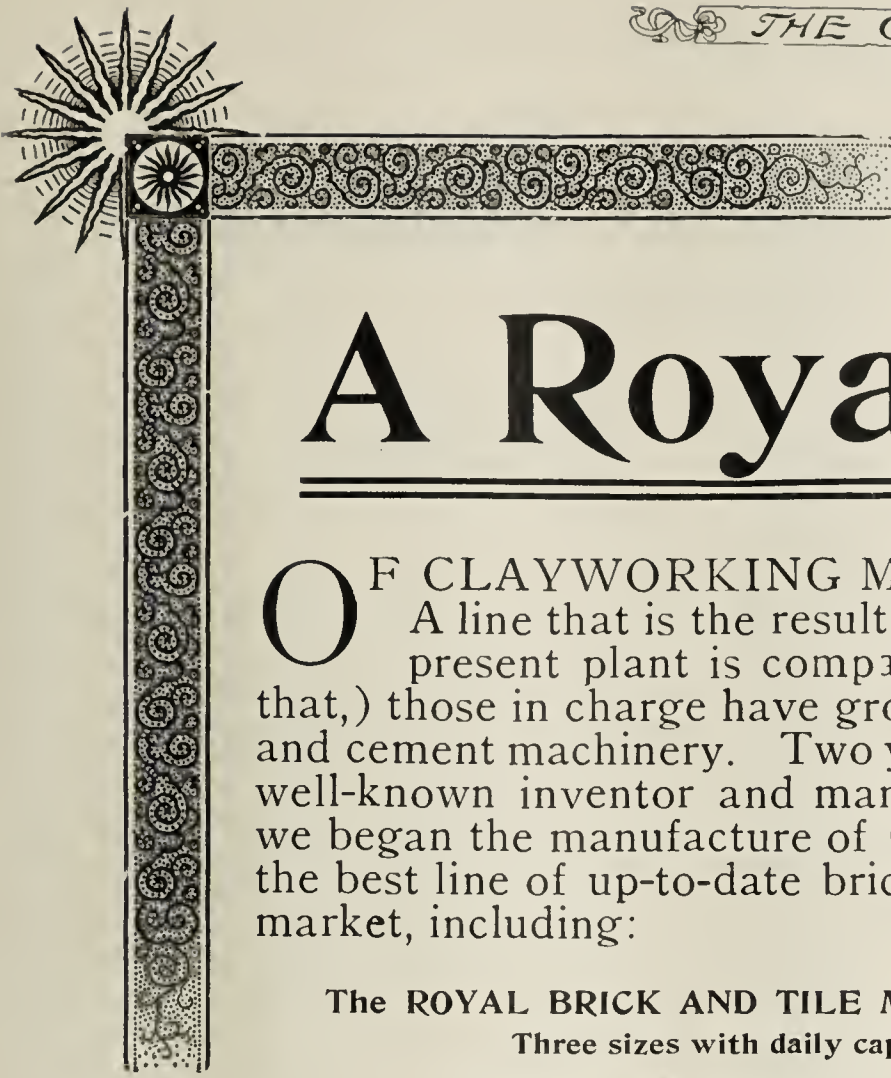
Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE  
ON APPLICATION. . . .

**Progress Press Brick and Machine Co.,**  
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**





# A Royal Line

**O**F CLAYWORKING MACHINERY is the line we now offer the trade. A line that is the result of many years practical experience, for though our present plant is comparatively new, (the equipment is all the better for that,) those in charge have grown gray in the work of designing and making clay and cement machinery. Two years ago, under the direction of Mr. A. Bonnot, the well-known inventor and manufacturer, of Louisville, O., (for a time at Canton.) we began the manufacture of Clayworking Machinery of all kinds, and now have the best line of up-to-date brick, tile, pottery and cement machinery now on the market, including:

**The ROYAL BRICK AND TILE MACHINE,**

Three sizes with daily capacity of 30,000, 45,000 and 60,000 wire cut Brick.

**The ROYAL AUTOMATIC CUTTING TABLE,**

For either side or end cut Brick. The wires move laterally as well as downward in cutting, thus avoiding all ragging.

**The ROYAL CUTTING-OFF DUMP TABLE.**

Which is par excellence for all kinds of heavy blocks, moldings or long material.

**The ROYAL PUG MILL,**

Made in three sizes; 10 ft., 12 ft. and 14 ft. long, single or double gear.

**ROYAL DRYER CARS,**

Flat cars, double deck cars, rack cars of all kinds and of our own make.

**ROYAL DRY PANS,** Any desired size up to 10 ft.

**ROYAL HYDRAULIC PUMPS,** For Filter Presses or Slip Vats.

**ROYAL SIFTER,** Two sizes 24 x 30 and 36 x 42.

**ROYAL DOUBLE and TRIPLE PLUNGER MILL,** Three sizes; all iron and steel.

**ROYAL REVOLVING SCREEN,** That never clogs, being self-cleaning.

**ROYAL JOLLYS,** For from 1½ gallon to 8 gallons.

**ROYAL TUBE MILLS,** For pulverizing clay or cement, built any size, 36 to 60 inches in diameter, 12 to 24 feet in length.

And a full line of Brick and Tile Yard Supplies that are as good as money, skill and brains can produce.

That our Machinery is in demand is attested by the fact that our factory employing thirty hands or more, has been running 10 to 14 hours a day all through the past year. Our machines are sold under a positive **guarantee**. Our facilities for manufacture are unexcelled. If you want anything in the line of Clayworking Machinery, don't fail to get our prices.

## The A. Bonnot Mfg. Co.,

LOUISVILLE, OHIO.

Our motto is not HOW CHEAP, but HOW GOOD, but our prices and terms can't be beat. If you want the BEST MACHINERY for the least money, write us.





# "A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

...

THE accompanying letter from the largest brick-making concern in the World is worthy of serious consideration. . . . . The Hydraulic Press Brick Company never recommend a machine till they have tested it thoroughly and know it to be a COMPLETE SUCCESS. . . . .

...

Office of HYDRAULIC PRESS BRICK CO.,

St. Louis, Mo., October 30th, 1897.

Milton F. Williams, Esq., City.

Dear Sir:--Enclosed please find our order No. 125 for one No. 2 Pulverizer. In a few days, or as soon as our drawings are completed, I expect to give you an order for two more. We have three of your Pulverizers now running, giving perfect satisfaction. We are able to grind Clay to any degree of fineness by making very slight changes in the machine. They have been running several months without repairs worth considering.

Yours truly,

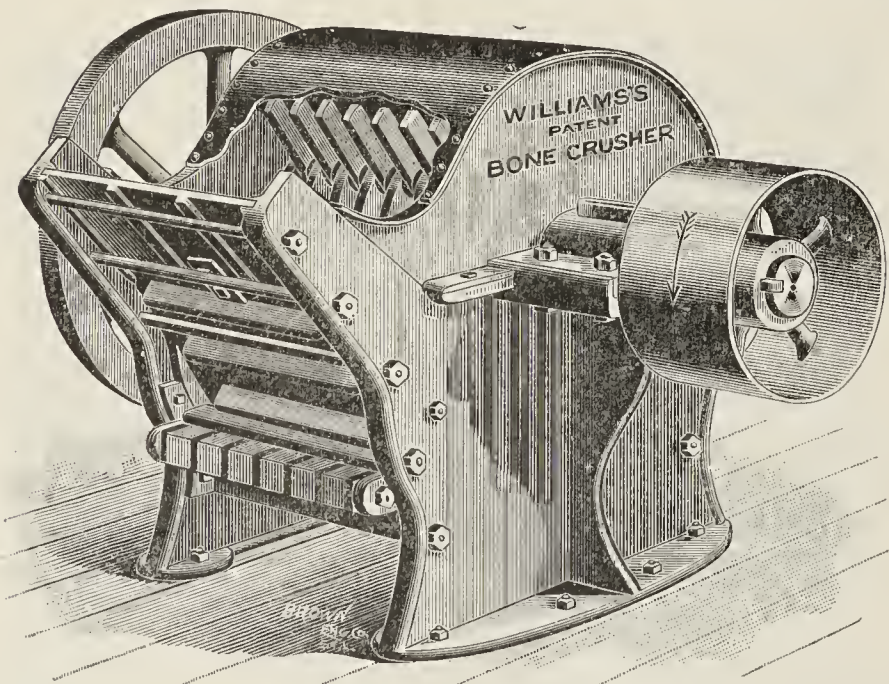
HYDRAULIC PRESS BRICK CO.

W. N. Graves, Gen'l Supt.

We can send you many Similar Letters.

## WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

Our Pulverizer is fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



Williams's Shale Breaker.

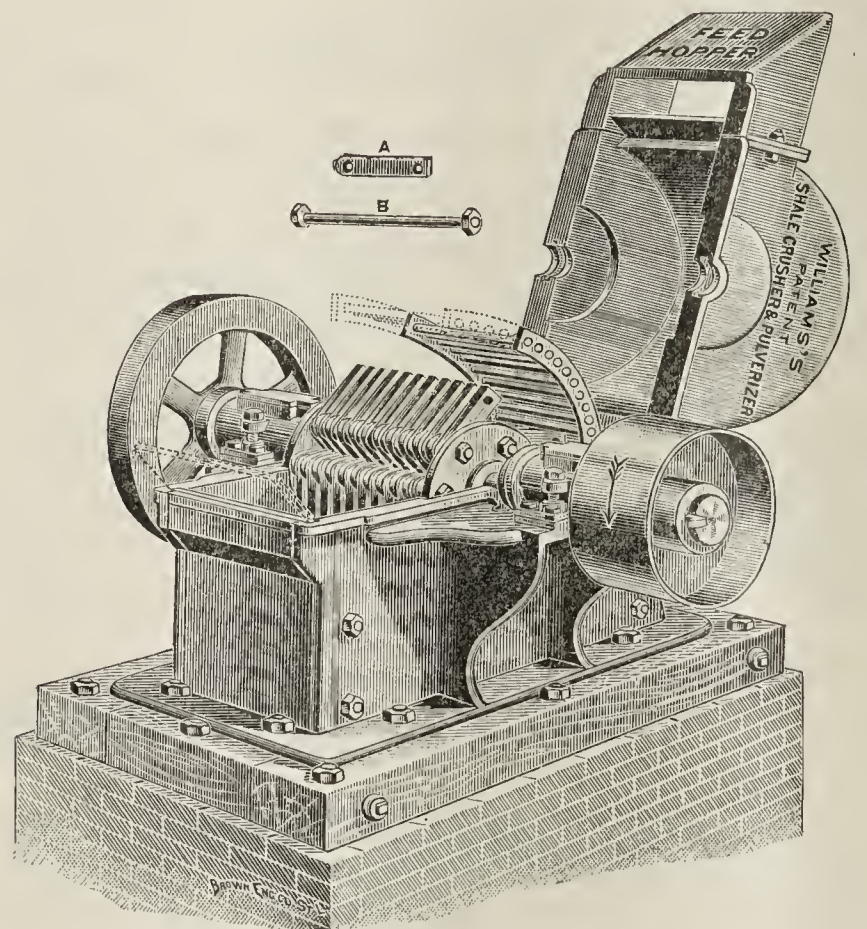
THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

2705 North Broadway, - - St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.



Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.



## BRICK MACHINERY

### Wonder No. 4.

Capacity, 60,000 to 100,000 per day.

### Big Wonder.

Capacity, 50,000 to 60,000 per day.

### Intermediate Wonder.

Capacity, 25,000 to 40,000 per day.

### Little Wonder.

Capacity, 20,000 to 25,000 per day.

## BRICK CUTTERS

### Cunningham's Side Cut

Automatic Cutter.

### Cunningham's End Cut 3-Stream

Automatic Cutter.

### Cunningham's End Cut 2-Stream

Automatic Cutter.

### Cunningham's End Cut 1-Stream

Automatic Cutter.

### Side Cut Broad Delivery Table.

Hand Brick Cutting Table.

### Combination Side and End Cut

Hand Brick Cutter.

## PUG MILLS

### No. 3, Plain Closed Top Pug Mill.

No. 3, Open Top Pug Mill with  
Wallace Patent Cleaner Teeth.

Tempers clay for 75,000 to 100,000 brick per day.

### No. 2, Open Top Pug Mill.

No. 2, Closed Top Pug Mill.

Tempers clay for 35,000 to 50,000 brick per day.

### No. 1, Open Top Pug Mill.

No. 1, Closed Top Pug Mill.

Tempers clay for 25,000 to 35,000 brick per day.

### No. 1, Wallace Patent Pug Mill.

No. 2, Wallace Patent Pug Mill.

Tempers clay for 20,000 to 40,000 brick per day.

## DRAIN TILE MACHINERY

### Little Wonder Makes 3 to 12 inch.

Capacity, 8,000 to 12,000 4-inch daily; others in proportion.

### Intermediate Wonder Makes from 3 to 18 inch.

Capacity, 10,000 to 15,000 4-inch daily; others in proportion.

Drain Tile Cutting Tables for large and small tile  
Trucks for Handling Large Tile.  
Reversing Device for large tile.

## CLAY PREPARING MACHINERY

Dry and Wet Pans, 6, 8 and 9 feet, with wood and iron frames.

Clay Screens.

Clay Crushers and Stone Separators of many designs and capacities to suit conditions.

Clay Elevators all lengths and widths to suit your desire.

Dry Clay Bucket Elevators of length and breadth to suit desires.

Friction Hoisting Drums.  
Friction Geared Hoisting Drums.  
Clay Cars. Truck Wheels and Axles.  
Kiln Doors and Frames.  
Kiln Doors without Frames.  
Wheelbarrows for Brick and Tile.  
Brick Pallet Spring Trucks.  
Engines. Boilers. Pumps.

Shafting, Pulleys, Hangers,  
Couplings, Journal Bearings and  
Belting, both Rubber and Leather.

# A Long Argument



IS NOT NECESSARY TO CON-  
VINCE PRACTICAL BRICK-  
MAKERS OF THE MERITS OF  
OUR MACHINEERY. OUR SUC-  
CESSES PROVE THAT. . . .

## A Case in Point

Is that of the Burnham plant in Milwaukee where we were reported to have made a failure. Under date of October 26th, '97, Mr. John F. Burnham writes:

“You guaranteed the **Big Wonder** to make 50 M brick per day; as a rule we have been able to better that amount by several thousand, and running under favorable circumstances have made as many as 80,000 a day, and you know our clay is very difficult to work. In fact some have said it could not be worked successfully by the stiff clay process—but the **Wonder Machine** is doing it.”

Mr. Burnham's equipment including Granulator, Compound 4-Roll Crusher, Pug Mill, Big Wonder Machine and Cunningham's Automatic Cutter was all furnished by us, and is entirely satisfactory.

Need we say more?

If you want anything in the line of clayworking machinery. Don't fail to get our prices.

# Wallace Mfg. Co.

## Frankfort, Indiana.

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

See Ad. on Page 207.

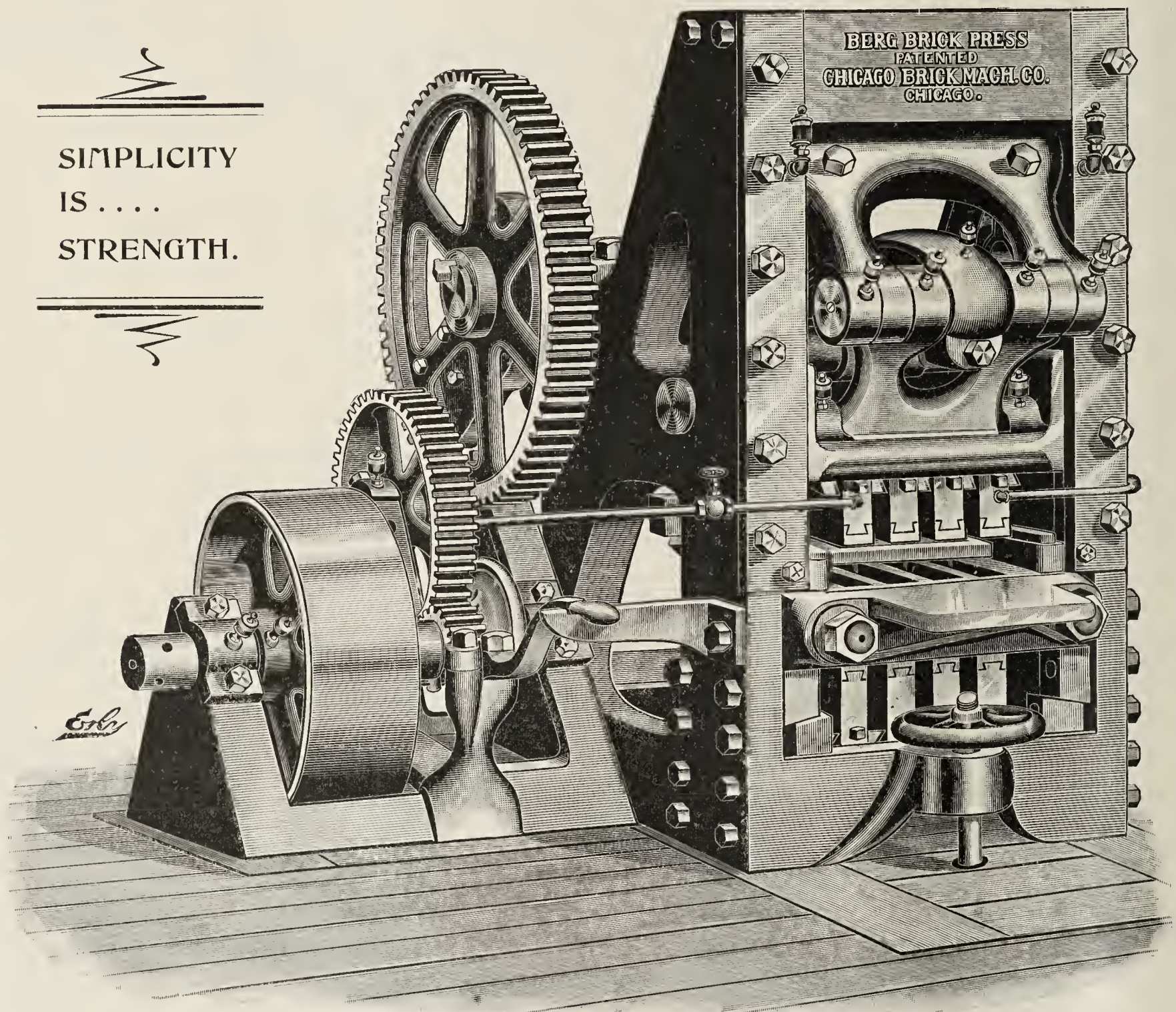


# The BERG BRICK PRESS

Is Pronounced by the U. S. Government—the Highest Development of the Art of Making Brick. . . .

ENTIRELY ORIGINAL IN MOVEMENT.

SIMPLICITY  
IS . . . .  
STRENGTH.



Absolutely Unbreakable.

Fully Guaranteed.

No Experiment, has been running successfully more than a year. Simplest and Strongest of all Dry Presses. Many new features. Send for Circular.

Our Stiff Clay Machinery is just as good in its line as our Dry Press. Most modern in Design and Construction. Makes highest grade of Paving and Building Brick and Drain Tile. Also the latest and highest development of Soft Clay Machinery, combined Disintegrator, Pug Mill and Brick Machine. Only successful down delivery mill for making large tile.

In fact, anything you want—and all Up-to-Date.

CHICAGO BRICK MACHINERY CO., 225 Dearborn St.



# FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

**WANTED**—3,000 second-hand pallets; (sixes). Address OELWEIN PRESSED BRICK CO. 1150p Oelwein, Iowa.

**FOR RENT**—Desirable brick yard on James River, Va., equipped for business. 22 dm T. F. ROGERS, Norfolk, Va.

**FOR SALE**—20,000 second-hand, 32-inch pallets, 2 cents each, F. O. B. cars Wabash. Address, 22 cm THOS. BRIDGES' SONS, Wabash, Ind.

**WANTED**—One number one second-hand Potts Disintegrator, must be in good condition and price low. Address "G," 21 d care Clay-Worker.

**FOR SALE**—I have 115 single deck brick cars, good as new, will sell very cheap. Address JNO. W. BOREN, 21 dm 34 Huffman Ave., Dayton, Ohio.

**FOR SALE CHEAP**—Second hand Brewer brick machine, or exchange for a good second-hand tile machine. Good reason for selling. Address 21 c C. S. SPEESE, Gettysburg, Pa.

**BRICK PLANT FOR SALE**—Well equipped with latest improved machinery, which is new. For particulars inquire of the DANVILLE FIRE BRICK CO., 23 c Danville, Pa.

**WANTED**—An experienced man familiar with burning oil, to superintendent construction of oil-burner plants. Address E. S. MARSHALL, 21 cm 701 Market St., St. Louis.

**WANTED**—A practical clay man to invest \$3,000 to \$5,000 in Roofing Tile and Brick plant in Ohio. A fine opening and will bear closest investigation. Address NELSON, 21 cm care Clay-Worker.

**FOR SALE**—Tile factory in good location with good clay and good trade. Will sell cheap for cash as I want to go out of business. Call on or address JESSE THOMPSON, 21 cm Selma, Ohio.

**FOR SALE OR RENT**—A pottery well located in Kentucky. Equipped with steam power, jolly, kick wheels, moulds, etc. Been running successfully seven years, reason for selling age. 21 cm] STONEWARE, care Clay-Worker.

**FOR SALE CHEAP**—A Dry Press Brick plant near Baltimore. Plentiful supply of clays of finest quality for making red, buff and other colored brick. An excellent chance for some one at small cost. Address 21 d OPPORTUNITY, care Clay-Worker.

**FOR SALE**—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 11 tf d JESSE T. MORGAN, Wilkes-Barre, Pa.

**FOR SALE**—One of the best paying brick and tile factories in Iowa; part pay in good land. Address, PATTON & MUNSON, Lock Box 11, 11 tf dm Lohrville, (Calhoun Co.) Iowa.

**FOR SALE AT A BARGAIN**—One 4-mold Boyd dry press brick machine in perfect condition. THE FERNHOLTZ BRICK PRESS CO., 8 tf l St. Louis, Mo.

**NO DRY PRESS BRICK PLANT** complete without the Carmichael Clay Steamer. T. W. CARMICHAEL, Inventor and Manufacturer, 6 tf d Clarksburg, W. Va.

**WANTED**—Situation by a first-class brickmaker as Superintendent and Burner, press or common brick, would like to go abroad. Understands erecting new plants. Speaks German. 21 c Address F. Z., care Clay-Worker.

**WANTED**—Position as superintendent or burner of dry pressed brick plant by one who is thoroughly practical in every department of manufacturing same. No. 1 reference given. Address ST. LOUIS, 21 c care Clay-Worker.

**WANTED**—Second-hand double die brick press with automatic feed, also automatic brick cutter and separator for end cut brick. State maker, how long in use and lowest spot cash price. Address WM. TAYLOR, 21 d Carleton, Place, Ont. Can.

**FOR SALE**—Licenses to erect patented continuous, combined, continuous and single kilns, muffle, up, down and connected kilns, for burning all grades of goods; fire, common and other brick, terra cotta, etc. Large or small plant. DUPLEX KILN CO., 21 cm Perth Amboy, N. J.

**FOR SALE**—Only steam power building brick yard in live Illinois town of 6,000. Established trade, with annual sales of 500,000 and upwards. Owner not a practical brickmaker and has other interests requiring his time and attention. For sale at a bargain, half cash, half brick from yard. Address DRAWER K., 21 dm Macomb, Ill.

**FOR SALE**—Brickyard located at the junction of the C. & N. W. and Soo railway in Delta County Mich. Only yard within 125 miles, can ship by rail or water, best quality of clay and supply unlimited. 32 h. p. engine and boiler, capacity of yard 30,000 per day. Will sell part or whole interest, as owners cannot give it personal attention on account of other business. We have a good local trade worked up and will give the right party a bargain. Address 2 tf dm A. R. M., care Clay-Worker.

THE TROUBLES you have with your clay, machinery or kilns, can be remedied. Consult the TECHNICAL ENGINEER, 12 tf l care Clay-Worker.

**FOR SALE CHEAP**—100 iron, wood-top dryer cars and 10 to 15 thousand wood pallets, used in connection with cars. All in first-class condition. Address PHILADELPHIA, 11 d care Clay-Worker.

**FOR SALE CHEAP**—In southern Indiana, on railroad; a complete soft mud brick plant. Capacity 30,000 to 40,000 per day, two clamp kilns capacity 350 M each. Address 21 l H. E. N., care Clay-Worker.

**FOR SALE**—At your own price. Penfield Upright Stock Brick Machine; independently geared Pug mill. Machine good as new. A great bargain. Address CEDAR FALLS BRICK & TILE CO., 22 d Cedar Falls, Ia.

**FOR SALE**—Half or whole of well-equipped brickyard in prosperous district and near the busiest 8,000 town in northern Michigan; steam power, 20,000 a day. Address "BRICKYARD," 13 cm 432 S. Jefferson, Saginaw, E. S., Mich.

**WANTED**—Situation as foreman or burner, up or down-draft kilns, fire brick, shale pavers, soft mud dry press; (29) twenty-nine years' experience; number one references. Address BUSINESS, 11 c care Clay-Worker.

**FOR SALE**—Brickyard at St. Johnsville, N. Y., complete with down-draft kiln, Freese & Co. Pug mill Auger Machine, boiler and engine, barrows, sheds all complete for business and abundance of blue clay; on easy terms. Must be seen to be appreciated. Inquire of ROTH & ENGELHARDT, 23 cm St. Johnsville, N. Y.

**WANTED**—A position on a dry clay press brick plant, as superintendent, by a German-American possessing good executive ability and a thorough knowledge of clays, pressing, setting, water smoking and burning both up and down-draft kilns; good references. Address SILICATES, 11 t care Clay-Worker.

**FOR SALE CHEAP**—For Simpson, Boyd and Penfield presses twenty pair of new and second hand plunger feet for making shape brick, twenty-one ornamental shape molds, also two iron planers, one with liner, grinding attachment. Address ERVIN SPECIAL MACHINE & TOOL CO., 21 d Cleveland, Ohio.

**FOR SALE**—Brick and tile plant in the South; R. R. switch to kilns, soft and stiff mud machines, Sharer dryer. Clay good for front brick and fire proof wares. Growing market from wide and prosperous territory. Will sell entire plant, or machinery alone. Will sell part interest with management to right man. Address G. P. ORENDORFF, 2 tf d Lacon, Morgan Co., Ala.

**FOR SALE**—One nearly new 4-mold Boyd Dry Press brick machine; one 4-mold Eureka dry press brick machine; one No. 2 Worrell clay dryer; one 48-inch Ross disintegrator; five second-hand horizontal boilers, 15 and 16 ft lengths, 3-inch tubes, ranging from 50 to 60 h. p., 5 and 6 foot diameter; one straight line engine, 14 x 14 cylinder, nearly new, a No. 1 order; 8 fans, 7 ft. diameter, good as new. Will be sold very low. Address C. SIEDLER, Pres., 2 tf dm 156 Fifth Ave., New York.

## A BIG BARGAIN.

For sale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address WALLACE, 7 tf d care Clay-Worker.

## ENGLISH PLANS FOR PLASTIC BRICK WORKS.

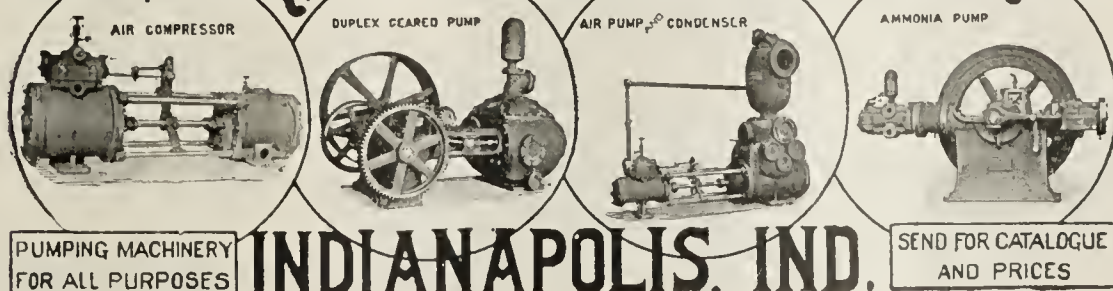
Complete sets including general plan and elevation of works.  
Plans and sections of machine room.  
Plans for Dryer heated with waste gas from boiler.  
Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.  
Prices on application to BENNETT & SAYER, Derby, England.

# NOTICE. Permanent Injunction and an Accounting.

A decree for a perpetual Injunction and an accounting, in the suit in the United States Circuit Court at Cleveland, against J. W. Penfield & Son, has been recently entered, and an **INJUNCTION ISSUED**, restraining the surviving defendant, Raymond C. Penfield from infringing our Patents No. 275,467 of April 10th, 1883; No. 297,671 of April 29th, 1884; No. 297,675 of April 29th, 1884 and No. 362,204 of May 3rd, 1887 (the wheel cut-off.)

CHAMBERS BROTHERS CO., Philadelphia, Penn.

## DEAN BROS' STEAM PUMP WORKS.



INDIANAPOLIS, IND.



FOR SALE.—H. W. CLASSEN & CO., Chas. H. Calssen, Proprietor, Manufacturers' Agents for sale of Sewer Pipe, Fire, Pressed and Paving Brick, Clay Products, etc. Correspondence invited. 305 McElderry's Wh'f (Long Dock.) Box 8, Builders' Exchange, Baltimore, Md.  
13 c

FOR SALE.—One 8-ft under-geared iron frame wet pan; one 6-ft iron frame wet pan; one new 5-ft pan for wood frame; one Potts stock brick machine; one Potts sanding machine; one 7-ft horizontal pug mill; two vertical pug mills; large lot of steel and iron pallets; 20 pallet ears; lot of brick barrows, molds, etc. Address, THOS. CARLIN'S SONS, Allegheny, Pa.  
11 12 c

WANTED.—An expert enameled brickmaker for superintendent enameled brick factory well established; one who understands the business in all its details, as to making, enameling, etc.; state method accustomed to use for enameling, age, nationality, references and where last employed. None need apply unless thoroughly competent. Address S. E. B., care Clay-Worker.  
13 td

FOR SALE.—A complete Brick Yard Outfit, consisting of an A Special E. M. Freese & Co., Galion, O., stiff mud machine, crusher, disintegrator, winding drum with 300 feet of wire cable, clay cars with complete set of shafting, pulleys and being capable of turning out 25,000 bricks a day; also a ten-track Wolff's Chicago steam drier with 165 brick cars, complete with trucks for storing of empty cars, transfer cars, turntables, all ready for immediate use, and can be had at a bargain by applying in person or by letter to J. A. BLAFFER, River Front and Austerlitz st., New Orleans, La.  
[21 d

FOR SALE.—At your own price; one Penfield & Son Horizontal Stock Brick machine, new never used; one Jonathan Creager & Son Grand Automatic Stock Brick machine used 90 days, good as new; one Adrian brick stiff clay machine; four first-class friction Hoisters; 65 double deck Walworth Run dry cars, new; two side-cutting tables; one 85-H. P. boiler and engine; two small boilers and engines; two 40-inch fans, new; lots of 2 15-16 shafting; big lot of doors and grates; one Raymond Hand repress, new; one mould sanding machine; 50,000 W. P. Pallets, new rack for the same. CHERRYVALE VITRIFIED BRICK WORKS  
123 d Cherryvale, Kan.

FOR SALE.—The best equipped Pressed Brick Plant in state of Ohio. Brick have a standard reputation. Finest bed of red and buff clay right at the works. Six down-draft kilns holding 800,000 brick. Daily capacity of presses 30,000. Steam dry house. Kilns have exhaust fan system whereby save about \$2000 per annum in fuel. Best coal \$1.00 per ton delivered at kilns. Cheap labor. Belt line R. R. connects with seven railroads including B. & O. and Pennsylvania system. Largest line of molded dies in the state. Will sell at a great bargain. Correspondence and inspection of plant solicited. Reason for selling, have to move to Colorado on account of health. It will pay you to look this plant over. Address, LOCK BOX 277, Zanesville, Ohio.  
11 dm

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address SUPERINTENDENT, Care Clay-Worker.  
10 tf d

#### FOR SALE CHEAP.

One second-hand, double die Columbian Repress; practically as good as new.  
One Quaker Horse-power Brick Machine, in good order.  
One Ten Horse Power Portable Engine, in good order. THE HORTON MFG. CO., Painesville, O.  
1 tf 1

#### A GREAT CHANCE FOR A PRACTICAL BRICKMAKER.

A brick plant situated near Anniston, Ala., (this city now again coming to the front), and there will be a demand for bricks in 1898; for sale, or will lease to a practical brickmaker on easy terms. We have the finest clay in Alabama for common, red press and buff bricks, jugs and terra cotta, etc. Address JNO. M. ELLIOTT, Easton, Md.  
1 tf 4 pm

## G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and....

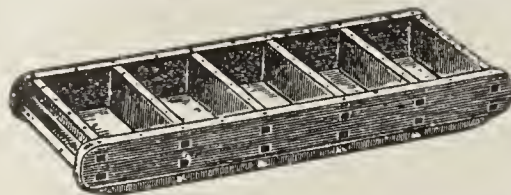
MACHINE

## MOULDS

We manufacture the the most substantial Moulds known, and guarantee every mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



# Dry Pan Clay Crushers.

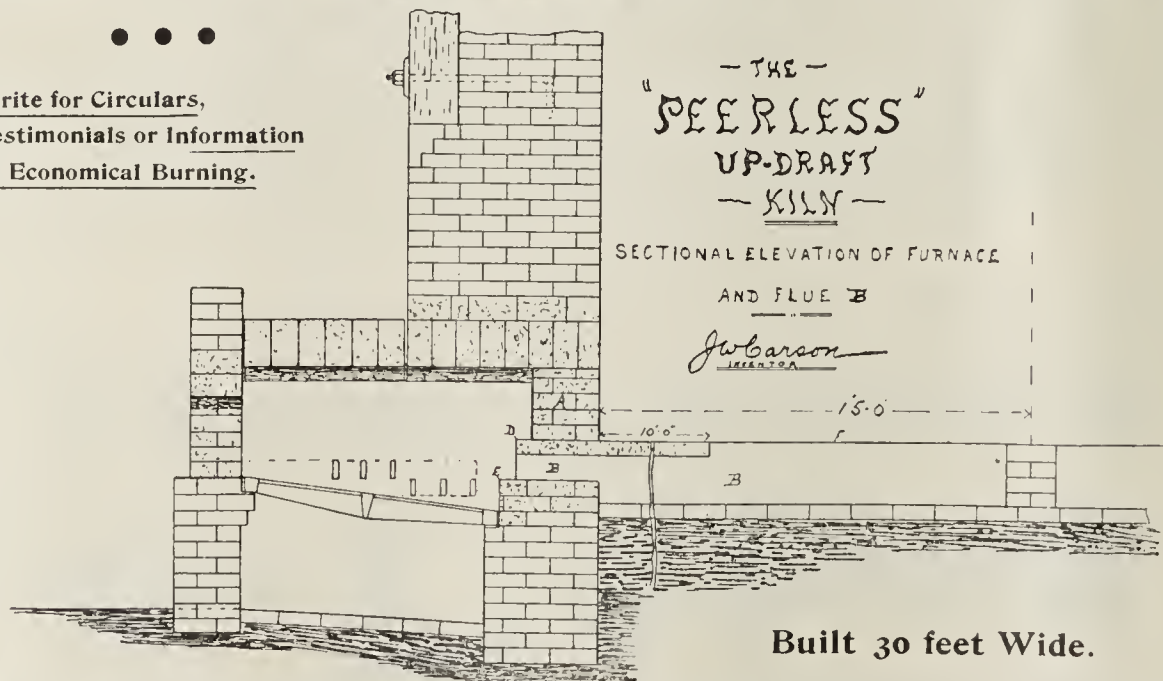
CLAY SCREENS AND ELEVATORS.

....

## Eagle Iron Works, Des Moines, Iowa.

## The "PEERLESS" UP-DRAFT ....KILN.

Write for Circulars,  
Testimonials or Information  
on Economical Burning.



Built 30 feet Wide.

J. W. CARSON, LaPrairie, P. Q., Can.



# FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

**EVENS & HOWARD,**  
920 Market Street, - - - ST. LOUIS, MO.

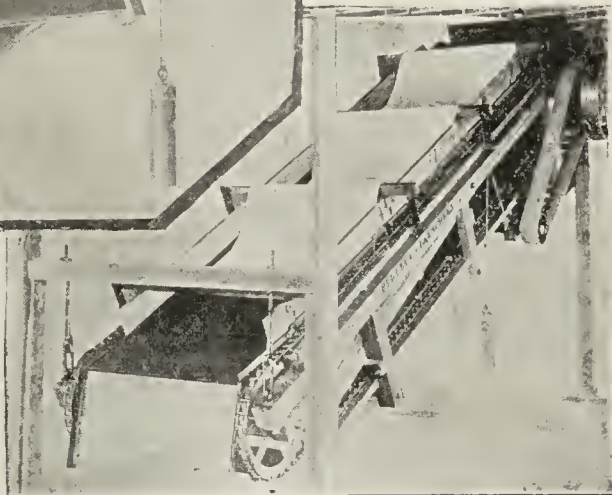
## The PERFECT CLAY SCREEN.

Always Clean.  
Perforations always open.  
Separates the clay to full size of perforation  
It is simple, durable and effective.  
Impossible to clog or paste it over.  
Especially adapted to moist clay.  
Purchaser takes no risk.  
Satisfaction guaranteed or no pay.  
... Write us for full information ...



View on underside showing action of Rotary Brush

HAS NO EQUAL.



**ELDER & DUNLAP,**  
Bloomington, Ill.

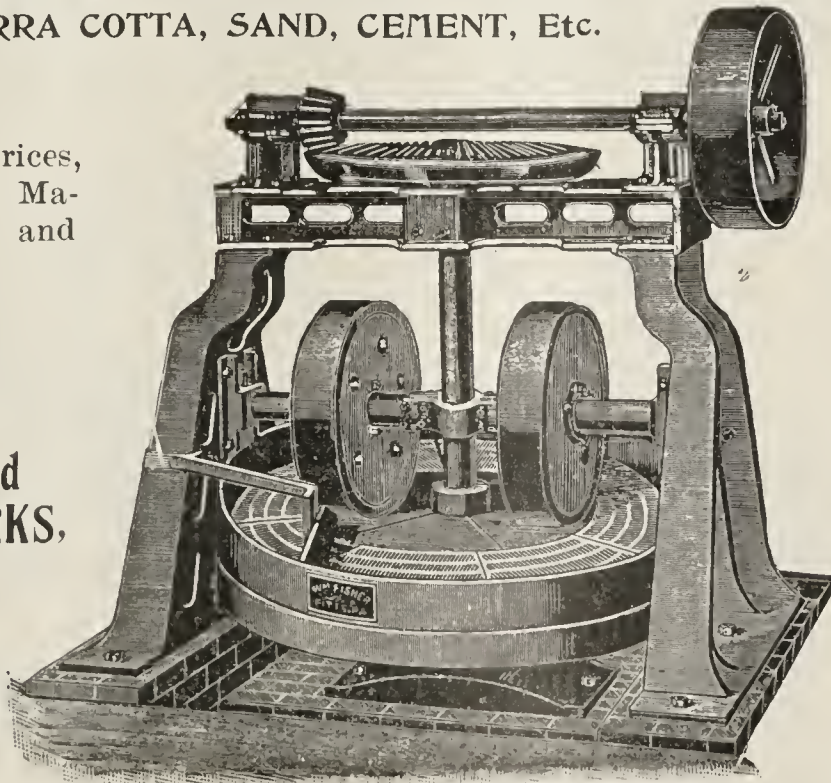
## Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

**FISHER ENGINE FOUNDRY and MACHINE WORKS,**

Phillips & McLaren,  
Proprietors,  
24th and Smallman Sts.,  
PITTSBURG, PA.

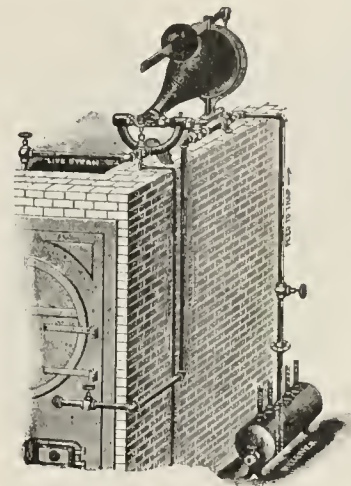


FOR SALE—Brick and tile factory; in operation now; manufactures tile in winter and brick in summer; has not shut down for 12 years, only for repairs; no competition; reasons for selling, patent kiln furnace to sell as per ad. on page 181.  
F. E. SWIFT,  
1231,  
Washington, Iowa.

### FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.  
8-foot Chisholm, Boyd & White dry pan.  
1 revolving screen and mixer, 1/2 screen and bucket elevator, with 20 6-inch buckets.  
6 spring brick trucks.  
Lot shafting, belting and pulleys.  
75-horse-power Westinghouse engine.  
1 Barr Pumping Company steam pump.  
1 Chambers Bros. Company brick machine.  
All new or little used, and in excellent condition.  
WALNUT,  
1 tf d  
Care Clay-Worker.

## Return Trap



For returning direct to Boiler the condensed Steam from the steam dryers, etc.

Positive and Automatic.  
Economical.

If you are using steam apparatus, particularly a steam dryer, I can save you good money.

For particulars write to

**A. SORGE, Jr.,**  
1021 Monadnock Block, CHICAGO, ILL.

## Manganese.

From Producer to Consumer.

For Brick, Tile, Terra Cotta and Pottery Makers.

PULP, POWDERED OR GRAIN.

Samples and Prices on Request.

**KENDALL & FLICK,**  
MINES AND WORKS IN VIRGINIA.

OFFICE:

618 Penna. Avenue N. W.,

WASHINGTON, D. C.

Booklet on the use of this material free.

**GIVEN FREE**  
to each person interested in subscribing to the Eugene Field Monument Souvenir Fund. Subscriptions as low as \$1.00 will entitle the donor to this handsome volume (cloth bound, size 8 x 11) as a souvenir certificate of subscription to the fund toward building a monument to the Beloved Poet of Childhood. But for the noble contribution of the world's greatest artists this book could not have been manufactured for less than \$7.  
Address **EUGENE FIELD MONUMENT SOUVENIR FUND,**  
412 Fort Dearborn Building, Chicago, Ill.

**A \$7.00 BOOK of EUGENE FIELD'S POEMS**  
Handsomely Illustrated by 32 of the World's Greatest Artists.

Mention this journal, as advertisement is inserted as our contribution.



**GABRIEL & SCHALL**

P. O. Box 2654.

205 Pearl Street.

NEW YORK.

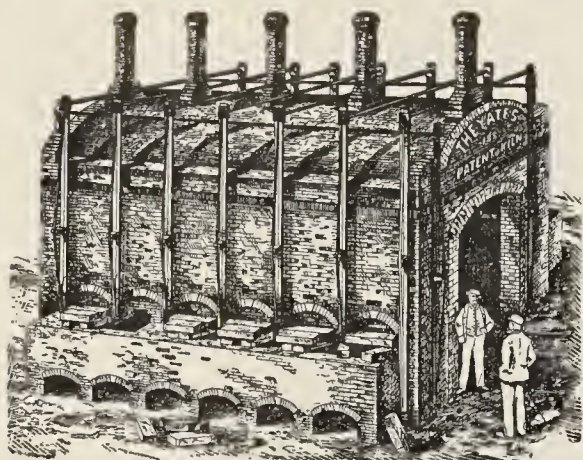
Sole Importers in the United States of the

Precipitated  Carbonate  
of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

"Seger Cones" in special import orders.

Circulars and Particulars on Application.



For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES, Johnsonburg, Penn.

**AN IMPROVED MUFFLED KILN**

For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



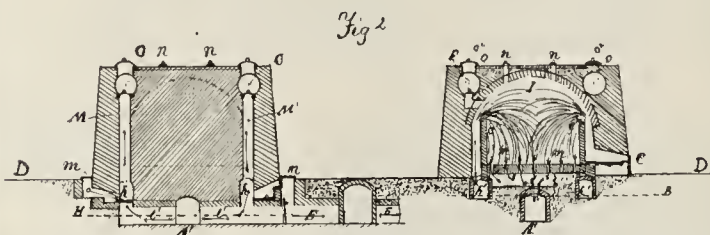
**THIS IS** the best and cheapest kiln in the long run. It is guaranteed to do its work in a perfect and even way. There is no loss in burning with this kiln. Every piece put in comes out perfectly burned, whether set in top or bottom. We have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

F. HUNDT & CO.,

801 North Winchester Ave., Chicago, Ill.

S. GEYSBEEK,  
**Ceramic Chemist,**  
New Brighton, Pa.

# The Down Draft Continuous Kiln.



NUMBER OF PATENTS ON KILN.

Nov. 20th, 1892, 486,972.

Oct. 24th, 1893, 507,274.

Dec. 5th, 1893, 510,265.

Aug. 14th, 1894, 524,442.

Sept. 25th, 1894, 526,492.

Feb. 19th, 1895, 534,509.

This kiln has been improved to meet the demand of every brickyard. It manufactures the best material that the clay will produce. The advantage of the improvement is that it combines the down draft and the Continuous kiln in one. Any one contemplating the improvement of his product and the saving of fuel should not fail to correspond with me, and get information in regard to construction and rights required.

C. F. KAUL, Madison, Neb.

# Roofing Tile is Coming....

➡ THE MACHINE TO MAKE  
IT HAS ARRIVED. . . . .

A simple and very economical way of making Clay Shingles or Roofing Tile is found by using the machinery covered by recent patents granted to A. H. Murray and C. S. Welch. This industry is completely revolutionized by reducing the cost of manufacture to a nominal sum compared with the cost under the crude and expensive methods heretofore in use. This machinery is now ready for the market, and it has been thoroughly tested and is in practical operation to an extent that places it beyond a doubt of its practicability. Only territory east of the Mississippi river open. Correspondence solicited.

For full information address

**MURRAY & WELCH, Huntington, W. Va.**

MENTION THE CLAY-WORKER,  
WHEN WRITING TO ADVERTISERS,  
MENTION THE CLAY-WORKER.



# NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

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**E. M. PIKE, Patentee**

CAPT. G. H. ETTLA, Agt. }  
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Chenoa, Ill.



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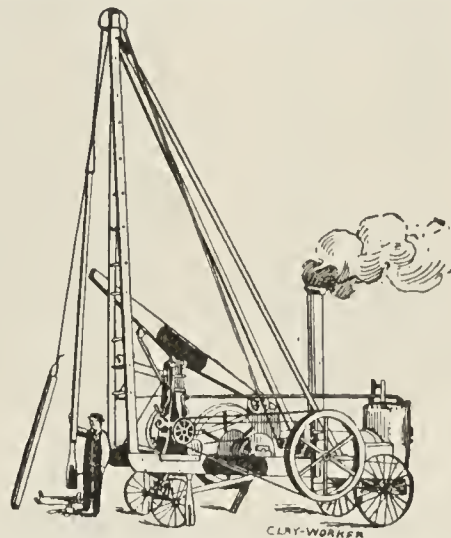
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PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

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Tanks of any size from 100 to 100,000 gallons capacity.

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and waste time

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From the first touch of the pen to paper until you finish.

## A Waterman Ideal Fountain Pen

Does it as easy as a pencil and makes a plain, neat and lasting copy. For sale all over the world. Catalogues furnished.

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Largest Fountain Pen Manufacturers  
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Approved Appliances for

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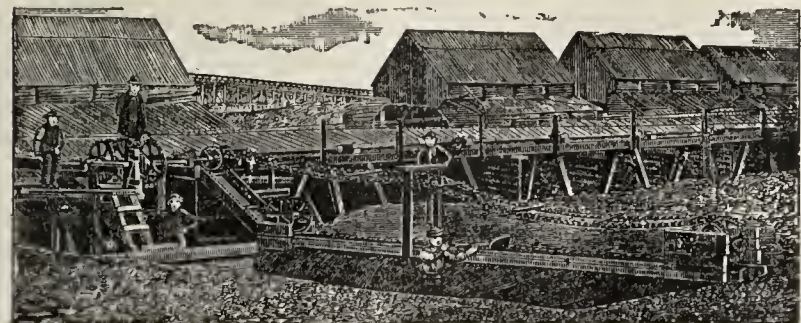
Mey Detachable Chain Belt.



Ewart Detachable Chain.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make  
Many More  
Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

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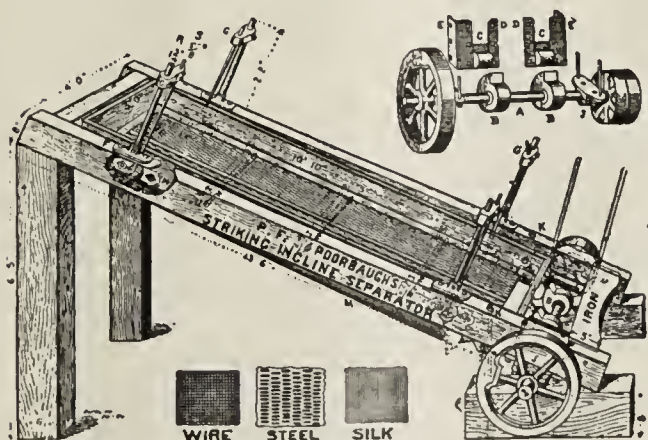
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For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

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These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

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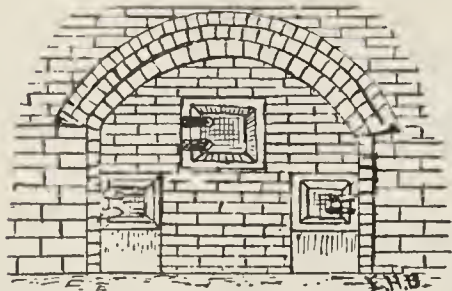
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GAS GENERATOR AND SMOKE CONSUMER.

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Fires not disturbed but once in 10 hours till water-smoke is off. Guaranteed to water-smoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to invest-

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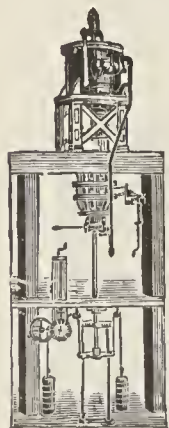
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Manufacturers of

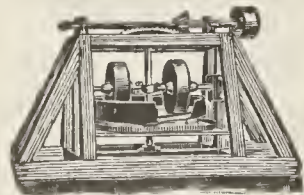
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PANS AND PUG  
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..... WITHOUT .....

# The Carmichael Clay Steamer,

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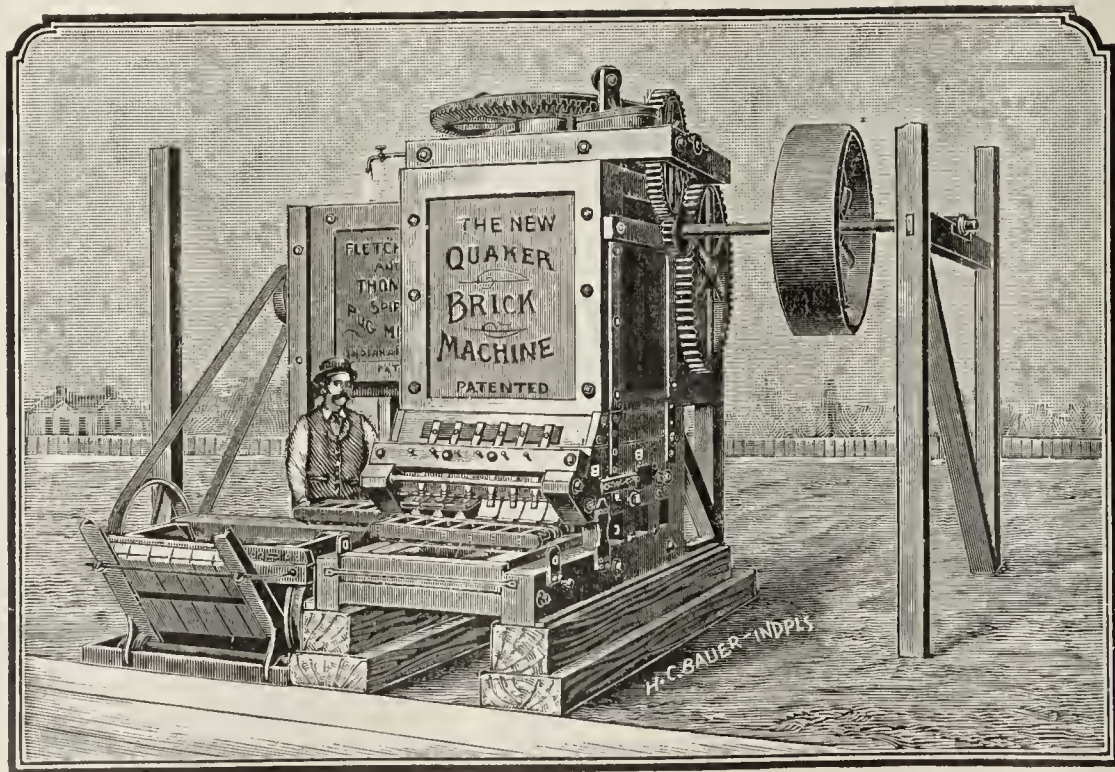
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THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Iron Quaker, Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first class brickyard supplies at a very reasonable price. It will pay you to send for catalogue and special discounts before placing your order elsewhere.



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General Agent,

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INDIANAPOLIS, IND.

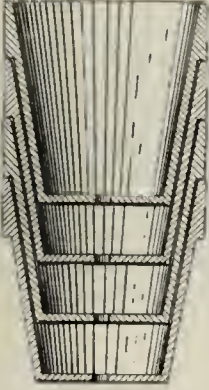


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No expert workmen required.  
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 4,000 four-inch    "    2,000 seven-inch "

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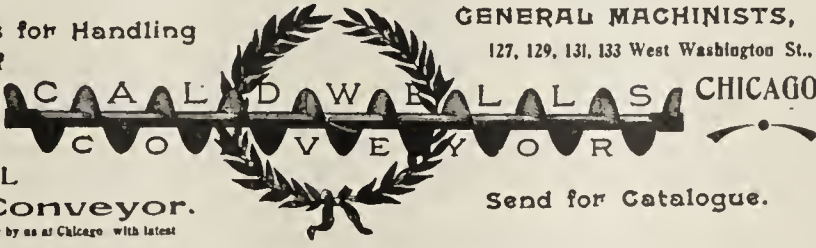
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Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

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The Short Line for

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| LEAVE<br>INDIANAPOLIS, | AR. TERRE<br>HAUTE | AR. ST.<br>LOUIS. |
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| * 7:20 am              | 10:05 am           | .....             |
| * 8:10 am              | 10:15 am           | 3:15 pm           |
| * 12:40 noon           | 2:35 pm            | 7:12 pm           |
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All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

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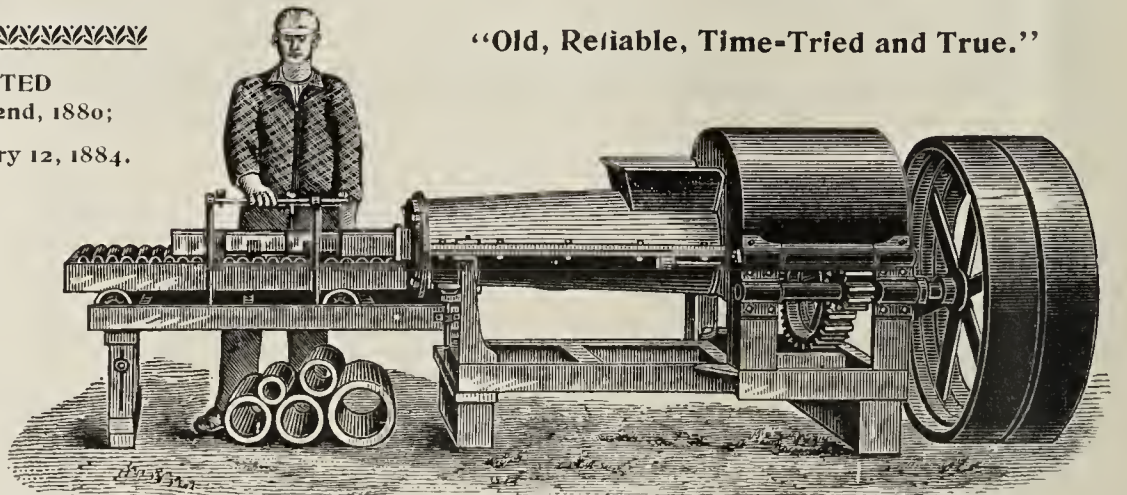
To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

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"Old, Reliable, Time-Tried and True."

### PATENTED

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and  
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

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We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

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## H. C. BAIRD & SON, PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

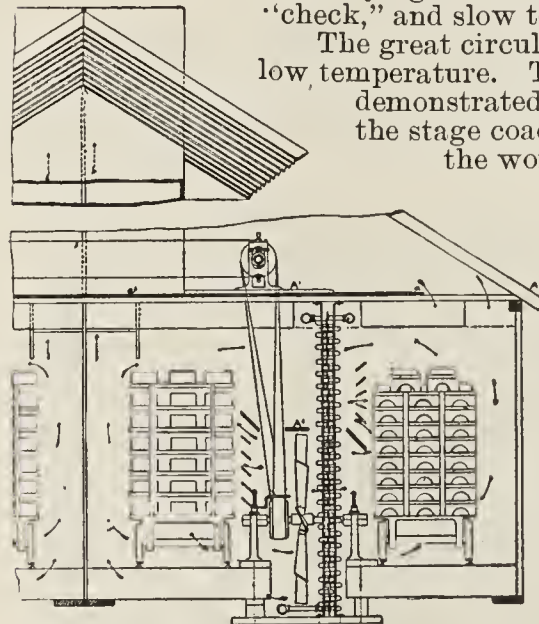
## Still Further Testimony!

### Soft Mud Brick Dried in 10 or 12 hours.

Most trying service with large brick of tough clay that is liable to "check," and slow to dry.

The great circulation of air does it, as of out of door drying, at low temperature. The correct principle, successfully adapted and demonstrated. Saves more time than the locomotive over the stage coach; with fans and machinery, inside and close to the work, that pay well and cost no trouble to run, as users attest.

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The INSIDE FAN DRYER.

U. S. Pat. Mar. 31, 1891. No. 449,170.  
U. S. Pat. Mar. 31, 1891. No. 449,231.  
British Pat. Mar. 31, 1891. No. 5,520.  
Canadian Pat. May 30, 1892. No. 39,025.  
Canadian Pat. May 30, 1892. No. 39,026.

You have the best drier in the market and I purpose in the near future to put in another two track section. Wishing you success, I am

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,

CHAMBERS BROTHERS Co.

J. H. CHAMBERS, Gen'l Mgr.

306 Hannah St., West, Hamilton, Ont. Can. }  
July 10th, 1897. }

S. G. Phillips, Esq., Rahway, N. J.

Dear Sir:—I am pleased to reply that your little 12 feet x 51 feet, two track, drier has been in use by me since May 15th, 1897 and works remarkably well.

Our clay takes from six to eight days to dry on yard pallets and three or four days in a neighboring drier, yet the six or seven thousand large soft mud brick it holds on 16 cars are easily dried in 10 or 12 hours in a superior and most economical manner because of heating with the engine exhaust steam only.

The endless belts drive the 10-60 in. diameter (inside volume) fans easily not appearing to cost over 6 or 7 h. p. at 360 turns per minute to fairly make the wind blow.

I purpose in the near future to put in another two track section.

Yours truly,  
JOHN W. FRID.

S. G. PHILLIPS.

Agent and  
Patentee,

161 Grand Street.

Rahway, N. J.

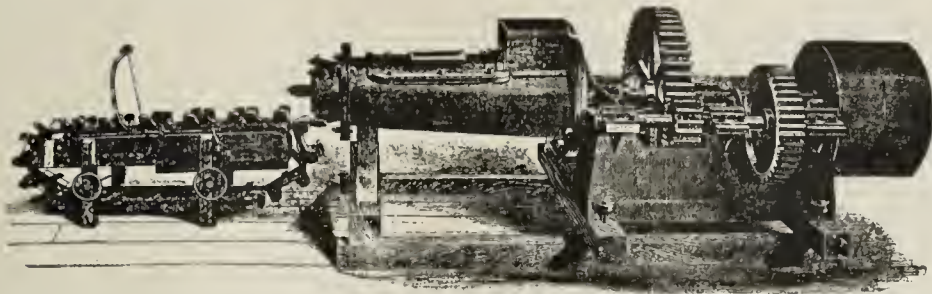


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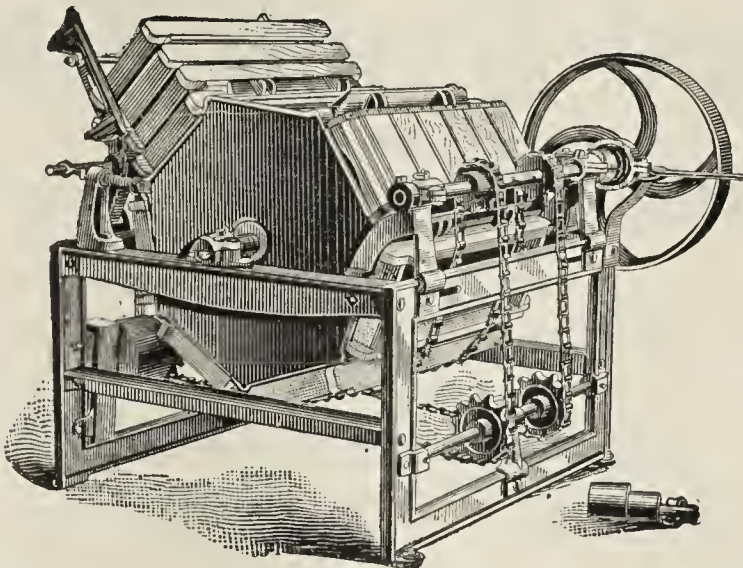
Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

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### CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

**A. H. NEWTON,**  
Manager and Sole Agent,  
HAVERSTRAW, N. Y.



THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.

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COAL,  
SAND,  
BRICK,  
TILE,  
PACKAGES.

Also Furnish  
RUBBER,  
LEATHER,  
COTTON  
BELTING.

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Roller, Steel and Special CHAINS  
—FOR—  
**ELEVATING  
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MACHINERY**  
FOR HANDLING MATERIAL OF ALL KINDS.

Power Transmission Machinery.  
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WIRE CABLE  
CONVEYORS.  
For long and  
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**Bricks, Tiling, Pottery?**  
WE know ALL about  
**SPLENDID LOCATIONS**

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Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road.

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**Sandusky and Peoria**  
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TAKE THE  
**BIG 4**  
TO  
**ST. LOUIS**



# The "New South" Brick Machinery

Built for Business.

Has won over a number of others, in actual service, in the past. We expect to make it continue to win in the future.

• • •

GREENVILLE, S. C., Sept. 23rd, 1897.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Since putting in your "Xtra" machine with automatic cutter I have the brick business of this city all to myself. I made 112 in one minute this morning, and can make 50 M any day of 11 hours. The bricks are dandies.

Yours very truly,

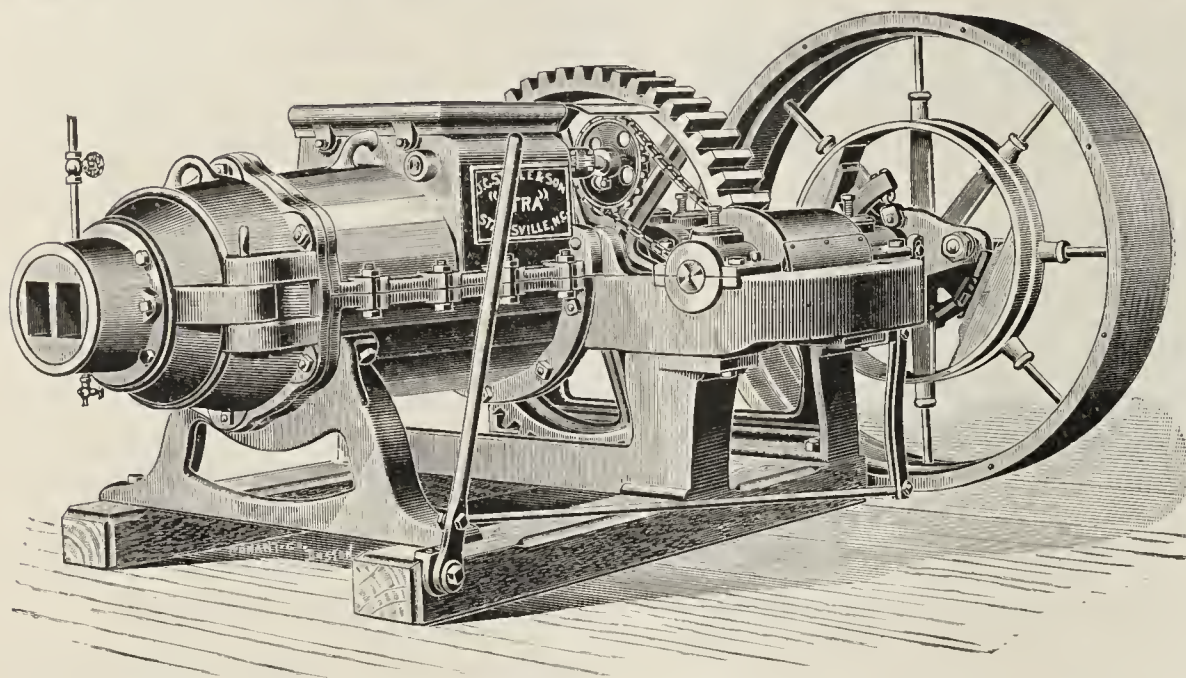
THOS. J. HANNON.

Mr. Hannon took out another machine that was almost new, and put in our "Xtra." We do not claim 50 M per day for this machine, but this is what our customers say that it will do.

• • •

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.



X-tra Machine. Capacity 25,000.

## The Standard Brick Machines,

MANUFACTURED BY

**A. M. & W. H. WILES CO.,**

*Grassy Point, Rockland Co., N. Y.*

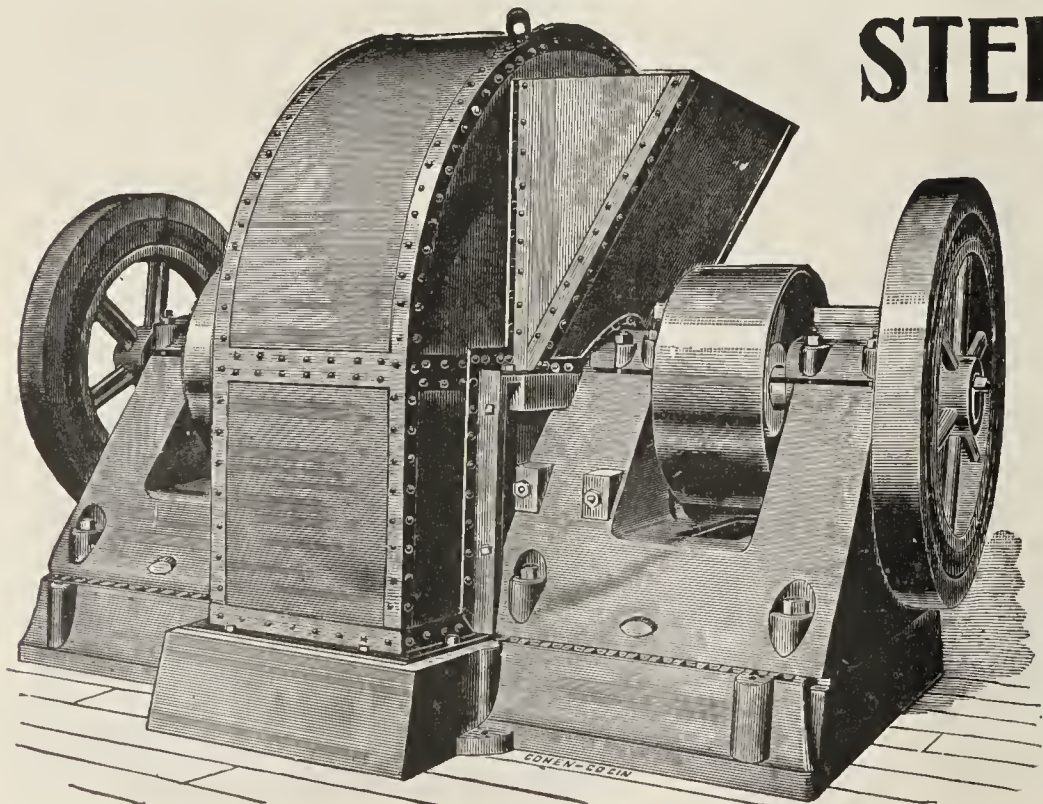
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



## STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly  
Pulverizing Clay in a  
Dry, Semi-Dry or  
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

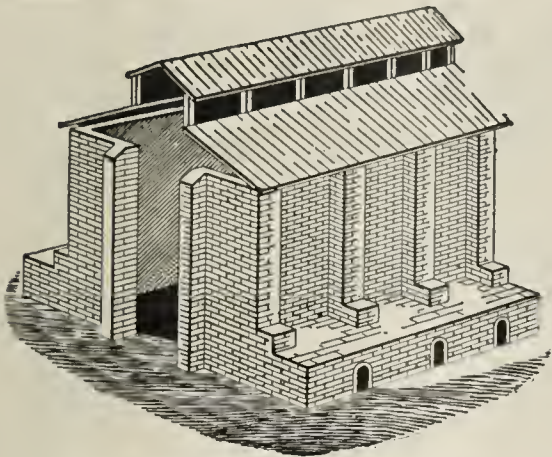
Write for catalogue, giving full description, references and testimonials. Address,

**Stedman's Foundry & Machine Works,**

**Aurora, Ind.**



Mention the CLAY-WORKER  
WHEN WRITING TO ADVERTISERS,  
Mention the CLAY-WORKER.



Up-Draft Kiln.

## LOUIS H. REPELL'S IMPROVED-KILNS

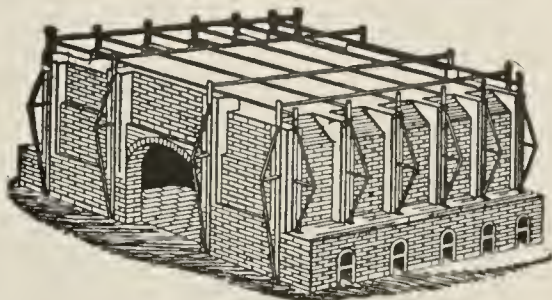
For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

# The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

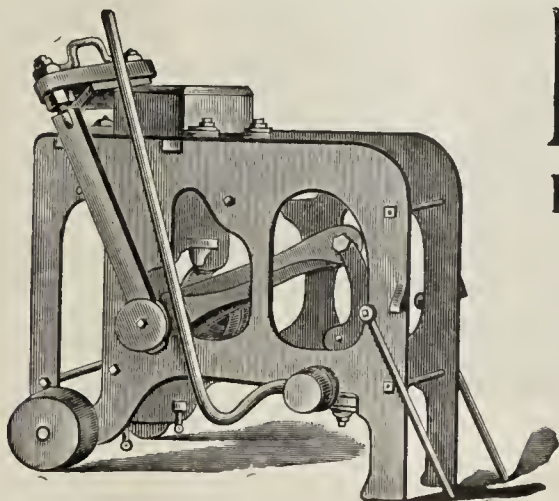
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

Days Brick Works.

BELLEVILLE, ILL.



RED BRICK PRESS.

**GEORGE CARNELL,**

Nos. 1,819, 1,821 and 1,823 Germantown  
Avenue and Fifth Street,

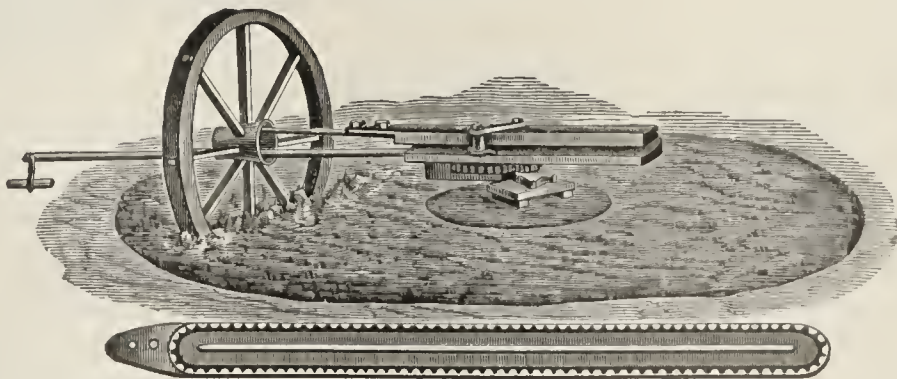
PHILADELPHIA, - - - PENN.

## PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.



# Morrison's Latest

## Improved Kiln,

### FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

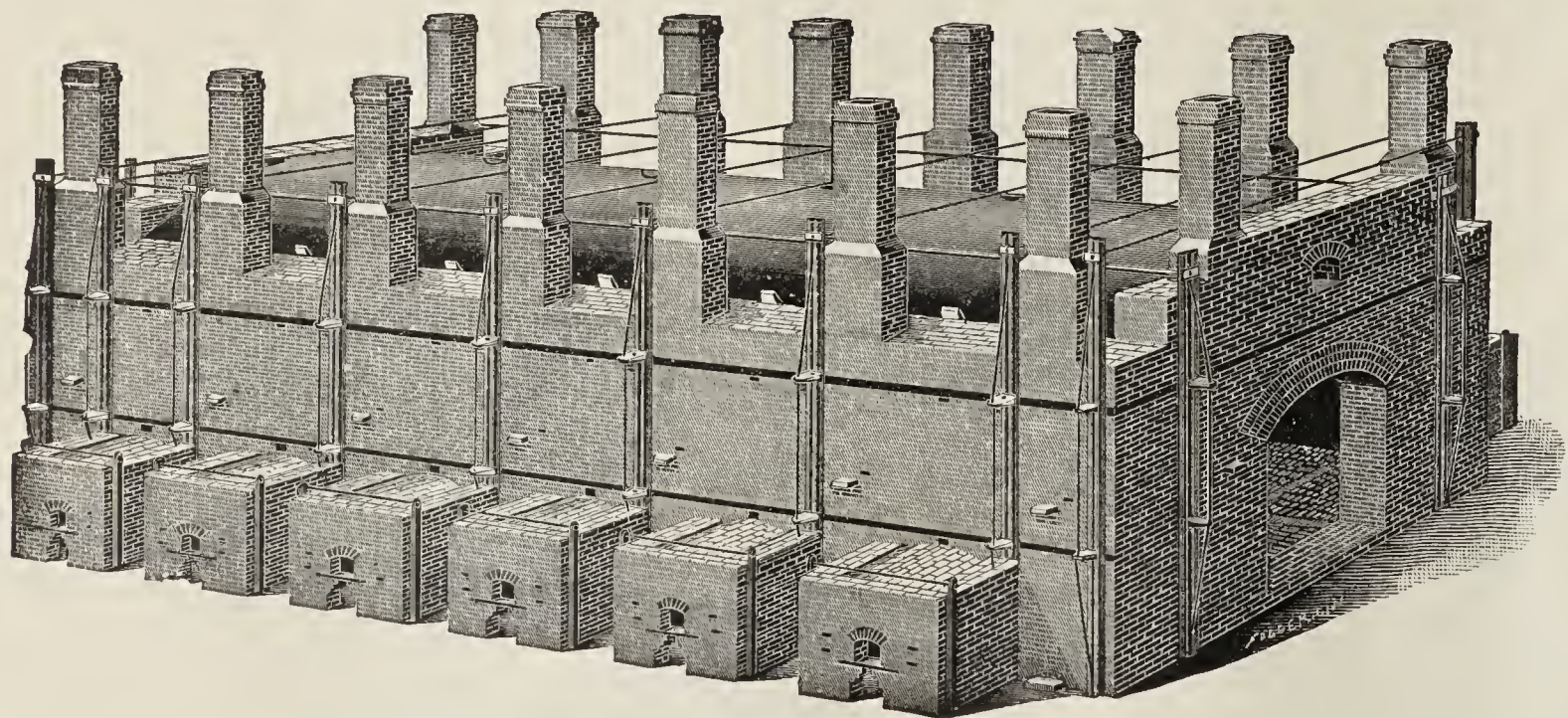
**R. B. MORRISON & CO.,**

*P. O. Box 335.*

*ROME, GA., U. S. A.*

## The EUDALY

IMPROVED —  
DOWN-DRAFT KILN  
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

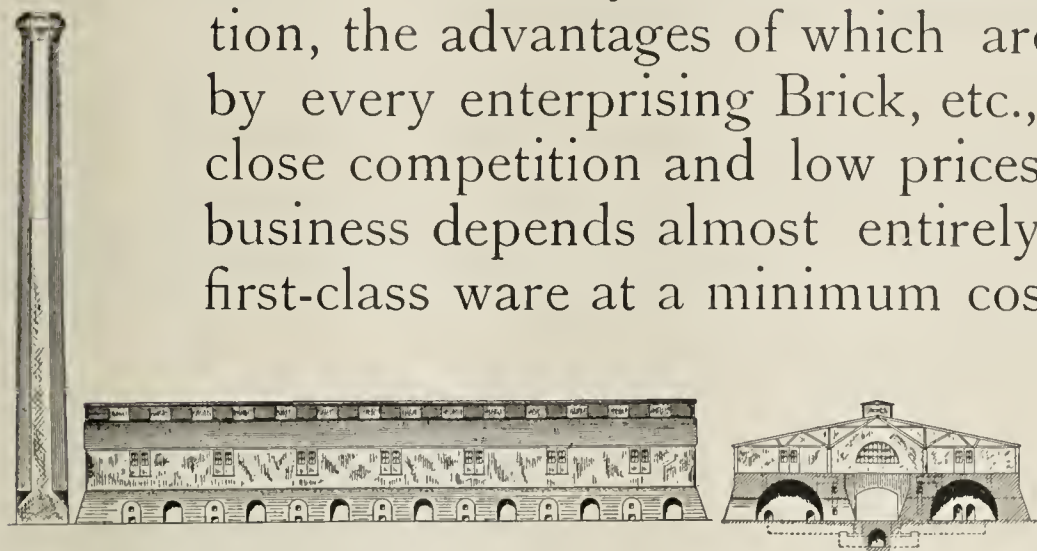
The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

**W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.**



# HAIGH'S NEW SYSTEM OF KILN.

I want you to realize that this Continuous System of burning secures both the efficiency of the side firing down-draft or up-draft kilns, and the economy of the Continuous Kilns forming a combination, the advantages of which are well worthy of consideration by every enterprising Brick, etc., manufacturer. In these days of close competition and low prices, success in the brick making business depends almost entirely upon the ability to produce first-class ware at a minimum cost, and any improvement which



offers, as does this system of burning, a saving of 60 to 75 per cent. in the cost of burning of the product is by no

means an insignificant or unimportant one. Some of our largest Brick manufacturers are using them with the utmost success. Further particulars of which can be had from

**H. HAIGH, Catskill, N. Y.**

## The Lehmann <sup>Portable</sup> <sub>Continuous</sub> Kiln,

### And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

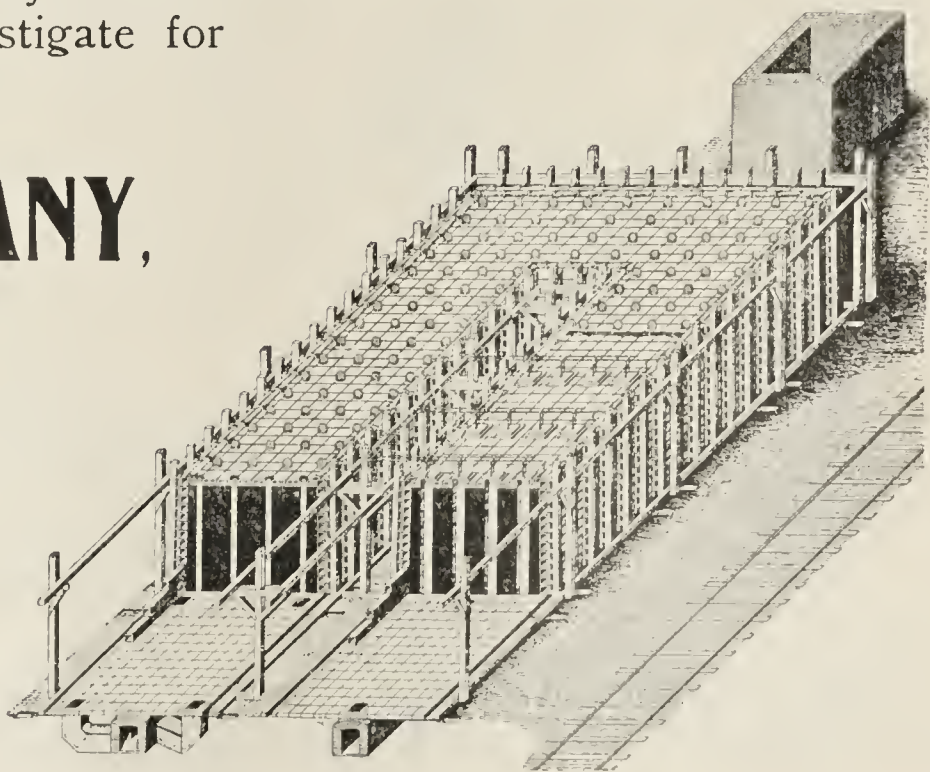
**F. LEHMANN & COMPANY,**

Foot of West Wellington Street,

**CHICAGO, ILL.**

Kiln Builders, Consulting Clayworker Engineers,  
Plans and estimates furnished for Brick, Lime and  
Cement Works. Practical tests made.

**THE LEHMANN CONTINUOUS KILN** has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.

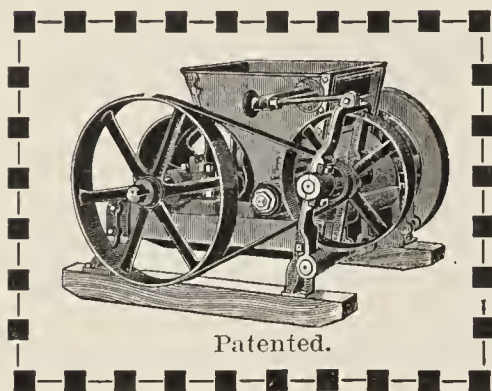




# The Potts Disintegrators

Simple in Construction, Strong and Durable.

Work any clay direct from bank. They will not choke or clog. They grind the small stone and separate the large ones.



Milledgeville, Ga., November 4, 1897.

C. & A. POTTS & CO., Indianapolis, Ind.

Gentlemen:—For ten year I used one of your old style Disintegrators, it did good work early this year I had it changed to the way you now make them and it is simply perfect. My son uses one of your Disintegrators and without it he could not make first-class brick out of the clay he has to use. Every brickmaker who has hard clay to work should put in one of your Disintegrators, it does all you claim for it.

Wishing you much success I am

Yours truly,

J. W. McMILLAN.

We manufacture 12 sizes of Disintegrators and can furnish any size promptly. We guarantee them to do as claimed or no sale.

Write for prices and terms.

**C. & A. POTTS & CO., Indianapolis, Ind.**

# The Potts Mould Sander.

Simple in Construction, Strong and Durable. Never breaks or Causes Delays.

• • •

**THE BROCKWAY BRICK COMPANY,**

Manufacturers of Superior Quality Building Brick.

Fishkill-on-Hudson, N. Y., October 23, 1897.

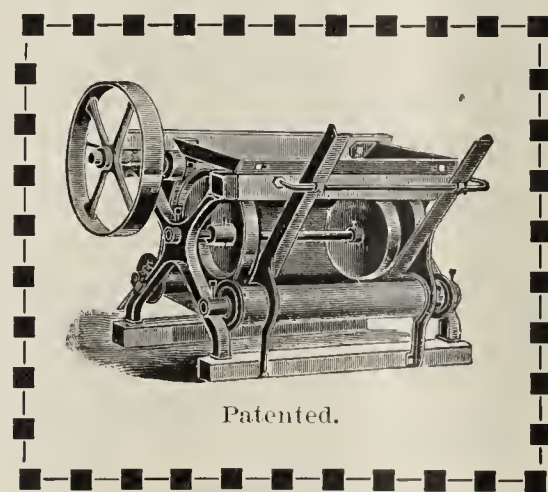
Messrs. C. & A. Potts & Co., Indianapolis, Ind.

Dear Sirs—We have used four of your Mould Sanding Machines the past season, and they have given us entire satisfaction, neither one of the four having lost any time from breakdowns, or delays of any kind.

Yours respectfully,

BROCKWAY BRICK COMPANY.

• • •



This is a great money maker. A boy does the work better than can be done by hand; no sand wasted; is easily adjusted to suit any size mould.

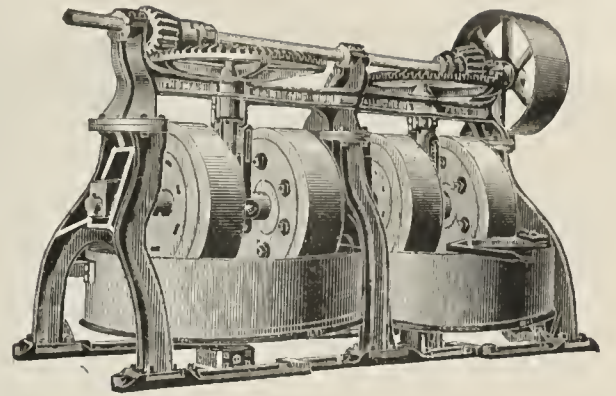
We also make a specialty of Brick Moulds for machine or hand, made of all cherry, bound with extra heavy steel. You will find our prices right.

**C. & A. POTTS & CO., 814 to 824 W. Wash. St., INDIANAPOLIS, IND.**

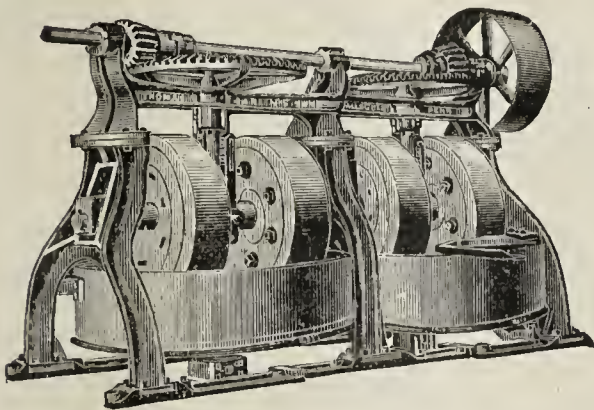


# CARLIN'S DRY PANS are

The Best and the Cheapest Dry Pans on the market. They are the **Cheapest** because they are the **Best**. Carlin's Dry Pans are built for service and capacity. Ask those who are using Carlin's Dry Pans and they will tell you they are the **best and cheapest** pans made. We make several different sizes. If you are going to buy a Dry Pan and want the best value for your money don't fail to get our prices and terms.



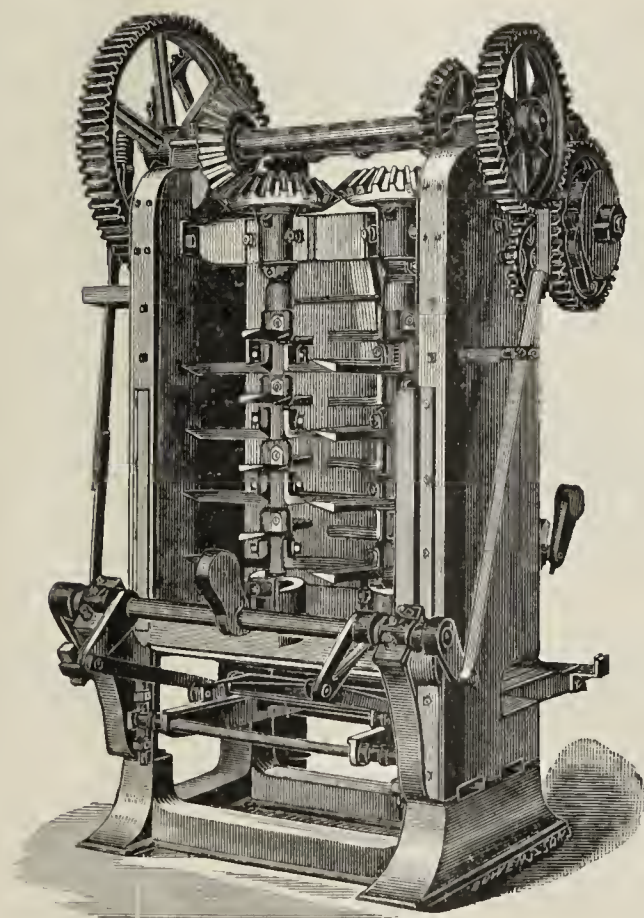
We also sell **Engine Boilers, Pallet Cars, Revolving Cranes, Conveyors, Hoisting Machinery, etc.**



**Thomas Carlin's Sons,**  
ALLEGHENY, PA.

# THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



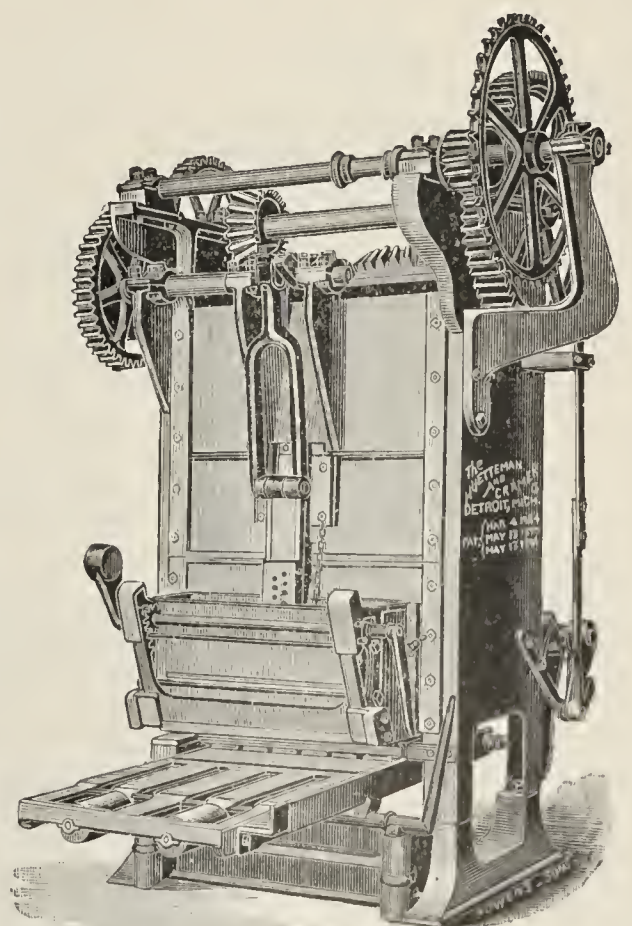
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE  
AND PRICES TO

**The Huetteman  
& Cramer Co.,**

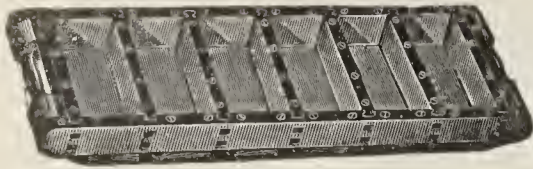
Manufacturers of the Duplex Brick Machine and general outfit for  
brickyards,

12, 14 & 16 Sherman St.,  
DETROIT, - - MICH.

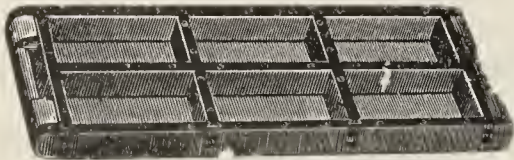




# Do YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see!"

We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

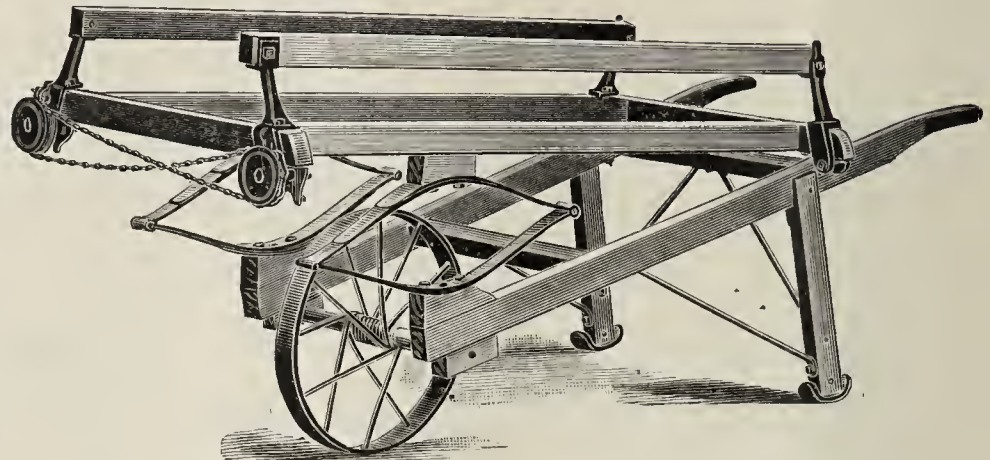
future delivery desired now. We make the best

➔ Moulds, Trucks and Barrows,

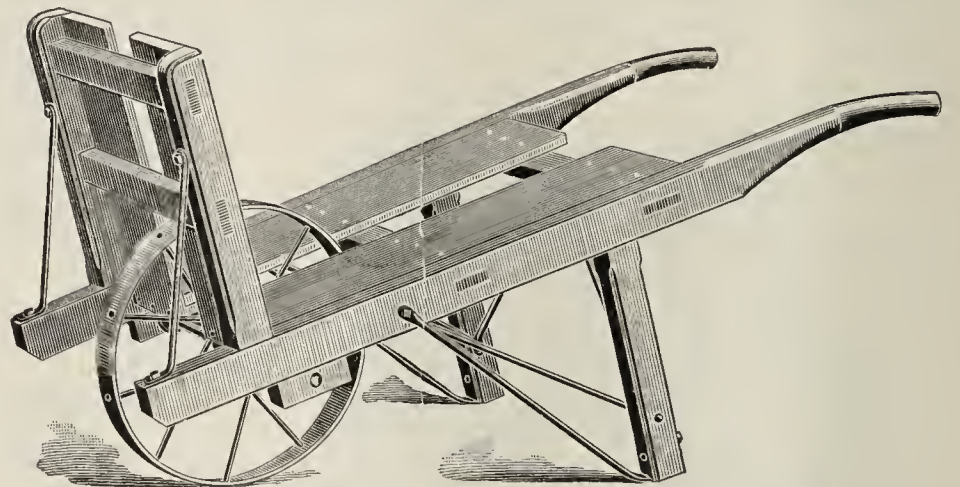
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



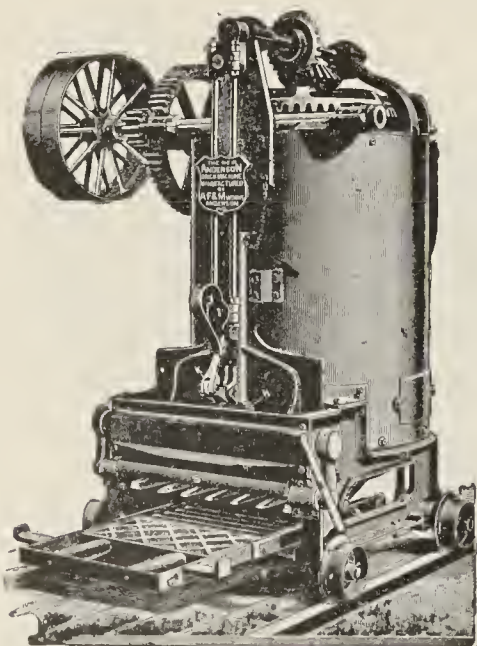
No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00  
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

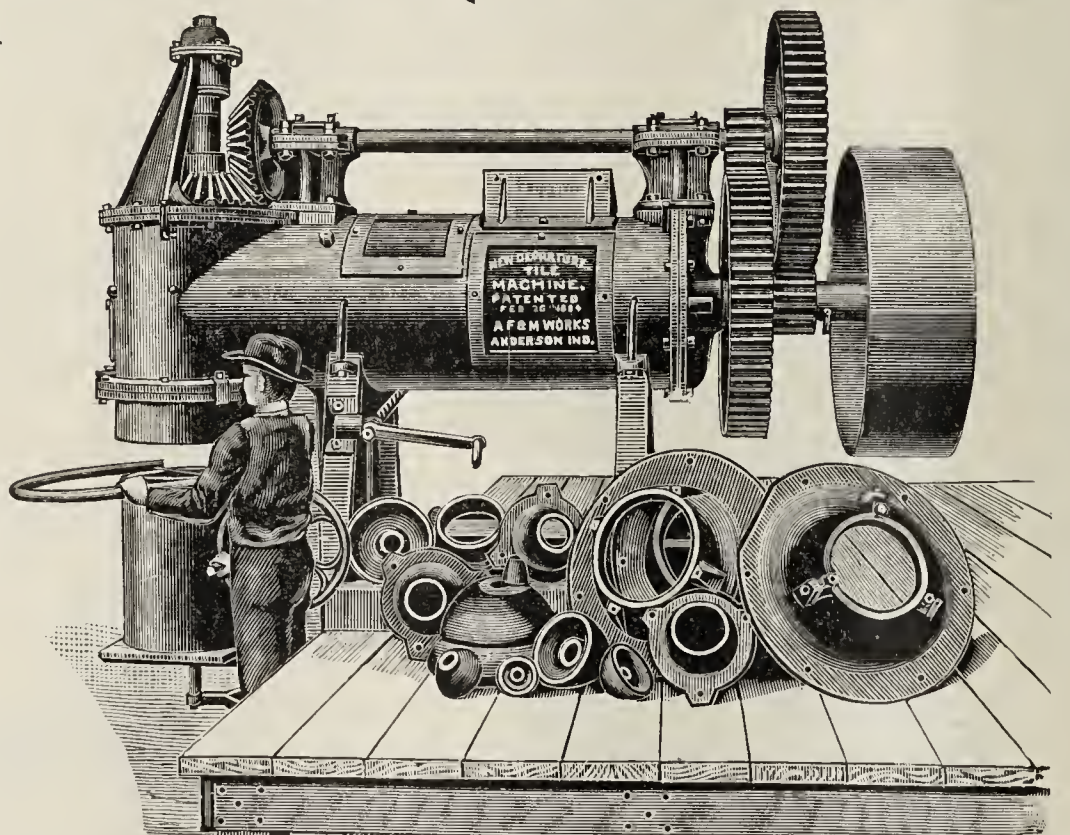
## New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.  
Steam Power.

Write  
for  
Catalogue  
and  
Prices.



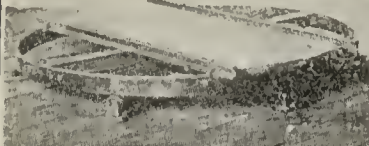
NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana





No. 146. TURNABLE.



No. 150. STEEL BOTTOM DUMP.



No. 170. STEEL SIDE DUMP.



No. 201. OAK SIDE DUMP.

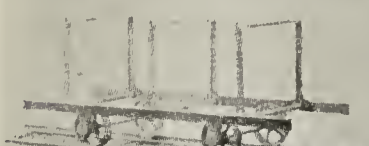
**THE ATLAS BOLT & SCREW CO.,**  
**CLEVELAND, O., U.S.A.**  
 MANUFACTURERS OF  
**STEEL BRICK DRYER CARS,**  
 SMALL CARS OF ALL KINDS,  
**STEEL DRY KILN, LUMBER TRUCKS,**  
 STRONG, LIGHT AND EASY RUNNING.  
**FULL LINE STEEL WHEELBARROWS.**



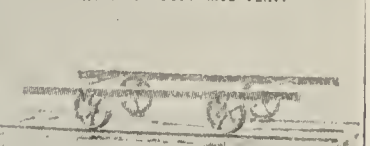
No. 142. TRANSFER CAR.



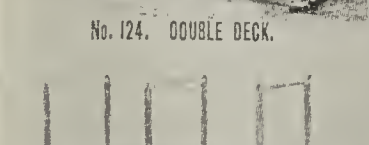
No. 105. SOFT MUD FLAT.



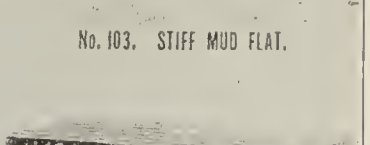
No. 124. DOUBLE DECK.



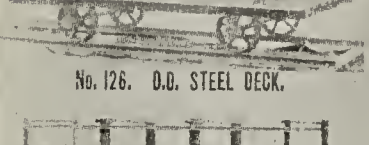
No. 103. STIFF MUD FLAT.



No. 126. D.D. STEEL DECK.



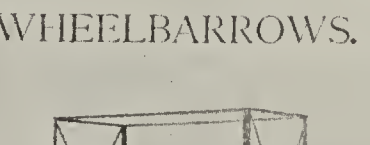
No. 108. FLAT, STEEL DECK.



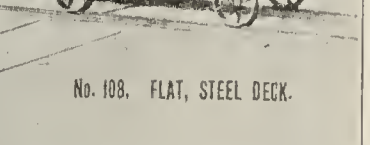
No. 136. 3 SECTION RACK.



No. 133. SOFT MUD RACK.

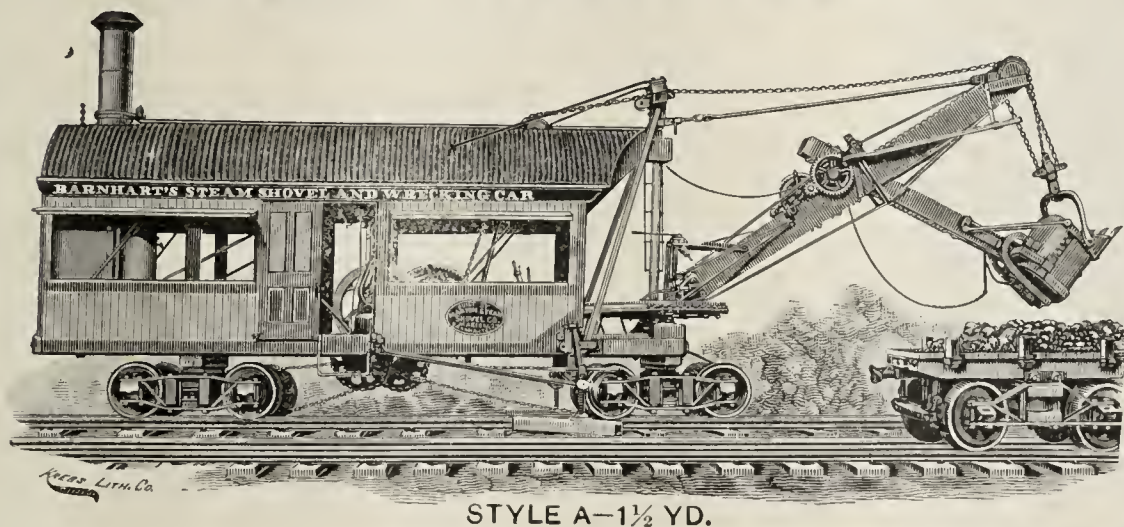


No. 140. BOX SHOGGS. Etc.



No. 139. SHINGLES, STAVES. Etc.

# Steam Shovels for Brickyards.



OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

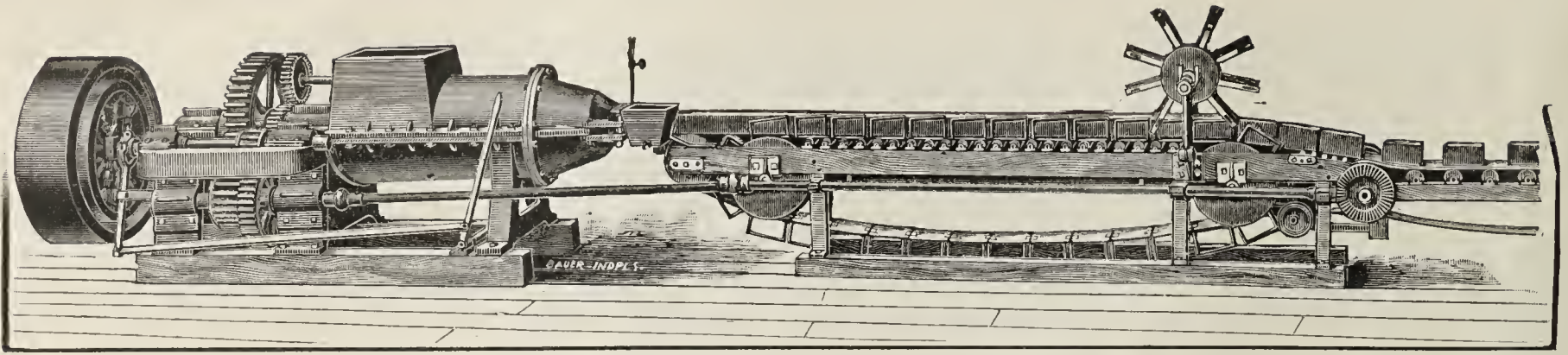
**The Marion Steam Shovel Co.,**

603 West Center Street, - **MARION, OHIO.**



STYLE C-¾ YD.





Office of **MATTES BRICK COMPANY,**  
**Building and Paving Brick.**

Decatur, Ill., January 22nd, 1898.

LEADER M'FG. CO., Decatur, Ill.

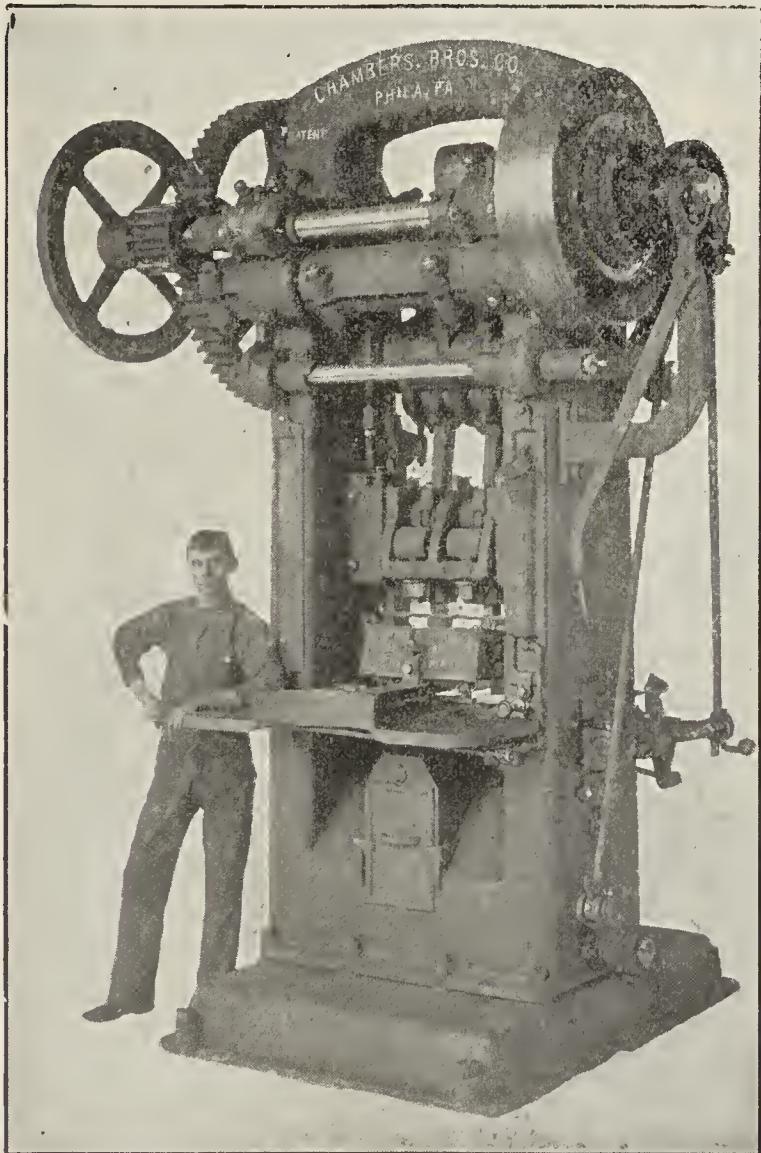
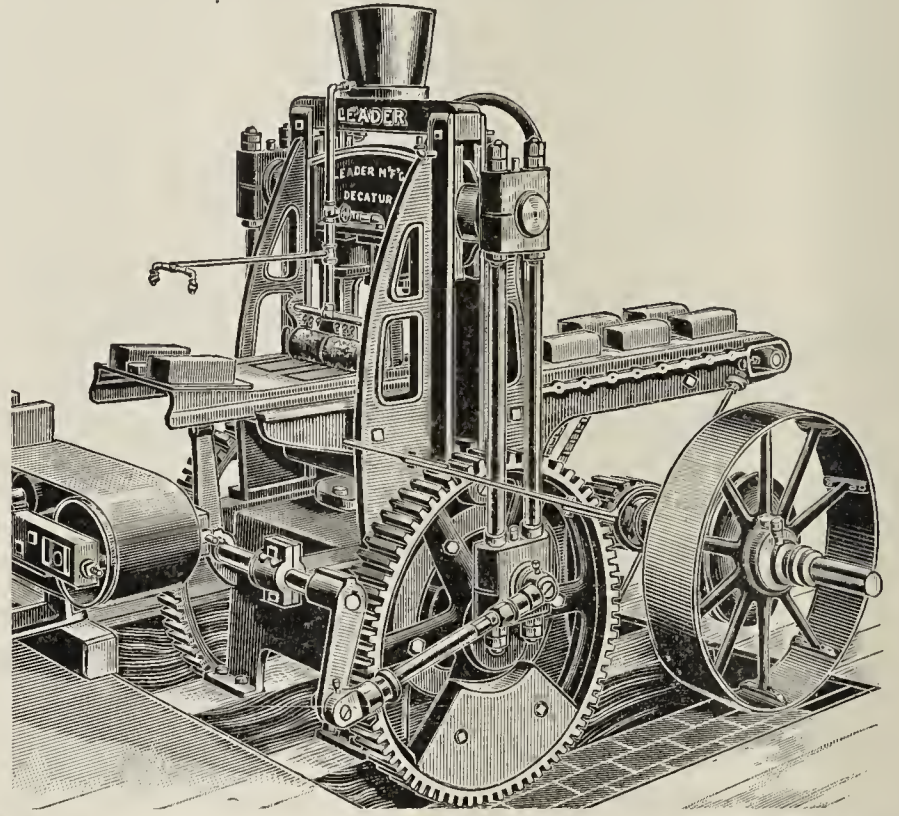
Gentlemen:—After having repressed about one million brick on the two LEADER REPRESSES you furnished us last Summer, we are pleased to bear testimony that they are beyond a doubt the most perfect working press we have ever seen. They are simple and strong in construction, run easy and perfect in every test, and no time is ever lost by them.

Hoping you may have the success you merit with this new machine, we remain,

Respectfully yours,  
**MATTES BRICK COMPANY.**

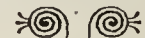
We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

**Leader Manufacturing Co.,**  
 ~~~~~**Decatur, Ill.**



The **Chambers Power Repress**
 ...For Plastic Brick...

A STRONG, stiff, machine, with all the pressing machinery above the mould-box and away from the dirt. Steel-faced cams and hardened steel cam-rollers. Main shaft bearings made with long sleeves. Cross-head guides fitted with adjustable bronze gibs. The finished brick is delivered upon a plate, and is never touched by the incoming clot, which is placed in exact position and cannot be shaved. During the initial pressure any surplus clay in the clot is expelled, and all brick thus gauged to uniform thickness, following which all openings are closed and the finishing pressure applied in a practically tight box. The product is repressed, tempered clay brick, free from blemish arising from method of delivery, and of practically uniform density and thickness. The pressure applied to each brick can be regulated at will. **Weight about 14,000 pounds.**

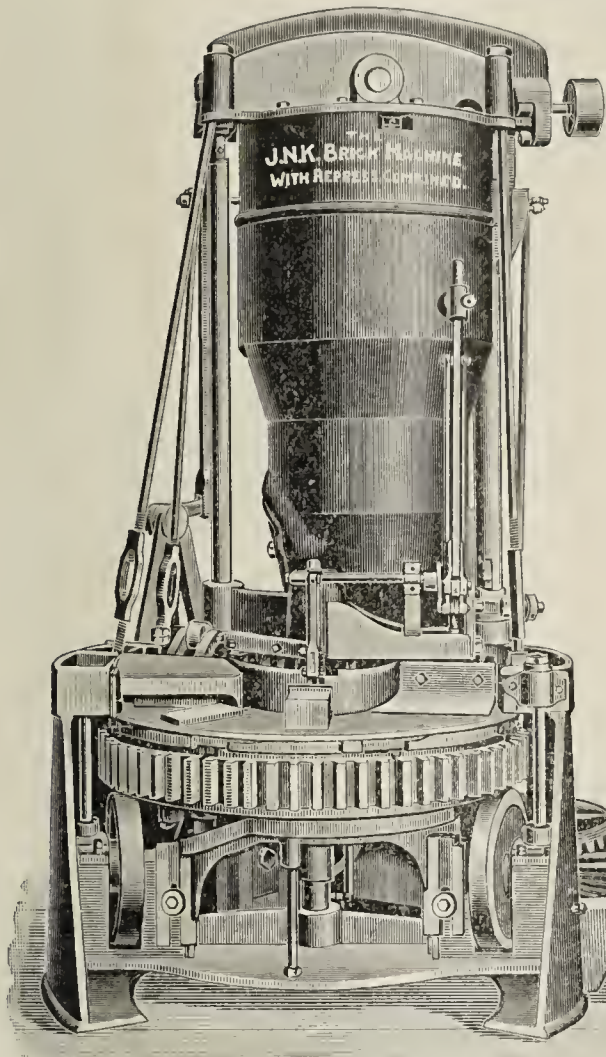


Manufactured by **Chambers Bros.' Co.**
 Fifty-Second St. **Philadelphia, Pa.**
 Below
 Lancaster Avenue. **U. S. A.**

A GREAT IMPROVEMENT IN STIFF MUD
BRICK MACHINES.....

The J. N. K. Brick Machine

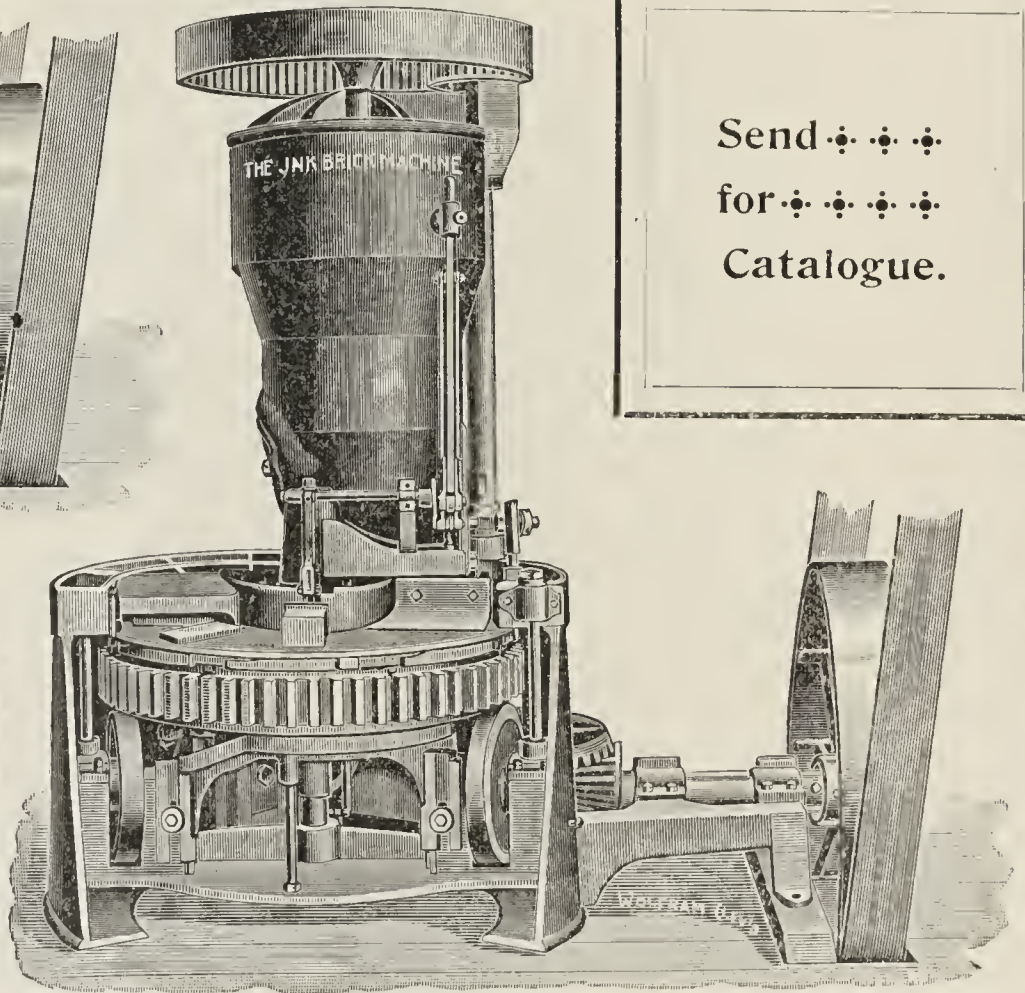
With Repress Combined.



The J. N. K. BRICK MACHINE with
Repress Combined.

THIS MACHINE has eight molds in the mold wheel, and the wheel revolves and brings the mold under the clay cylinder, where the molds are filled, then pressed to an even thickness, then comes the repress and represses them, next the brick is pushed out of the molds and onto a belt, then the mold is wiped and oiled and passes on under the clay cylinder again; now you have followed one mold around, and have made eight brick, now you can see as one brick is being made, one is pressed and one is repressed, one pushed out and one pushed off, and one mold wiped and oiled, and the repress is wiped and oiled every time it makes a brick, by these combined movements there is no time lost as 45 brick are made in one minute, and repressed and pushed off, and the molds wiped and oiled in the same minute, as all these movements act at the same time. With this machine fine re-pressed brick can be made as cheap as common brick.

Send . . .
for . . .
Catalogue.



The J. N. K. BRICK MACHINE without Repress.

The J. N. K. Brick Machine

Without the Repress will make 60 brick per minute, square, even in thickness, smooth top and bottom, sharp corners and edges, parallel in thickness, a good nice-looking brick, the mold is wiped out and oiled, and the brick are made the same as the brick on the repress machine, and the movements are the same, except the repress taken out, and it can readily be seen what I mean by a great improvement in stiff mud brick machines. As I manufactured the P. L. Sword Machine for about 10 years and having heard of all complaints, and objections to it I started out four years ago, when I bought them out, and began to remove all these though it has taken me four years of hard work and thousands of dollars to accomplish it, the results are the J. N. K. Brick Machine has none of these objections, which were made against the P. L. Sword machine; namely, the press plate and cut-off knives are not used on the J. N. K., as the brick are finished under the cylinder. The molds, when first filled, are filled one half-inch fuller than you want the brick; this surplus half-inch of clay is pressed back, under a heavy pressure into the cylinder, and the pressure is kept on till the brick is finished, so there cannot be any shifting of the clay to one side. The J. N. K. has a thorough system of wiping and oiling the molds. I will further say to those that are using the Sword Machine and are in need of a new mold wheel, or any other repairs, I respectfully request a continuance or the liberal consideration, which was at all times shown to me, by those who purchased from me. Any one wishing further information on the J. N. K. Brick Machine or desiring a P. L. Sword Machine or any part thereof, address

Central Machine Works,

JOHN N. KAUFHOLZ, Proprietor,

OFFICE AND WORKS:

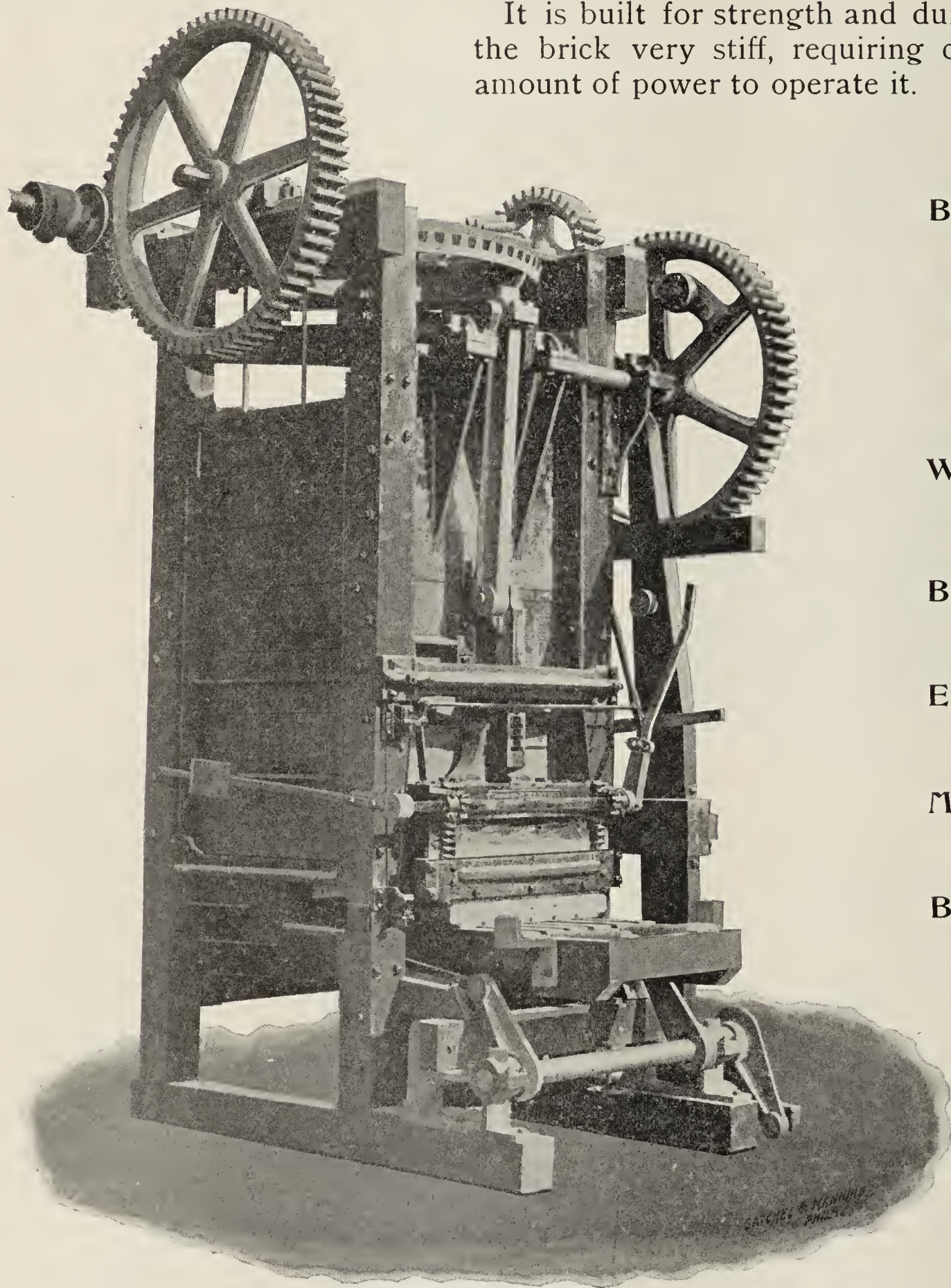
226-236 Abbey Street.

CLEVELAND, OHIO.

The Favorite Stock Brick Machine.

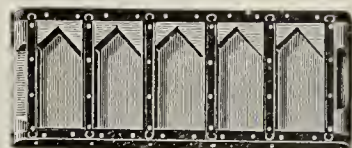
Weight 10,500 Pounds.

It is built for strength and durability, and to mould the brick very stiff, requiring comparatively a small amount of power to operate it.



• • •

BRICK MOULDS



....a Specialty.

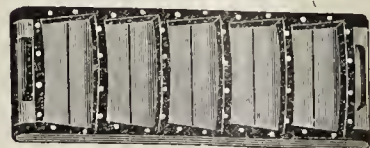
• • •

We furnish everything
a Brickmaker needs.

• • •

Brick Machines,
Pug Mills,
Clay Crushers,
Elevators,
Sand Grinders,
Mould Sanders, etc.
Machine Moulds,
Hands Moulds,
Wheel Barrows,
Brick Trucks,
Sand Dryers,
Dump Cars,
Dryer Cars,
Kiln Castings, etc.

• • •



ALL SIZES. ALL SHAPES.

Send for our 1898 Catalogue and mention anything you need.

The Henry Martin Brick Machine Mfg. Co.,

OFFICE AND WORKS: 552 No. Charlotte St.

LANCASTER, PENN.

Postal Telegraph-Cable Co. Direct wires to Factory Office.

A Dry Subject...

But an important one to every Brick and Tile Manufacturer, is the "Dryer" question. It's the same with a dryer as it is with most anything else—a watch for instance—there's dozens of kinds, but you must take your choice. Who'd take a dollar watch if he wanted a good one? It might go for a while and do temporarily, but in the long run you'd find you had made a mistake.

Now, about the Dryer: We build them and sell them, but we don't stop at that; we see that they give satisfaction. Our Dryers will remove more moisture, in less time and with less fuel than any other dryer built. Why? Because they are scientifically constructed to use the steam to the greatest extent. Not an atom of steam or fuel goes to waste.

If you're interested, write us. We will send you our Special Dryer Catalogue for the asking, and will cheerfully answer all questions and refer you to people who are satisfied users of our Dryers. There are none who are not satisfied.

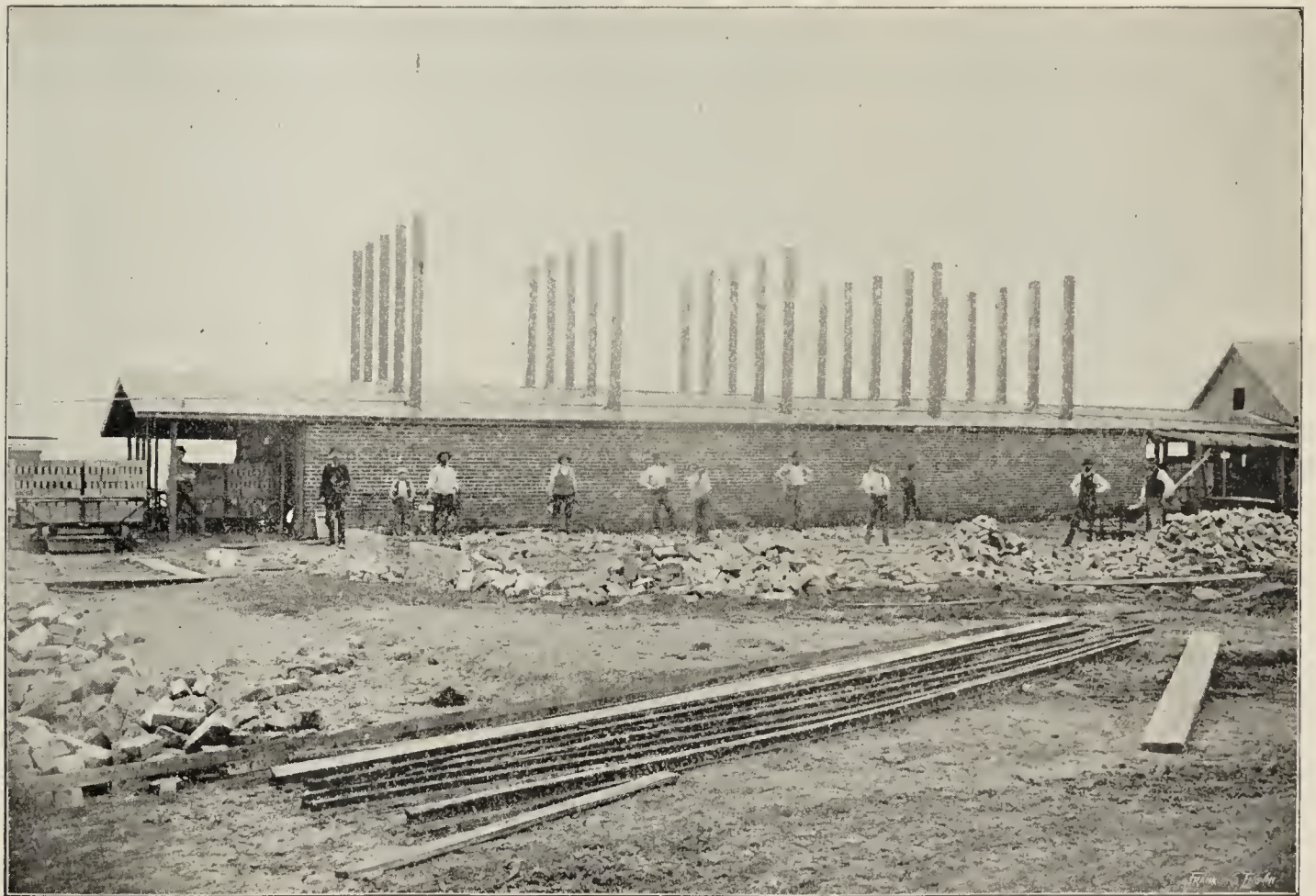
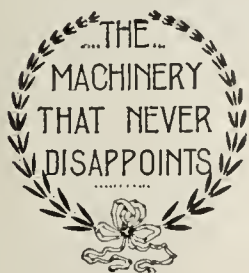
We Build

"The Dryer
that
DRIES,"

AND

A complete line
of Clay Working
Machinery.

SEND FOR COM-
PLETE CATALOGUE.

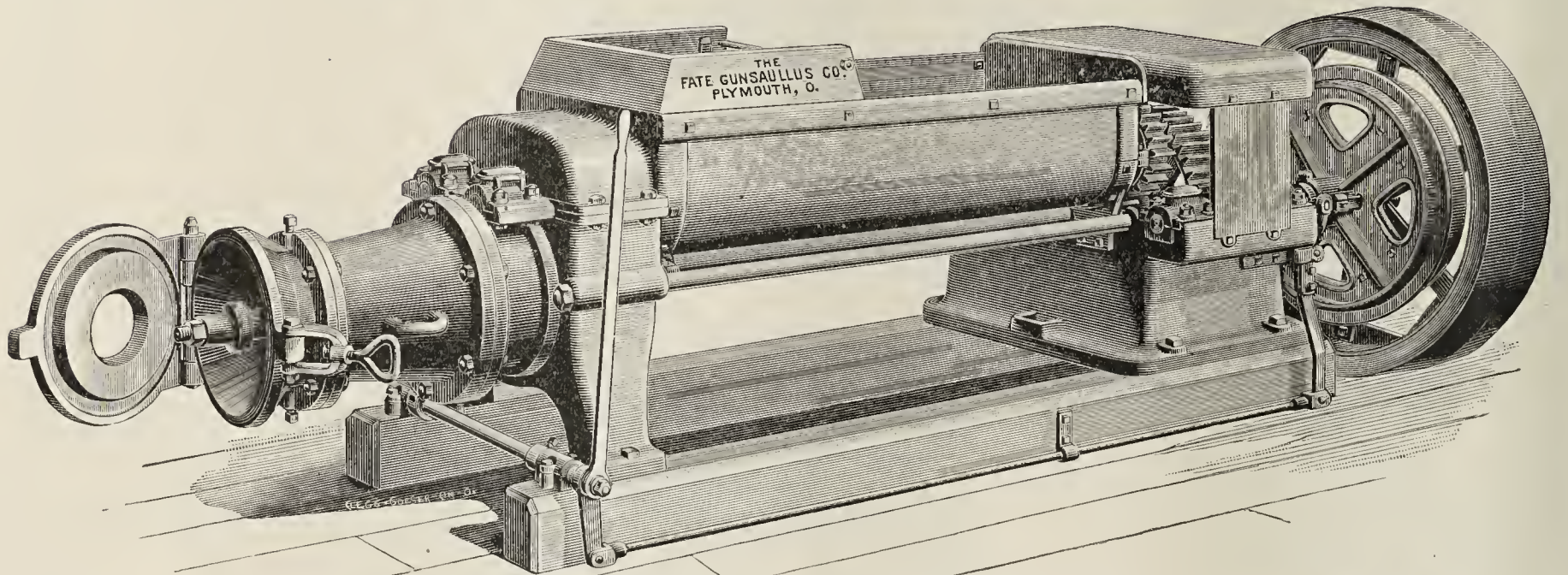


The American Clay- Working Machinery Co.,

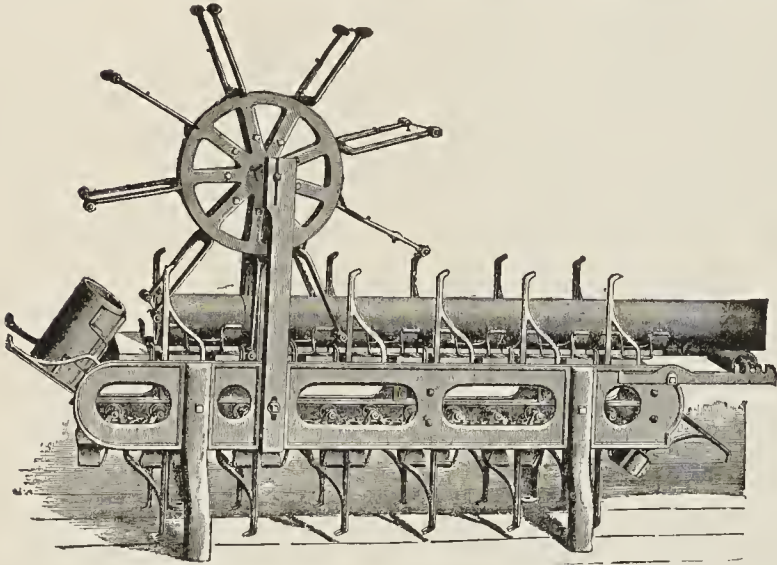
Long Distance 'Phone No. 90.

BUCYRUS, OHIO, U. S. A.

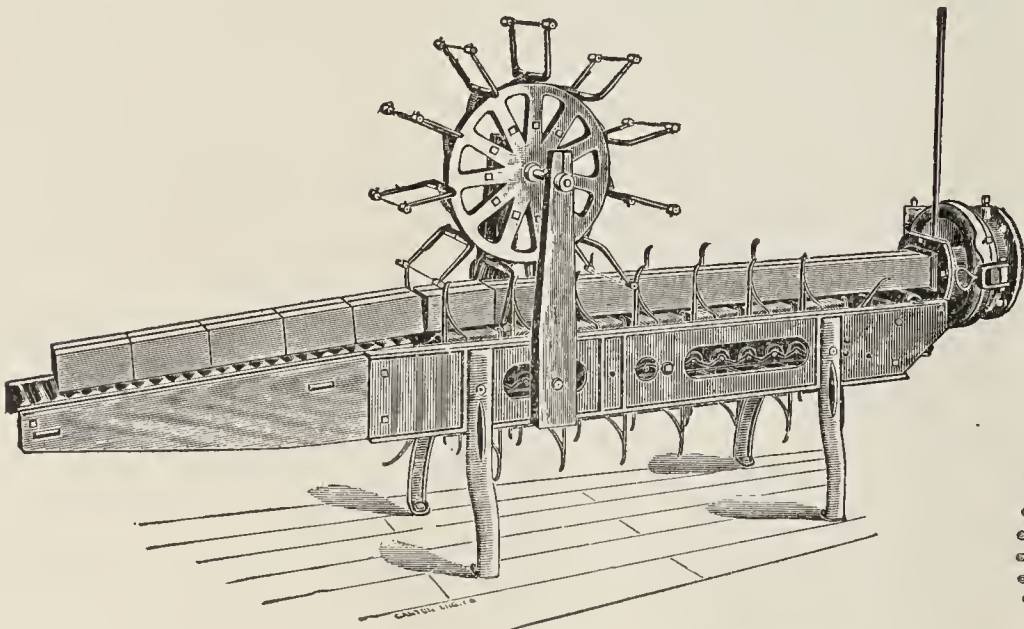
The "PLYMOUTH."



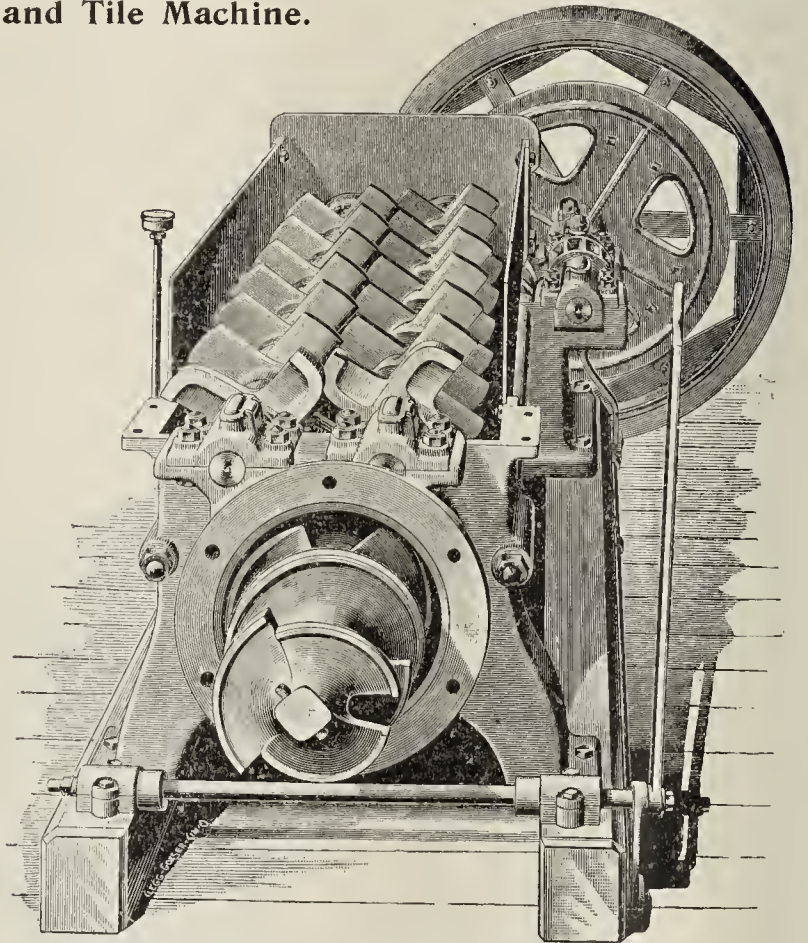
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



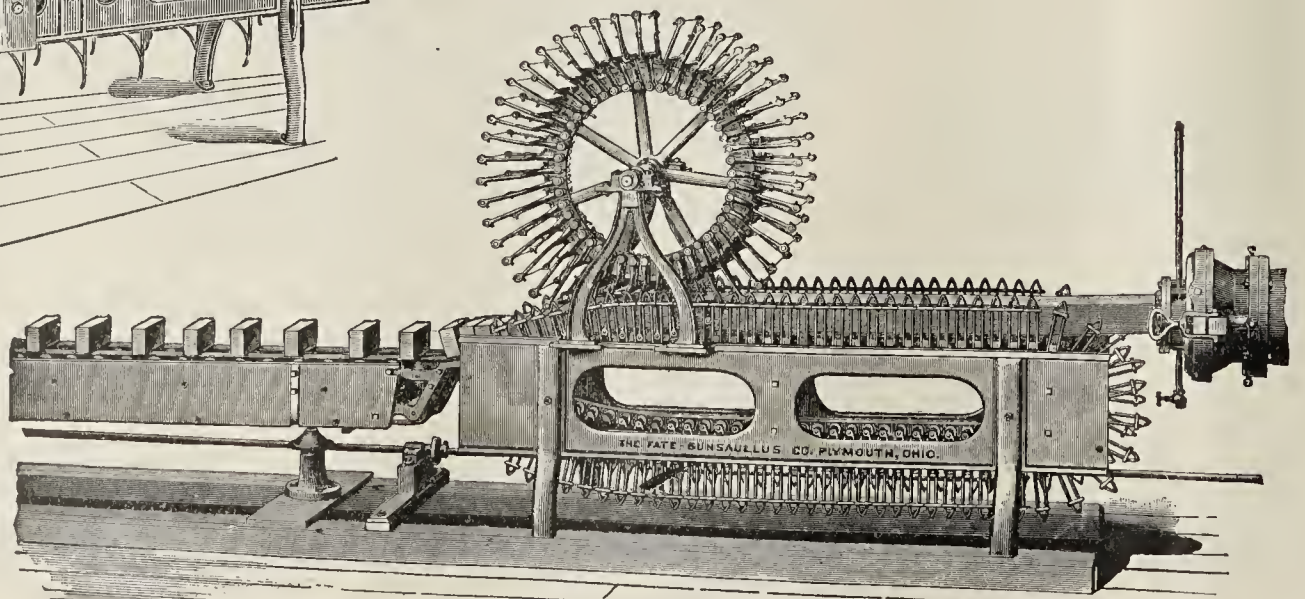
Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



Automatic End-Cut Brick Table.



"HUMMER" (Interior View.)

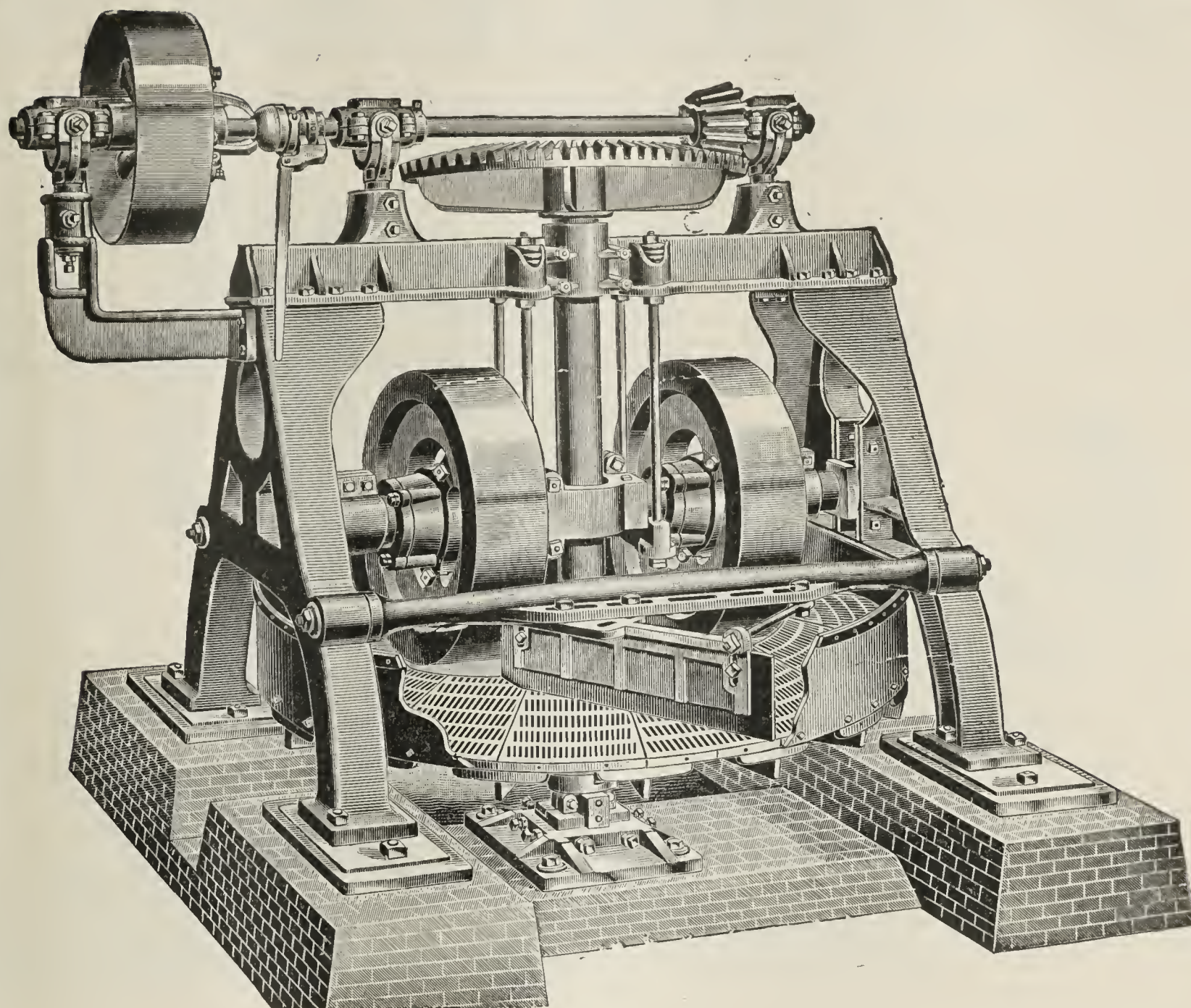


Automatic Side-Cut Brick Table.

Write for particulars to

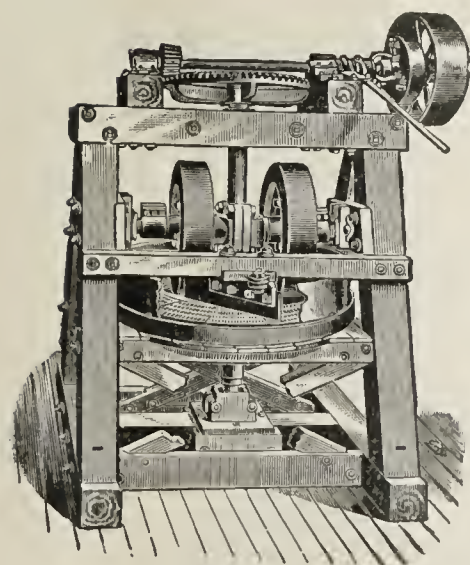
**The Fate-
Gunsaulus Co.,**

PLYMOUTH,
Richland County, OHIO.



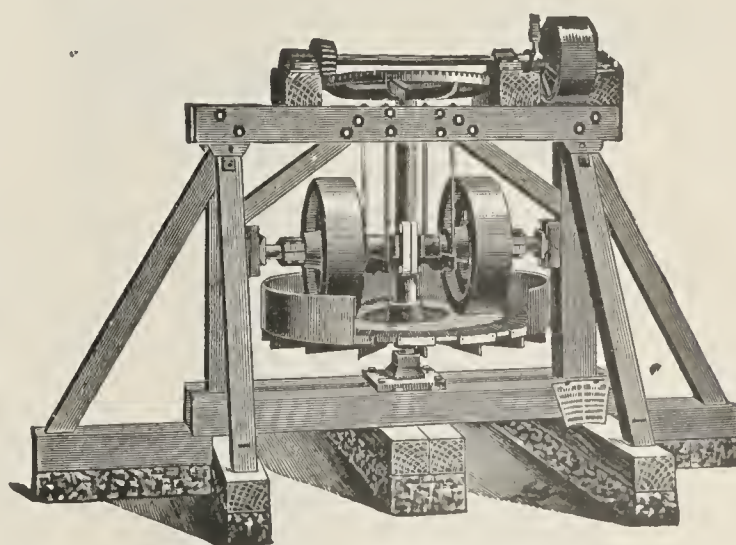
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~



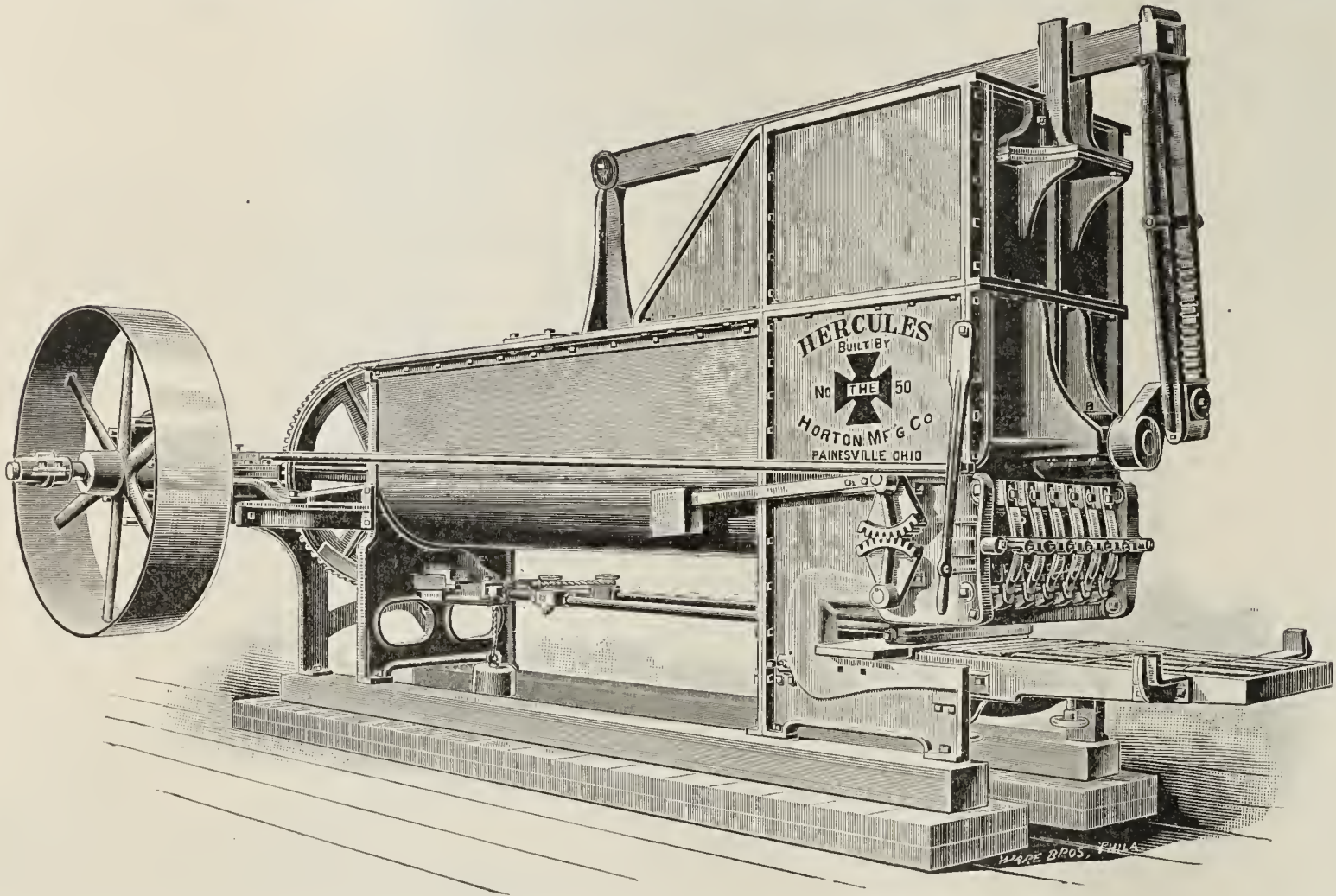
.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

HERCULES.

As its Name Denotes Strength.

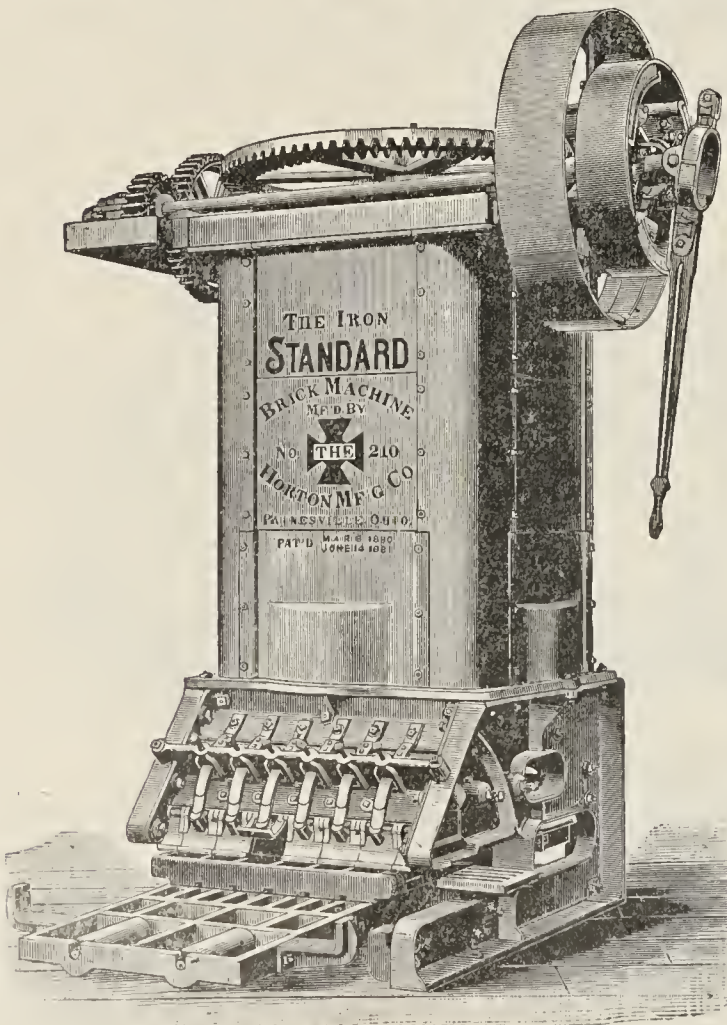
Capacity 40,000 to 50,000
Brick per Day.



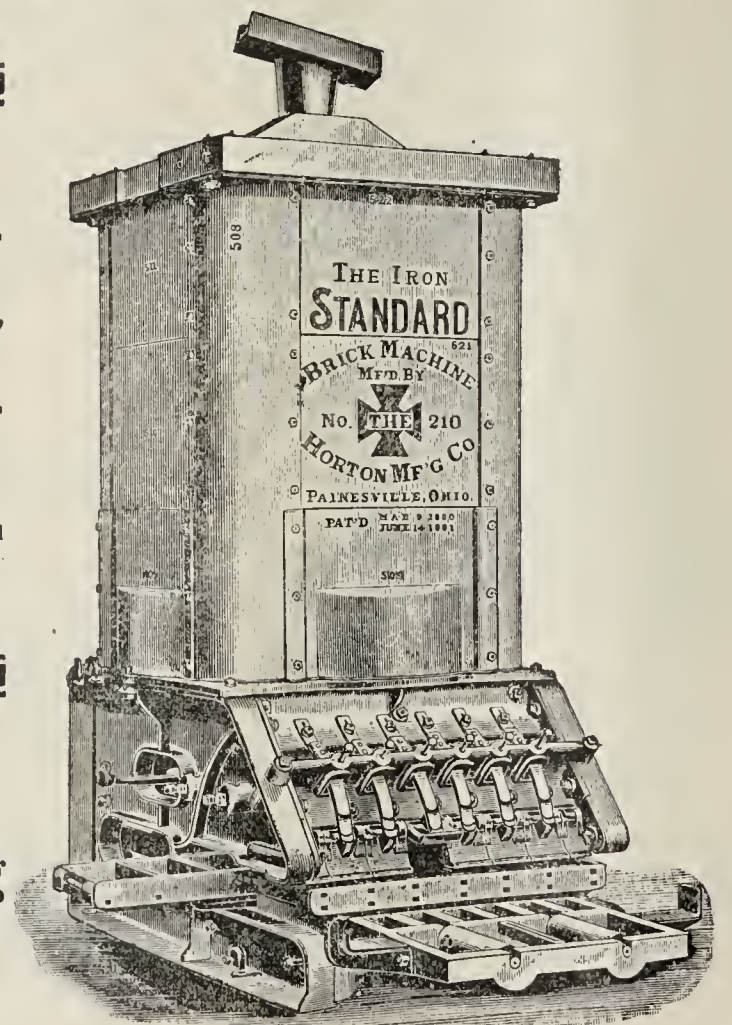
The Acme of Simplicity, Dur-
ability and Capacity.

Do not overlook the fact that this is the simplest machine in the field to-day. We can convince you of the superior merits of our machines in very short order; our illustrated '98 Catalogue gives full details. This machine is a new departure from all other Mold Machines. It is no Experiment, it has features that are found in no other machine built to-day. Do not adopt an out of date machine, write to us for catalogue giving full particulars.

Our Standard Machines.



Mold Sanders,
Disintegrators,
Hoisting Drums,
Pug Mills,
Wheel Barrows,
Dump Carts,
Clay Cars,
Elevators
And the best Mold in
the market.

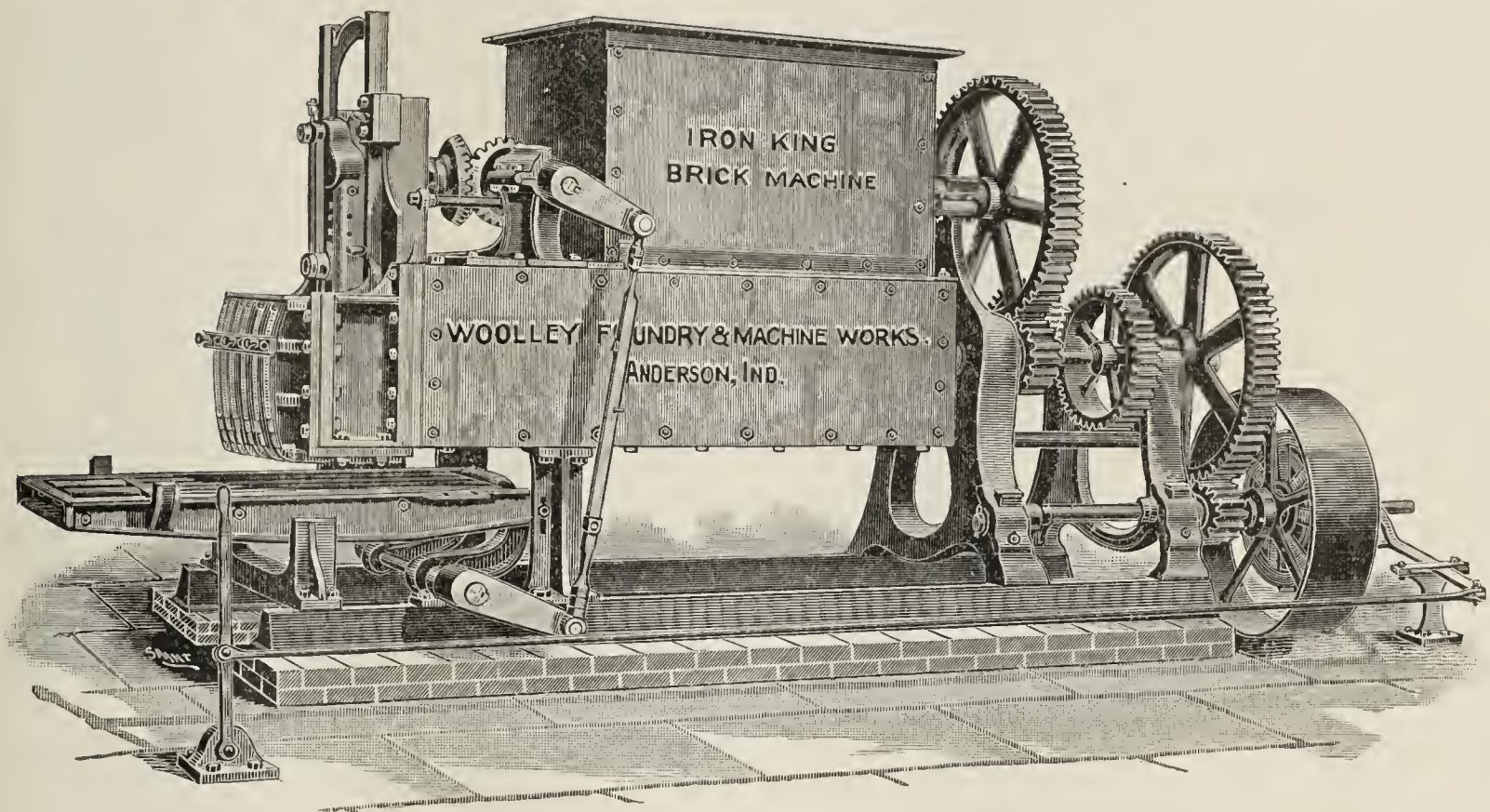


The Horton
Manufacturing
Company,
PAINESVILLE, OHIO.

SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “**IRON KING**” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

WOOLLEY DRY PANS,
PUG MILLS,
SLIP PUMPS
and PRESSES

Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

Mention the Clay-Worker.



From Maine to California.

YORK CORNER, ME., October 25, 1897.

THOS. GOSS,
President.

A. A. HUBBARD,
Sec'y and Treas.

C. & A. POTTS & Co.:

Gentlemen—It give me pleasure to say the two Brick Machines, two mould sanders and two disintegrators I bought of you six years ago are all doing excellent work.

The two No. 4 Disintegrators I can not speak too highly of. They separate the stones, thoroughly disintegrate the clay, and do their work in every way satisfactorily.

The two brick machines make 45 M per day each. The bricks are perfect, as good as can be struck with mud. They are smooth, sharp corners, and struck stiff enough to retain size, while trucking off on pallets or put in racks.

The two Mould Sanders do their work all right—I hear no complaint.

Wishing you success that you merit,

Very truly yours,

J. P. NORTON,
York Corner, Maine.

CITY BRICK COMPANY,

Office, 125 West Second Street.

Telephone Main 788.

LOS ANGELES, CAL., December 20th, 1897.

Messrs. C. & A. POTTS & Co., Indianapolis:

GENTS—It is a pleasure for us to give testimony as to the good qualities of your Iron Horizontal Stock Brick Machine, which we have had in use for the past two seasons.

It gives us entire satisfaction. We have not paid out one dollar for repairs, and the quality of bricks turned out can not be excelled. Our output is 36,500 bricks per day of eight hours.

We will add to this, that, should we need another machine, our first choice would be an ALL IRON POTTS HORIZONTAL.

Yours truly,

CITY BRICK CO.
A. A. Hubbard, Sec'y.

“In every action reflect upon the end; and in your undertaking it, consider why you do it.”—Jeremy Taylor.

And from every State in the Union we have any number of just such letters as the above.



Hundreds of them are in use and every one giving entire satisfaction. We manufacture everything needed on the Brickyard. Now is the time to purchase your supplies for the coming season.

Brick Machines, Disintegrators, Mould Sanders, Granulators, Elevators, Cars, Winding Drums, Moulds, Trucks, Barrows and all Brickyard supplies.

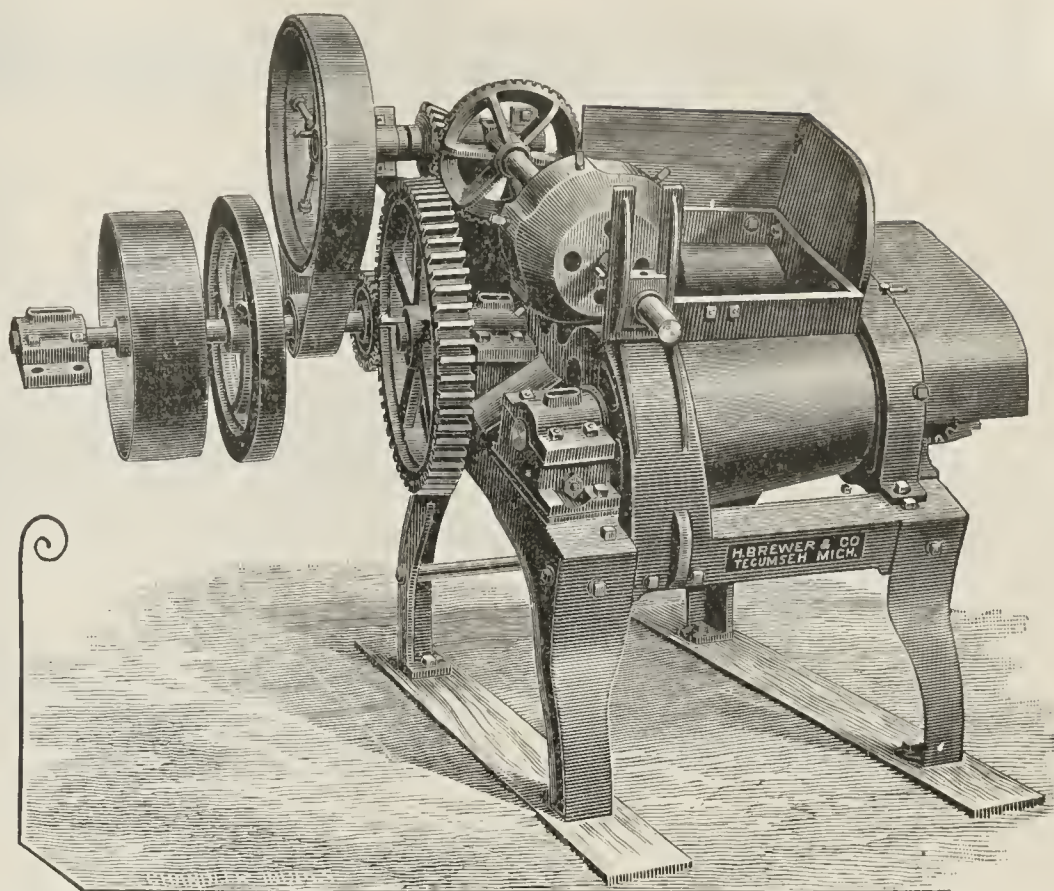
Our prices are low and terms liberal.

C. & A. POTTS & CO.,

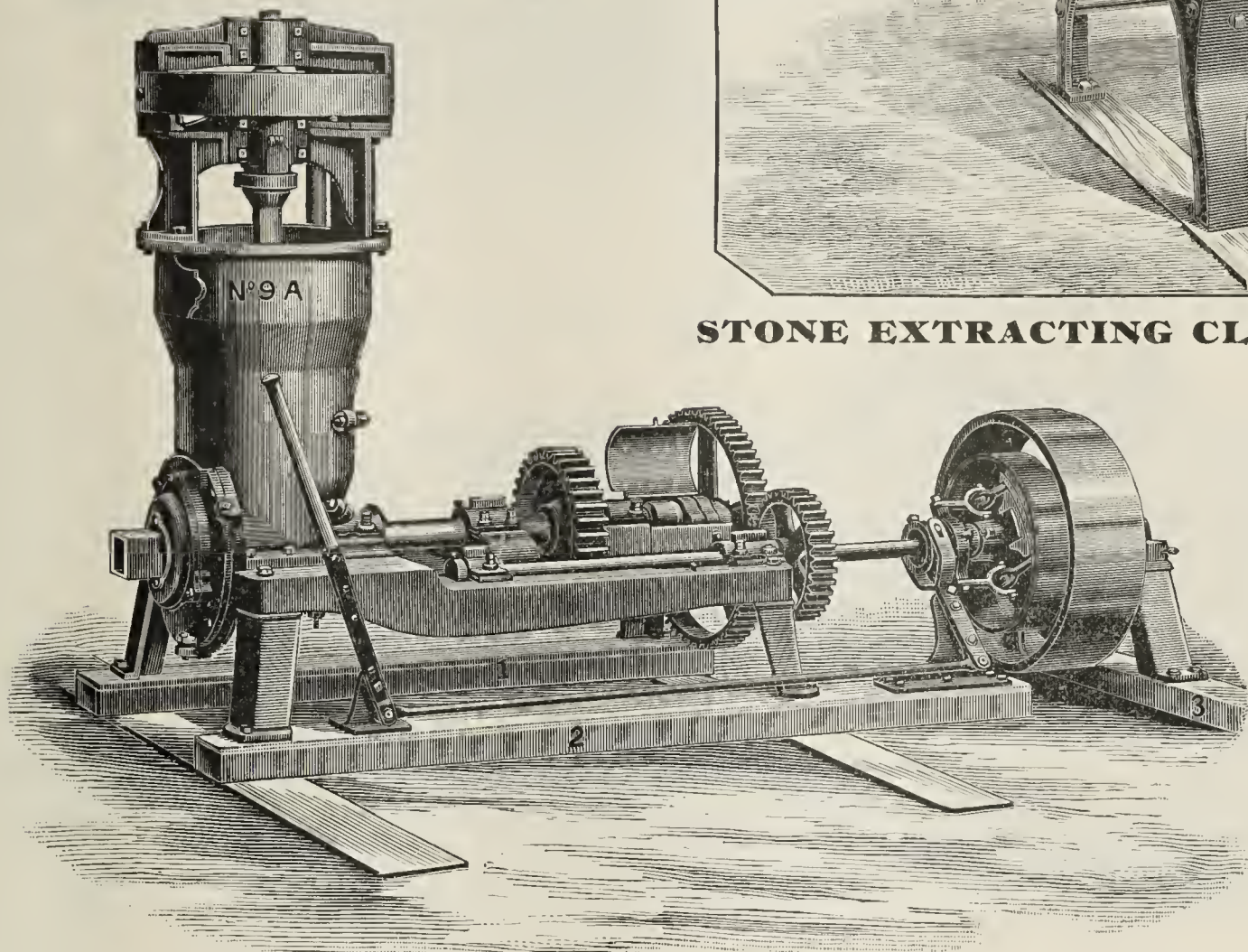
816-828 West Washington St.,

INDIANAPOLIS, IND.

Clay Working Machinery



STONE EXTRACTING CLAY CRUSHER.



No. 9 "A" BRICK MACHINE.

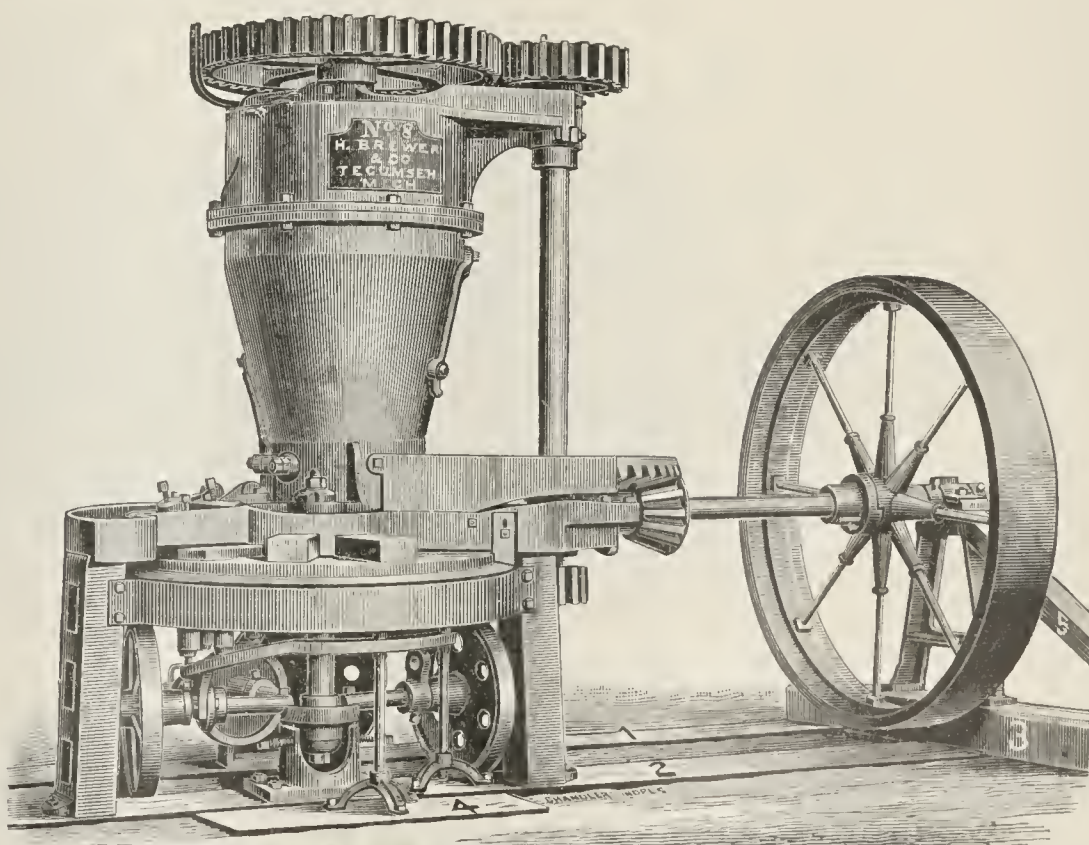
Complete
Brick
and
Tile
Outfits
a Specialty.



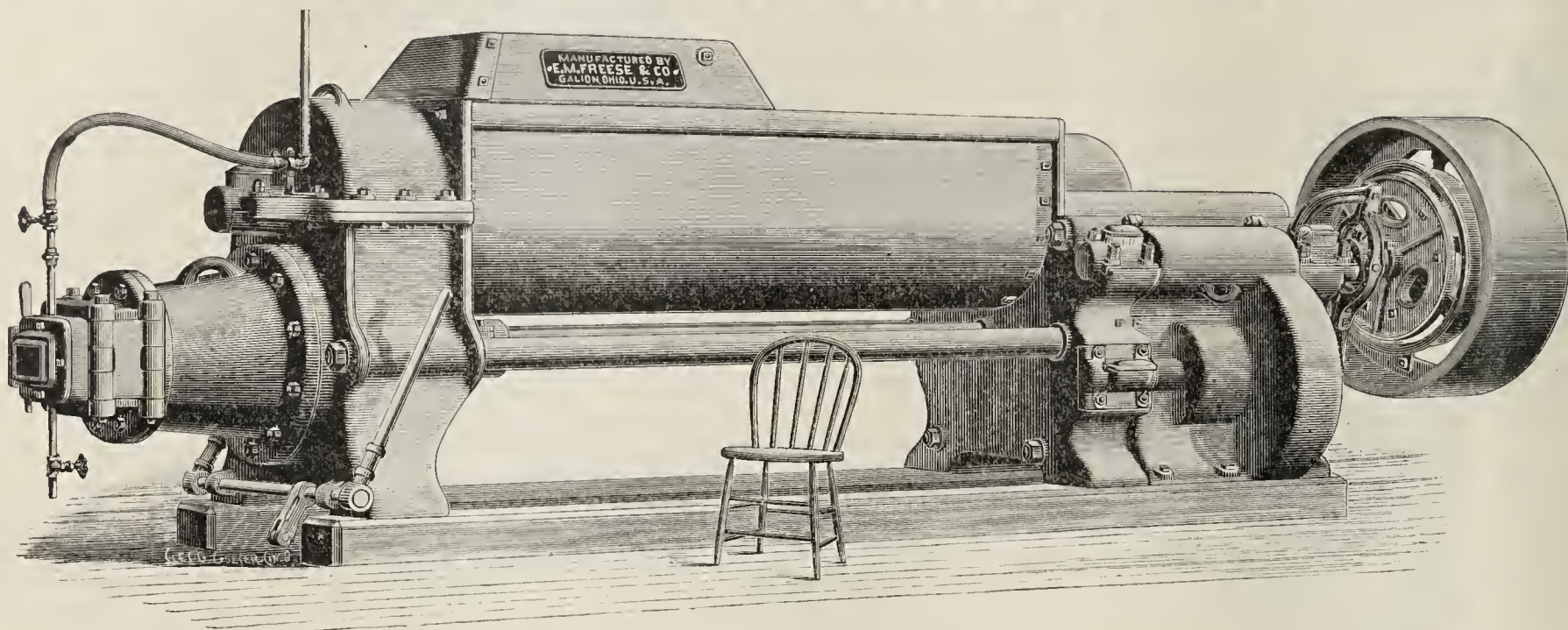
Manufactured by

**H. Brewer
& Co.,**

**TECUMSEH,
. . . . MICH.**

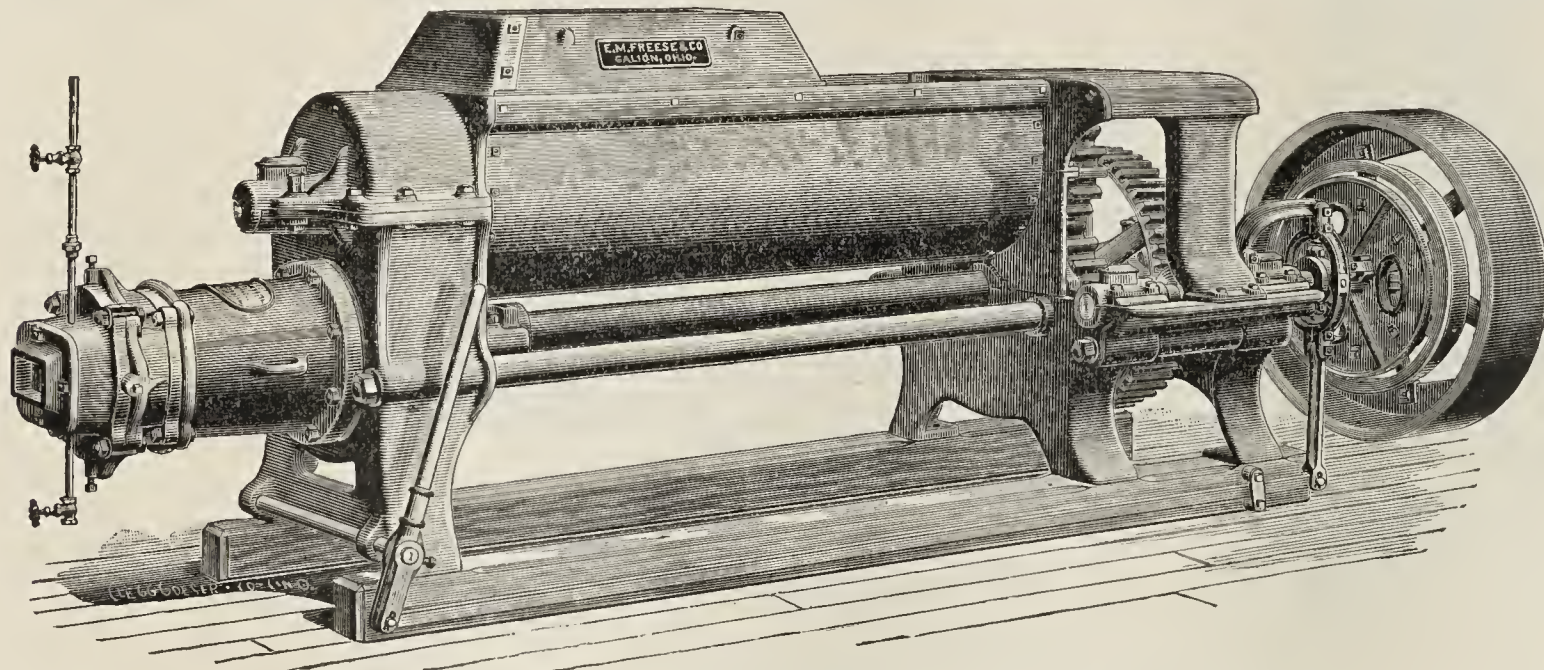


The Original Union Brick Machines



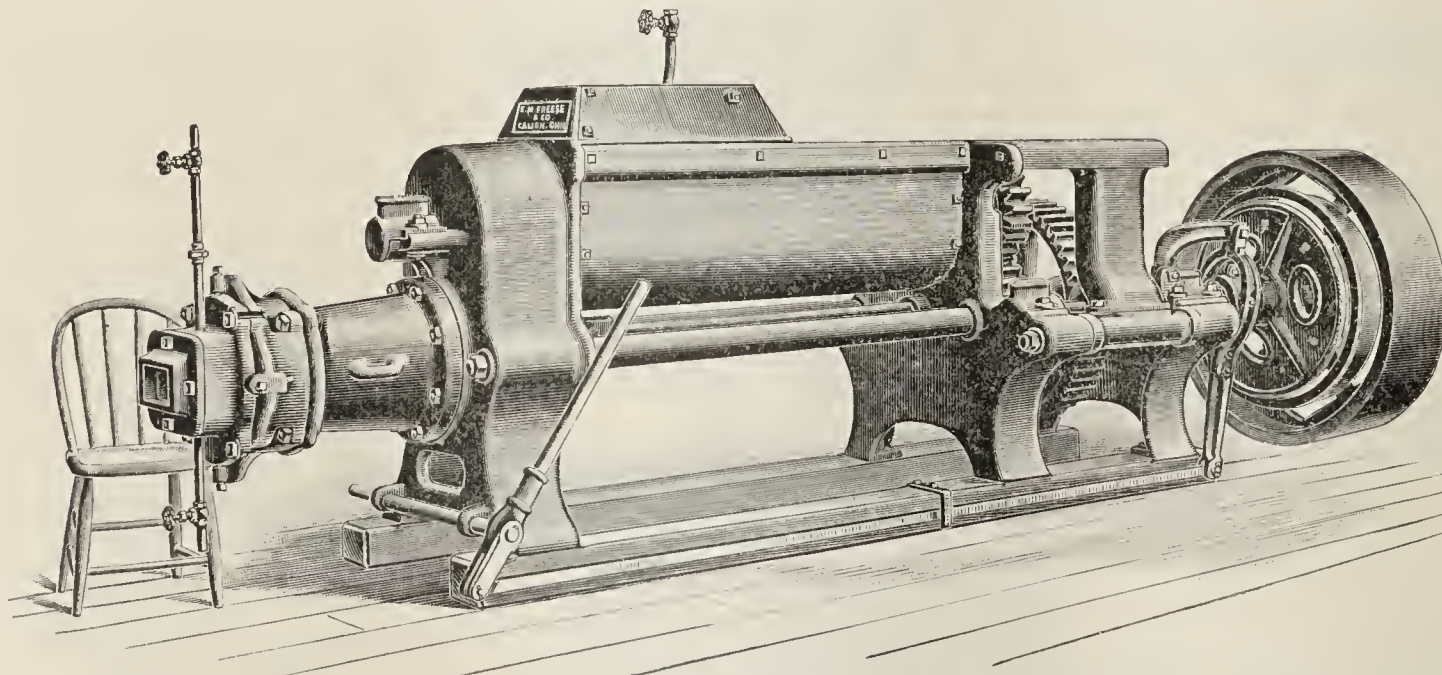
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

These Machines are NOT an experiment.

They are used in fifteen States.

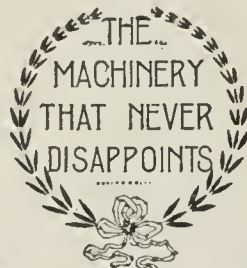
They are a SUCCESS Investigate them.

No separate Pug Mill required.

A Pointed Argument....

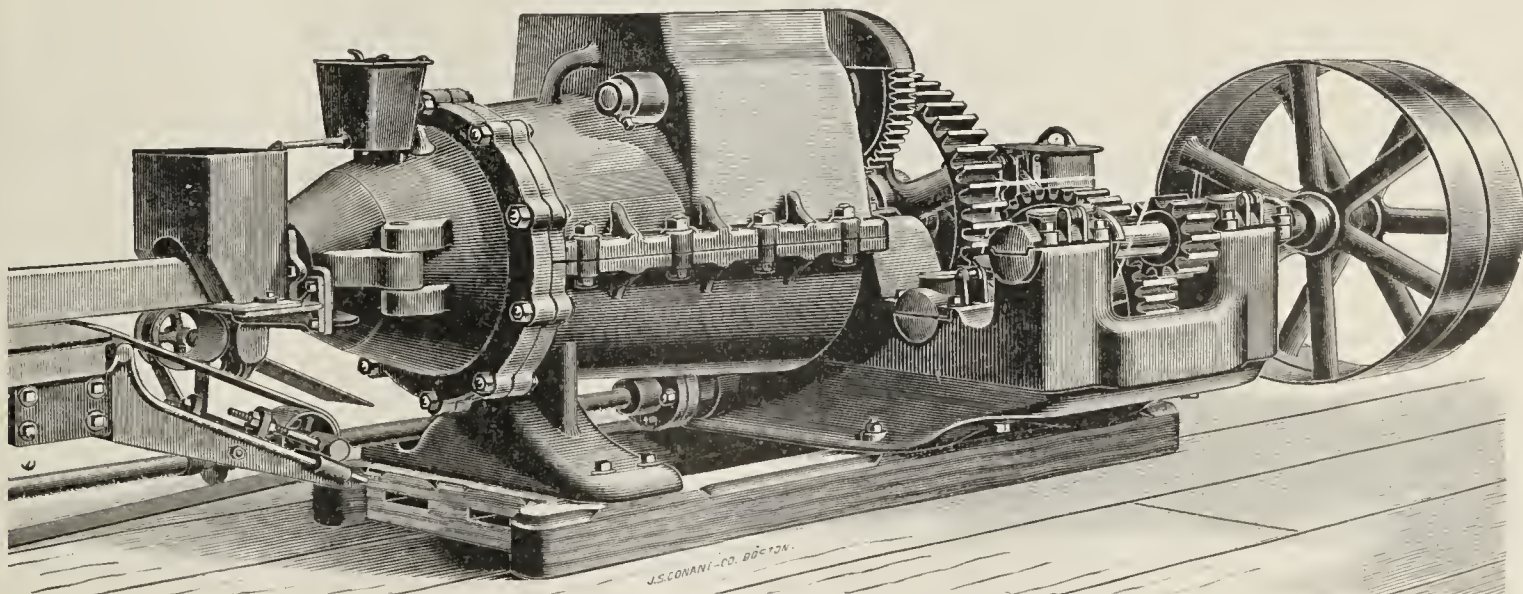


A
Pointed Argument.



In considering machinery there is no argument which should induce you to lose sight of "Quality." The most seductive point that is pitted against quality is price. The salesman who argues cheapness is not your friend. He wants your order but does not care to consider your true interests or your future friendship. The best machinery may be closely counterfeited at a great reduction in price but in the long run the saving will be the most "expensive saving" you ever made. There are numerous places where quality can be lost sight of in machinery and the purchaser be none the wiser until it is too late. One infallible rule of our manufacturing department is that quality is the most important factor. A saving in cost of construction at the expense of quality is false economy which is not allowed in our factory. When you buy one of our machines you get it with the abso-

lute guarantee that there is no faulty material in it. Our machines are faultlessly built, of the best material by most competent workmen—in a word they are **Built Right** and **Run Right**. We manufacture all classes of Clay-Working Machinery. If you haven't seen our new '98 Catalogue send for one.



No. 10 Auger Brick Machine.

The American Clay-Working Machinery Co., BUCYRUS, OHIO, U. S. A.



WHO CAN BEAT THIS SECOND YEAR RECORD?



7,093,000

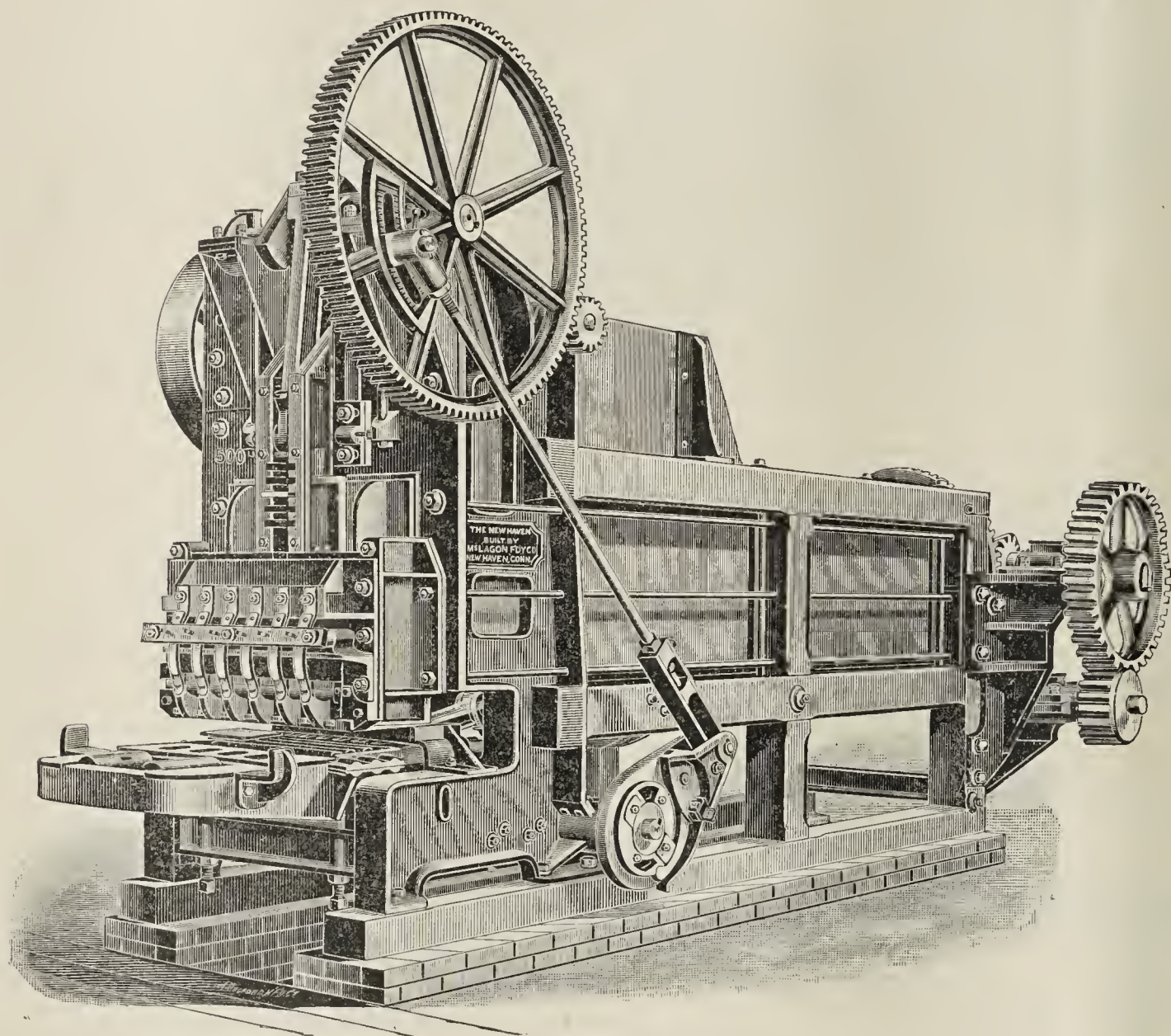
In

Less

Than

Seven

Months.



BERLIN, CONN., Nov. 17, 1897.

THE EASTERN MACHINERY CO., New Haven, Conn.:

Dear Sirs—In reply to your inquiry of September 29th, we would say that our “New Haven” Machine has given perfect satisfaction this season, and with the exception of the ordinary wear and tear seems to be in as good condition as when it was started in the Spring.

Notwithstanding an unusually rainy Summer we have made 7,093,000 brick, which we believe breaks the record for a single machine. It is a self-evident assertion that had we been obliged to stop for repairs that number could not have been made.

Very truly,

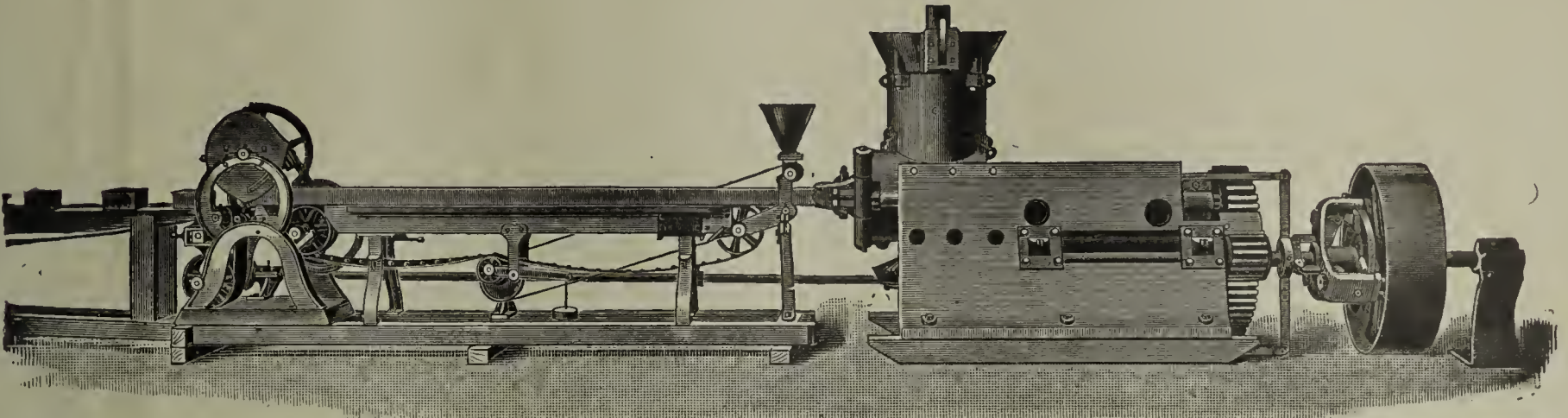
W. L. DAVIS.

We cannot afford to print all the letters we have received in the Clay-Worker, but we have printed a book full of “Reports from Reliable People” which we will mail if you ask us.

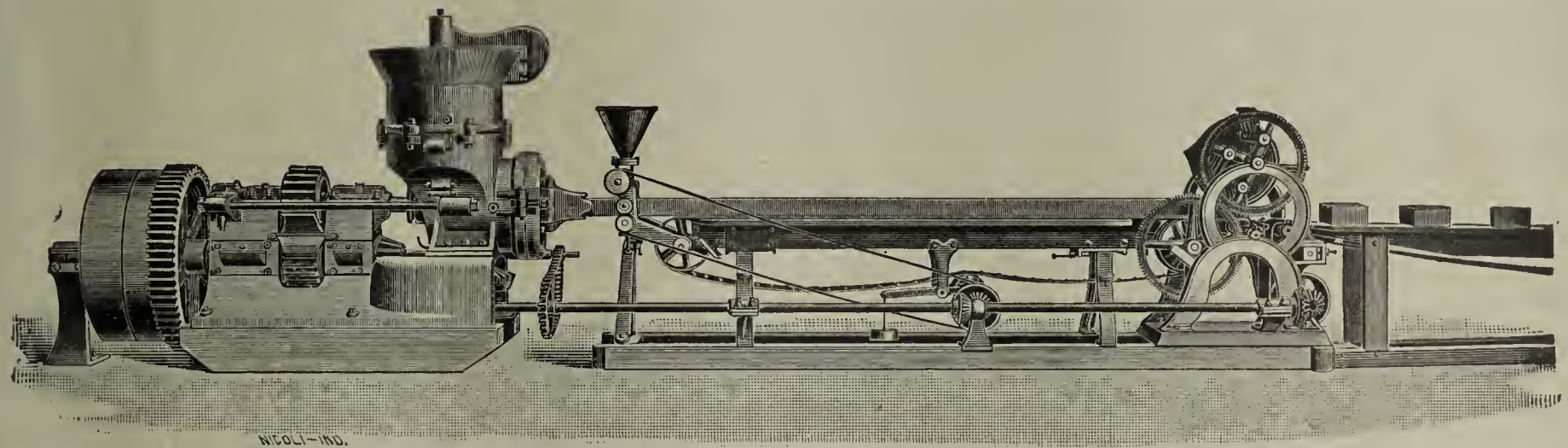
The Eastern Machinery Co.,

NEW HAVEN, CONN.

WONDER MACHINERY.



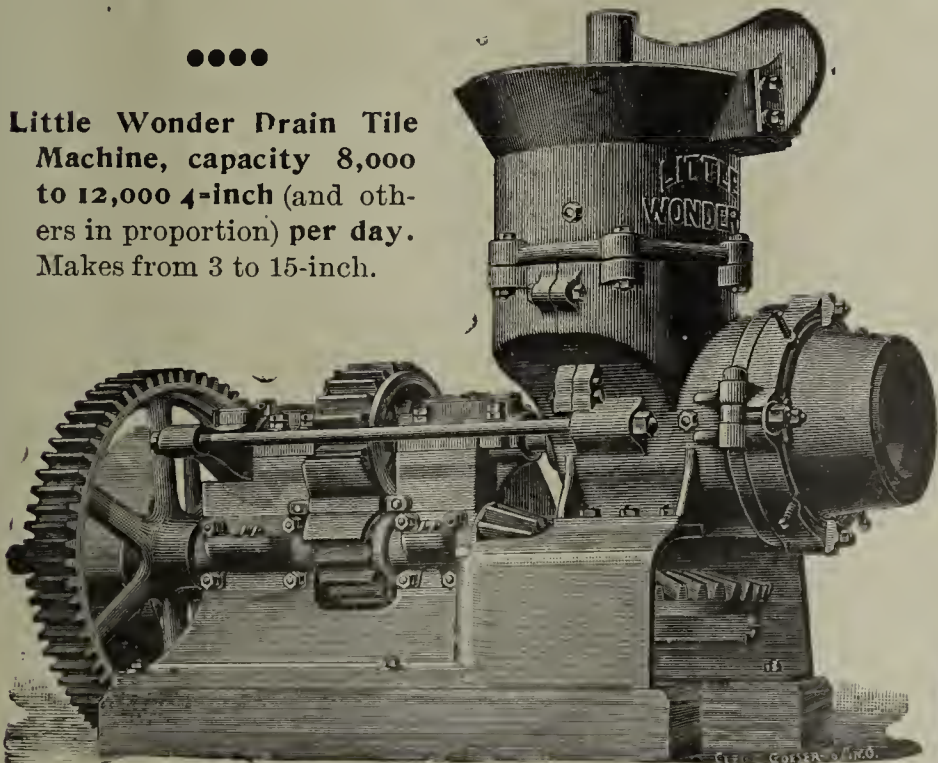
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



THE WONDER BRICK MACHINES have a Great Puging Capacity, therefore, less lamination in the brick. Guaranteed to run with less power and require less repairs, hence, they are "MONEY SAVERS" and MONEY MAKERS."

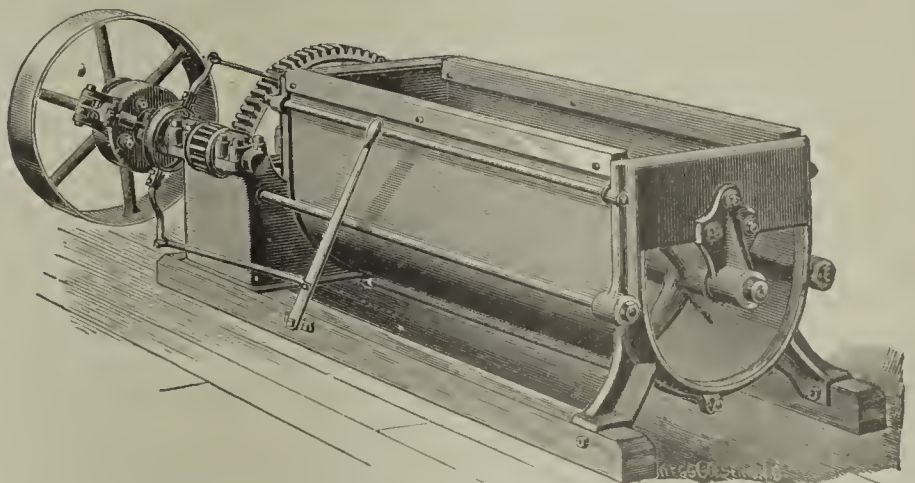
MANUFACTURED BY ~~~

The Wallace Mfg. Co.,
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

Catalogue Free.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity

Iron Clad Dryer.....IN THE LEAD

All Dry Houses Built in 1898
will be equipped with Important new inventions for reducing cost of drying.

...

**Steam
Heat,
Natural
Draft.**



Guaranteed To dry soft mud, stiff mud, dry pressed brick and tile, free from white-wash, disintegration or other injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,
Harrison 296.

CHICAGO, ILL.



DETROIT, MICH.

**The
Best Brick
Dryer
On Earth**

NOTE -

- WE DRY ENOUGH BRICKS ANNUALLY -
- TO BUILD A WALL TEN COURSES -
- HIGH FROM SAN FRANCISCO TO -
- NEW YORK -



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX, No. 3.

INDIANAPOLIS, IND., MARCH, 1898.

\$2.00 a Year in Advance.

THE C. P. MERWIN BRICK CO.

BERLIN, CONN., November 19, 1897.

CHAMBERS BROS. CO.,
Philadelphia, Pa.

Gentlemen:—Answering inquiry as to machinery furnished us last Spring would say, the outfit of Disintegrator, Pug Mill and Intermediate Brick Machine has made us very satisfactory brick.

Yours truly,
C. P. MERWIN BRICK CO.,
Elliott S. Morse, Man.

IT HAS PAID these
firms to use

The—
Chambers
Machinery.

THE PALMER BRICK CO.

ATLANTA, GA., Nov. 13, 1897.

CHAMBERS BROS. CO., Philadelphia, Pa.

Gentlemen:—Replying to your valued favor of the 2nd inst we are pleased to say we have had your machinery in constant use about six years and would not be without it for double the amount of its cost.

We used other machinery for three or four years before purchasing yours and would not have it again if offered as a present.

Every piece of Machinery we have bought from you has been first-class in every respect.

Yours very truly,
PALMER BRICK CO.
W. D. Palmer, Pres.



AUTOMATIC TEMPERED CLAY BRICK MACHINERY,

MANUFACTURED BY

Chambers
Brothers
Company,
Philadelphia, Pa.

J. E. EASTES, Agt.,
Chicago Office,
171 So. Canal St.

THE MILL HALL BRICK WORKS.

LOCK HAVEN, PA., Nov., 5, 1897.

MESSRS. CHAMBERS BROS. CO.,
Philadelphia, Pa.

Gentlemen:—The Side Cut Brick Machine that you sold us last Spring is giving entire satisfaction, both as to quality and quantity of brick we are making on it.

We are now making first-class brick out of clay that the machine yours replaced would not work.

Wishing you success, we are,
Very truly yours,
THE MILL HALL BRICK WORKS,
Geo. O. Salmon, Supt.

THE JACKSONVILLE BRICK CO.

JACKSONVILLE, FLA., Nov. 5, 1897.

CHAMBERS BROS. CO., Philadelphia, Pa.

Gentlemen:—We are pleased to state that we are using your No. C-CD machine in our plant, and it is giving us perfect satisfaction; we make 40,000 brick per day with ease. The repairs during the three years have been very small in comparison with those required by other machines with which we have had experience.

Taking everything into consideration, we think the "Chambers" a success.

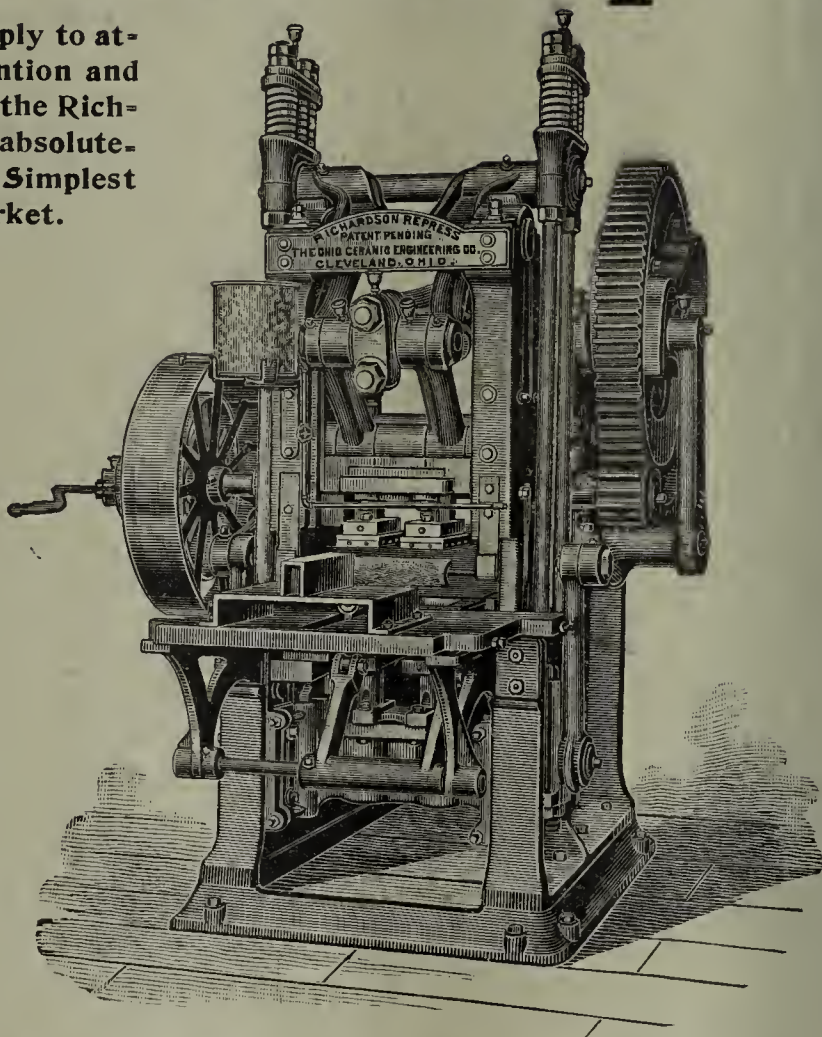
Very truly yours,
THE JACKSONVILLE BRICK CO.,
By W. Moore Angas.

This Black Spot

IS PUT HERE simply to attract your attention and to remind you that the Richardson Repress is absolutely the Best and Simplest machine on the market.

We make all
Kinds of Clay
Working
Machinery.

Let us send
you our
Catalogue.



The Ohio Ceramic Engineering Co.,
CLEVELAND, OHIO.

The Potts Mould Sander.

Simple in Construction, Strong and Durable. Never breaks or Causes Delays.

THE BROCKWAY BRICK COMPANY,

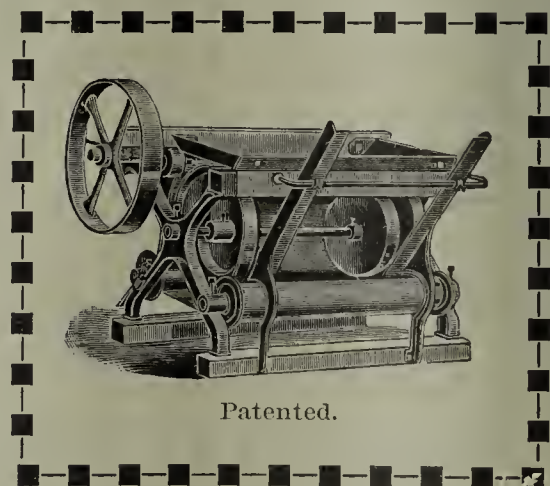
Manufacturers of Superior Quality Building Brick.

Fishkill-on-Hudson, N. Y., October 23, 1897.

Messrs. C. & A. Potts & Co., Indianapolis, Ind.

Dear Sirs—We have used four of your Mould Sanding Machines the past season, and they have given us entire satisfaction, neither one of the four having lost any time from breakdowns, or delays of any kind.

Yours respectfully,
BROCKWAY BRICK COMPANY.



This is a great money maker. A boy does the work better than can be done by hand; no sand wasted; is easily adjusted to suit any size mould.

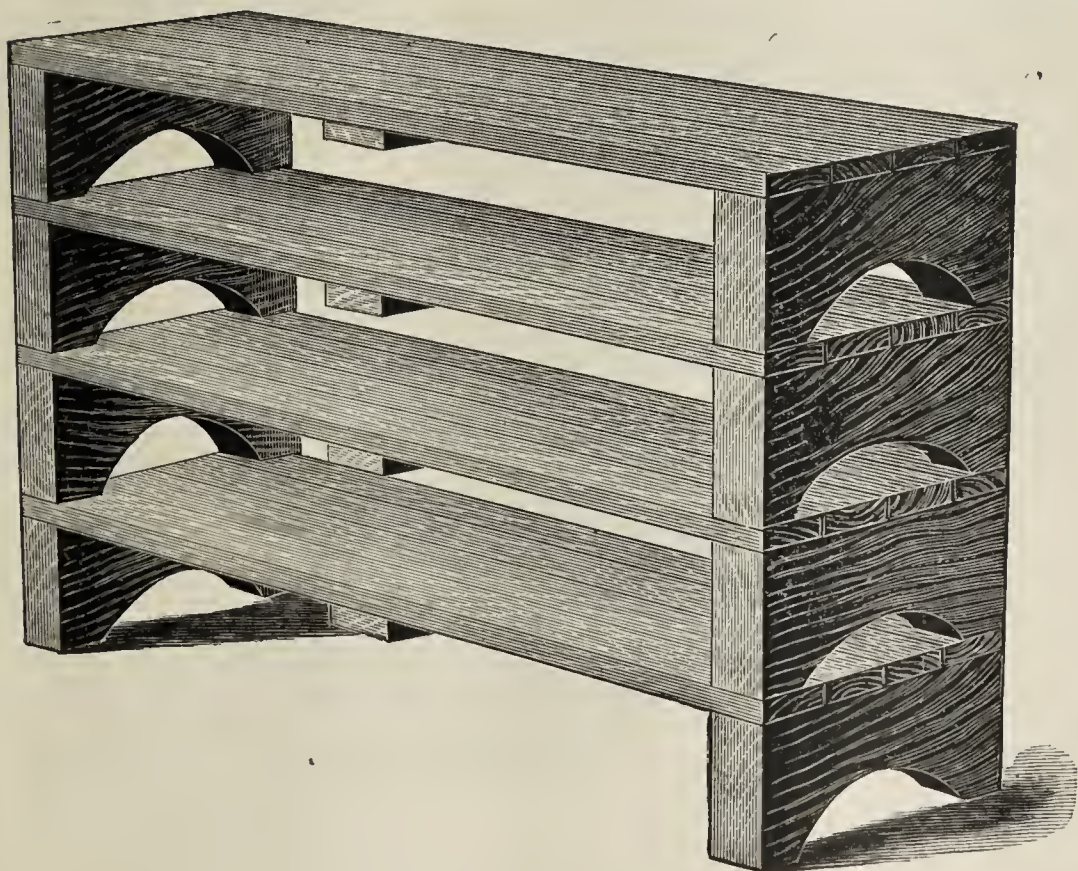
We also make a specialty of Brick Moulds for machine or hand, made of all cherry, bound with extra heavy steel. You will find our prices right.

C. & A. POTTS & CO., 814 to 824 W. Wash. St., INDIANAPOLIS, IND.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.

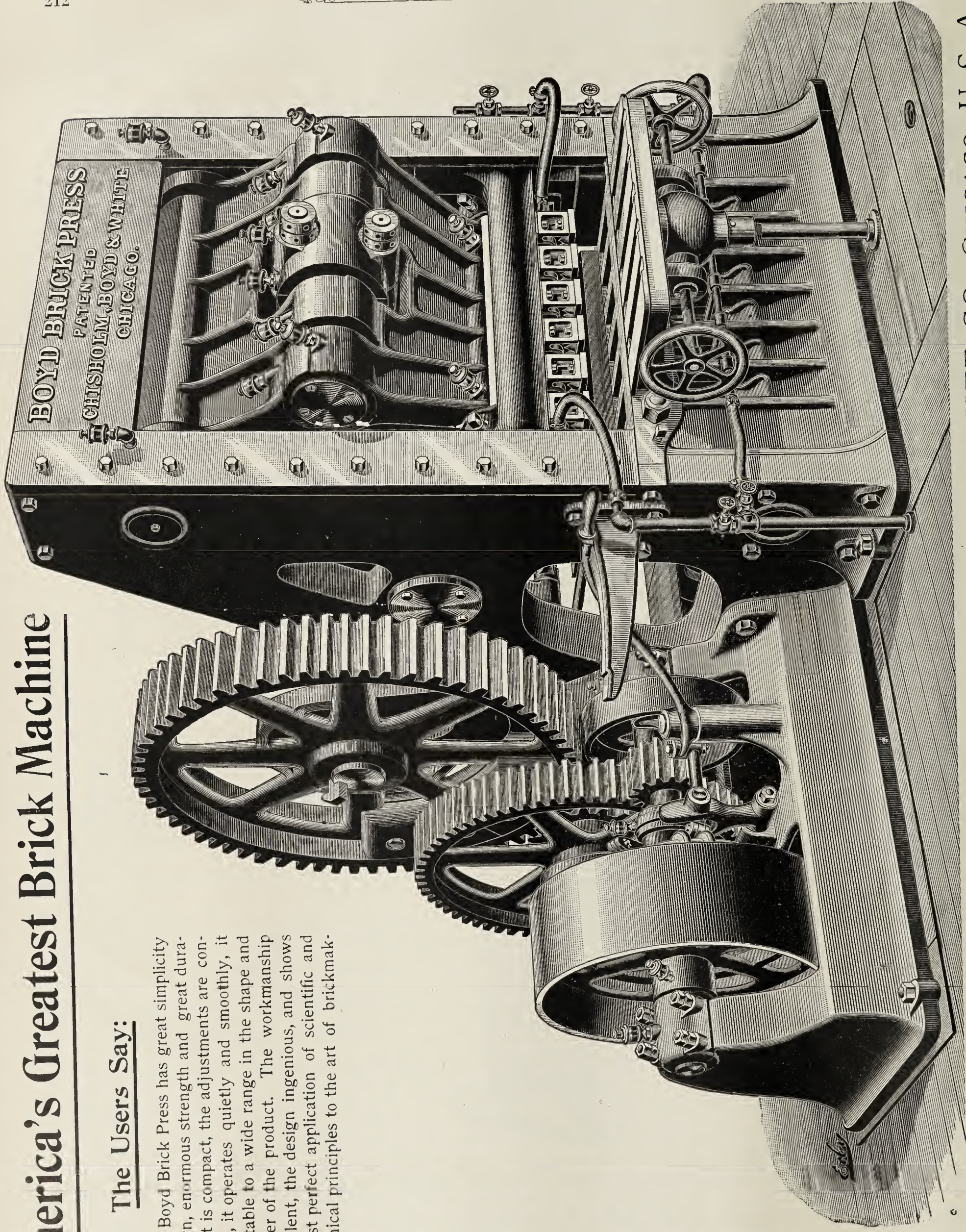
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., = Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

Success for the Brickmaker.

A BRICK PLANT

Equipped with our machines and system is universal in its work, and will produce at lowest cost per thousand, common building brick and fire brick, as well as high-grade front or face brick.

NOT THEORISTS.

We are not theorists. We are practical business men—engineers in our profession. We have made a success of our business by making success for our customers. The Brick Plants designed, equipped and started by us are living monuments of our success. The Boyd Presses sent on trial have always enhanced our good name and remained to charm our customer.

WHERE ARE YOU?

If the Brick Machine Maker won't guarantee you satisfactory burned brick from your material, don't you think you better find some other machine man who will do so, or else abandon the enterprise? Surely there's danger some where, and the machine man knows it. If he gets cash or notes for his machine he's safe, but where are you?

A STRAIGHT OFFER.

The Boyd Brick Press will be placed upon the yard of any responsible firm on trial, and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the brick shall be satisfactory after being burned.

Pressed Brick, Fire Brick, Paving Brick, Common Brick.

A....
SURE
THING

FOR
BRICKMAKERS.



We will construct and equip a Brick Plant of any capacity desired, for any responsible party, furnishing Brick Machines, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of Brick, and turn the Plant over to him in proper working order, under guarantee of satisfactory results as to quality of product and cost per thousand; the loss to be ours in case of failure.

CHISHOLM, BOYD & WHITE CO.,

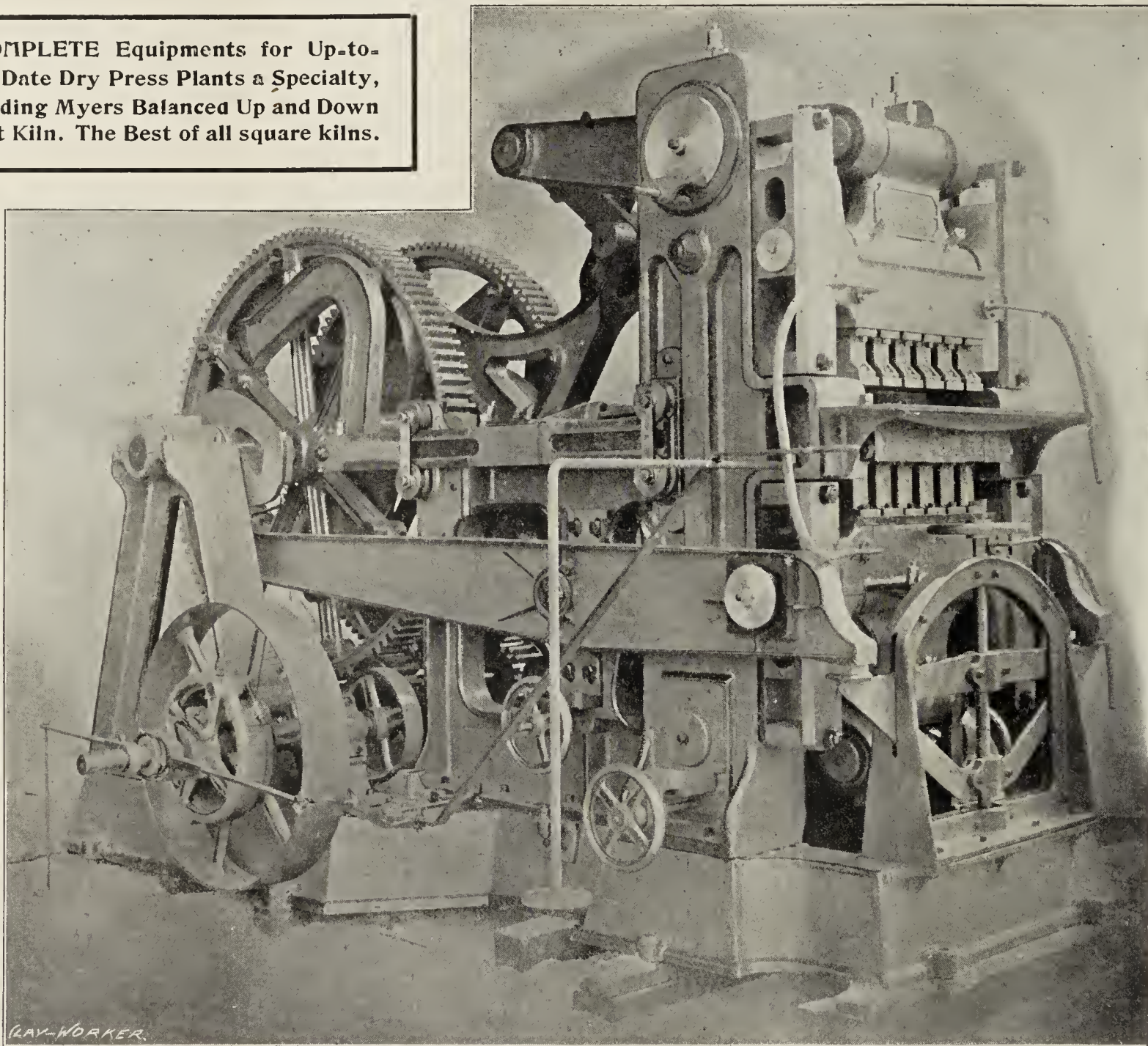
OFFICE AND WORKS:
57th and Wallace Streets.

CHICAGO.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine-maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments for Up-to-Date Dry Press Plants a Specialty, including Myers Balanced Up and Down Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

ST. LOUIS, MO.

CLAY WORKING MACHINERY

The Simpson Brick Press,

The World's Standard.

Used by the most successful brickyards throughout the United States and Canada.

We manufacture a complete line of Clay-working machinery.

Do not experiment. Invest your money in a **SURE THING**.

Complete plants constructed and guaranteed. Write for catalogue.

**The Simpson
Brick Press Co.,**

Manufacturers and
Contracting Engineers,

OFFICE AND WORKS:

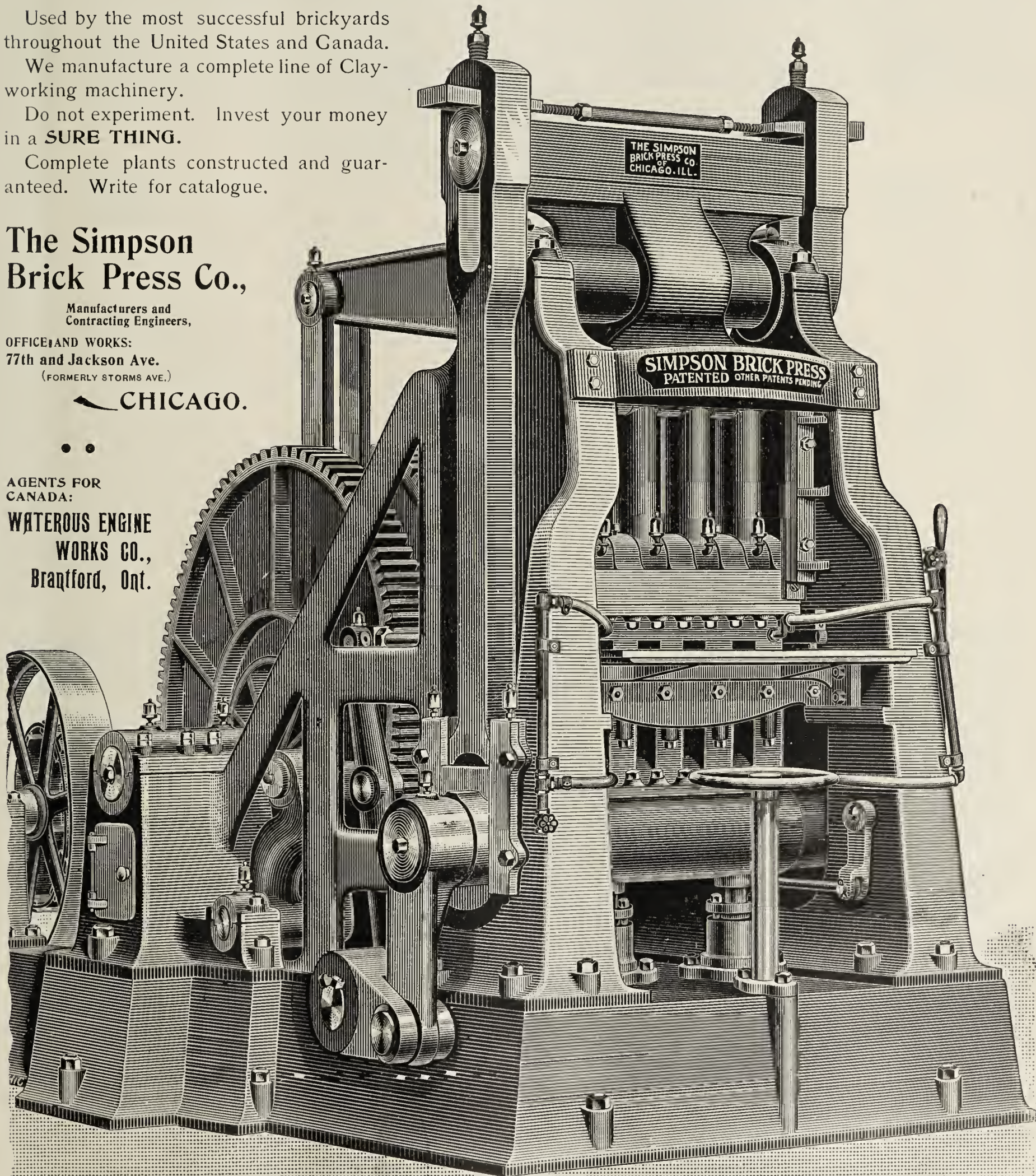
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HUNDREDS OF THOUSANDS of dollars are invested in the brickmaking industry. The Convention of the N. B. M. A. just held at Pittsburg, represented capital from all sections of the Union. Men gathered at the Convention to exchange views, experiences and ideas. Some of them told of successes; others told of failures. It is safe to say that the delegates whose successes were greatest were owners of the best equipment and the best Drier. No matter how experienced or how practical a man may be, he can't meet competition at this end of the century unless he has a first-class plant behind him. We think it within the bounds of reason to say that, of the many thousands invested in the brick industry, no portion of it is so profitably invested as the dollars paid out for

The STANDARD IMPROVED BRICK AND TILE DRIER.

It stands to-day a model of excellence because of its supreme simplicity and its effectiveness.

It is adapted to the drying of **all varieties** of clay products.

It can be adjusted to suit clays of different nature, much the same as a monkey-wrench can be adjusted to fit nuts of different sizes.

This is because of the absolute control which the operator has over the elements of drying—heat and circulation.

If you didn't get one of our new pamphlets, ("A Drier that Makes Money") at the Convention, drop us a line and we will send you a copy.

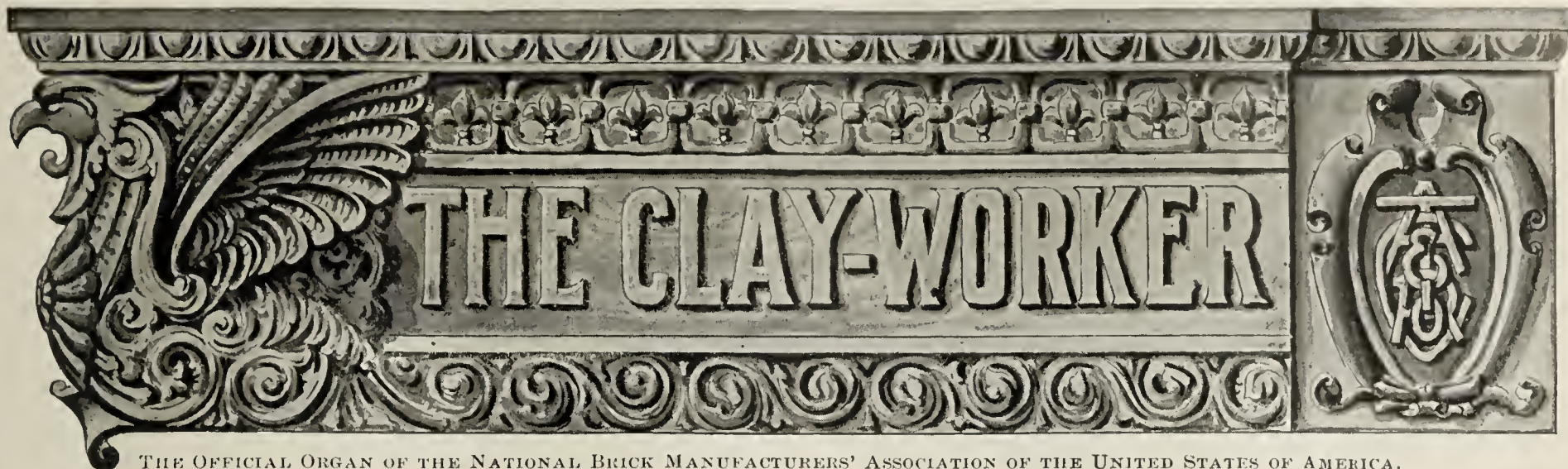
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THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX.

INDIANAPOLIS, IND., MARCH, 1898.

No. 3.

Written for the CLAY-WORKER.

A GREAT NEWSPAPER BUILDING.

ONE OF THE MOST ATTRACTIVE and at the same time one of the best specimens of architectural terra cotta work in the city of New York is the building erected for the publication of the New York Herald. This edifice is in several of its features decidedly unique and consequently receives a great deal of notice, both from residents and visitors in that city conspicuous for the number and magnitude of its lofty structures devoted to the uses of modern business methods and the palatial living of its cosmopolitan population.

Some of these singular characteristics will be apparent to the casual observer who may refer to our illustration of this building, especially its beautiful and artistic adaptation to the purposes for which it was designed and constructed.

The building occupies an entire block, being surrounded on three sides by wide thoroughfares, while the south facade or main entrance opens upon a small triangular park; Broadway on the west and Sixth avenue on the east are both main

arteries of travel, being furnished with cable and elevated and horse-car railroads.

ability of such a newspaper to earn the cost and support of such a workshop, without the assistance of other funds derived from rentals. In this respect there is a vast difference between this building and those of the New York Tribune, New York World and the New York Times, the publication offices of which are hidden in among the offices of lawyers, brokers and speculators, all, it is true, contained in massive and lofty structures, but all without any distinctive quality to suggest the workshop of a great newspaper.

These lofty towers, reaching up almost to the clouds, may be big, but they are not beautiful, nor can be, but they are evidences of speculation and a spirit of money-getting which, although allied to the publication of a newspaper, are in no way connected with its purpose or the profession of journalism; therefore, when we find a great newspaper, building and occupying for itself a home and workshop, it is an evidence of self-reliance and of confidence in its ability to stand alone, earning its own support.

The owner of the Herald building had no wavering faith in the ability of his journal to support an entire building for its



TERRA COTTA TYMPANUM, NEW YORK HERALD BUILDING. Executed by Perth Amboy Terra Cotta Co.

The verdant garden of Herald Square Park, with the peculiar formation of the street intersections at this point, furnish an unimpeded vista and a full day's sunshine, which, with the rustling leaves of the trees, are continual reminders that there is an outer world beyond the noise and rattle of the iron tracks, the tramp of horses and the hasty passing of foot passengers.

The observer will perceive that the owner of this building had a single controlling purpose in view when he had this building designed. He wanted above all to have a workshop for the making of a great newspaper, and he had faith in the

workshop, for we see that he spared no cost in either material, labor or skill to make it not only perfect as a workshop, but as beautiful as the artistic ability of architecture would permit. No merely useful block of common materials did he desire and build, but he erected a suggestive and artistic structure which should at all times attract general notice, give pleasure to the observer, and proclaim its purpose, and always be an architectural feature in the panorama of Greater New York.

The materials chosen were polished granite and choice marbles from the workshops of nature, and the humble clay manipulated with the skill of the most ancient human art and made permanent in the chemical laboratory of fire. It is with the latter (terra cotta) that we, as clayworkers, are most in-

terested, and we may well feel proud of the prominent part which our craft performed in the construction of this notable building.

We have, by the kindness of the Perth Amboy Terra Cotta Company, who made the terra cotta work, been furnished with the photographs from which our illustrations have been made. These show the quality and style of the ornamental designs, which were made by the eminent architects, McKim, Mead & White, a firm which has done as much, if not more than any other, to elevate the clayworker's art of the United States to the prominent position it now occupies among the building materials of this century. With the exception of the granite columns and the plain marble surfaces of the panels, the entire walls are outlined and covered with ornamental terra cotta. Enriched pilasters, foliated capitals, sculptured tympanum and elaborate cornices, all lend their aid to make this building a

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK—Sixth Paper.

—Glazed Brick.—

IN THE LAST paper we have seen from what sources we obtain our glaze ingredients. Let us now consider how we must combine them in order to obtain the glazes we want. But before all we must know what conditions we have to deal with in glazing brick. First, of course, comes durability. The brick must withstand the attacks of the weather, they must be frost proof. This is not so simple a matter as it seems since it is known that glazing the surface of a brick accelerates the destruction of the latter. This has been demonstrated time and time again by exposing brick, glazed and unglazed, made from the same clay and burned at the same heat, to the weather. The glazed brick were invariably found to succumb sooner than their less pretentious neighbors.

As we all know ice is the greatest enemy of our building



NEW YORK HERALD BUILDING. McKim, Mead & White, Architects.

monument to the skill of modern clayworkers. The terra cotta is of a cream white color, and has well maintained its original color, owing to its hard and thorough burning, which has made it almost impervious to the grime and dirt of populous streets.

The difficulty of making terra cotta of a white color has done much to change the demand, and our architects have recently adopted the use of neutral colors, such as gray, bluish gray, and various shades of light browns; also, we see evidences of a return to the use of natural red colors in the near future.

JAMES TAYLOR.

A FIXING BRICK.

A double dovetail fireproof fixing brick has been devised to take the place of the ordinary wooden fixing block or plug, and will prove useful in chimney breasts for holding the skirting boards together and for securing to walls heavy advertising boards and the like.

material owing to the fact that water expands when freezing, the increase in volume being one-ninth of the total volume of water. When water freezes in the pores of a brick a pressure is exerted upon the pore walls. If these are strong enough to withstand rupture the ice is forced through the pore openings in needle-like crystals, which, of course, correspond in thickness to the size of the pores. From this illustration we see that ice under pressure acts somewhat like a fluid. Now, if the pores are large less force will be required to expel the ice through them than when they are fine and the ice has to escape in very fine needles. In the latter case the tension existing in the brick tends to burst, to destroy the latter, while in the former, if the brick is well burnt, the large pores afford sufficient room for the expansion and the pressure upon the pore walls will not be great enough to do any harm. That this is true can be observed by comparing a fine grained and a coarse clay, burning them to the same heat without vitrifying them. It will be found that the coarse grained clay has the best of it. For the same reason adding sharp sand to a clay



A BIT OF TERRA COTTA FRIEZE, N. Y. Herald Building.

renders the latter more frost resistant. It also explains why soft mud brick are often more weather proof than dense brick made by the stiff clay process. It should be accepted as an axiom that if a brick absorbs water opportunity must be given for the latter to escape readily, if this is not done the ice will certainly exert its destroying power.

If now a surface of the brick is covered with a vitreous coating the ice cannot escape in that direction at all and a great tension is produced in the interior. A tendency thus exists to burst off the entire layer of glaze, which is a matter of a comparatively only short time, unless the pores are large enough to allow of the necessary expansion.

Hence there are only two ways in which to secure brick from the bad effects of freezing. The body either must be so porous, yet hard burned, that the ice can escape without causing a great pressure upon the pore walls, or it must be vitrified to such a degree that little or no water is absorbed. In glazed brick this must be carefully considered and the body must be compounded accordingly, or the burning temperature raised. It is hardly necessary to state that the best way is to vitrify the glazed bricks thus doing away with the possibility of danger.

Next to the durability of the brick body, the weather resisting power of the glaze or enamel must be considered. A glaze cannot be regarded as a protection to the brick. In order to be considered durable a glaze must have combined firmly with the body and must be proof to all atmospheric influences. For this reason the glassy coating must mature at a temperature at which the body reaches the point of vitrification or nearly that. Only by doing this is a firm bond between body and glaze established. The weather resisting power of the glaze itself is likewise of great importance. We may regard it as a safe rule to say that the resisting power of a glass increases with the temperature at which the same melts. For instance a glaze containing a large proportion of lead cannot be considered as being durable. Such a glass is attacked by the acids of the atmosphere and the work of decomposition proceeds quite

rapidly. The lead and alkali compounds are dissolved out, the coating becomes iridescent, small scales keep coming off and finally the entire glassy surface is destroyed. All of us have seen examples of such work, where a red burning clay, having a low finishing temperature has been coated with a soft lead glaze. At first the brilliant gloss of the ware thus decorated makes quite a show, but soon on exposure to the weather its weakness begins to tell. The use of a lead glaze may be excusable on such a body, but to use a soft glass on a fire clay body is hardly pardonable. The writer had occasion to observe glazed brick carrying a lead composition on a good fire clay body. In this case a glass entirely free from lead could have been used and a glaze being many times more durable than the other one would have obtained. Thus the chemical composition of a glaze is of great importance in regard to the durability. The different ingredients must be well proportioned in order to attain the best results. A method has been suggested by Prof. Weber of testing low fusing glasses in regard to weather resisting power. He puts a glazed piece of ware under a glass bell jar together with a vessel containing concentrated muriatic acid. The fumes of the acid attacks the glaze, if the latter is lacking in resisting power, quite rapidly and this is shown by the appearance of a permanent film. Of course, whether or not a glaze is to contain lead, depends upon the temperature at which the body vitrifies. An ordinary readily burning, red clay, for instance, which will overburn at a temperature exceeding cone one, could carry only a glaze softened by a large percentage of lead. Although it has often been tried to compound glazes free from lead for lower temperatures, this has in most cases been a failure. Hence, for making glazed brick, to be exposed to the weather, a clay must be used which is sufficiently refractory to carry a leadless glaze, or one containing only a small percentage of the lead, the melting point of the glass to be not lower than cone four.

After having satisfied the conditions of durability of body and glaze the glazed brick must also conform to certain physi-



TERRA COTTA PANEL, N. Y. Herald Building. Executed by Perth Amboy Terra Cotta Co.

cal laws which govern the relation between the clay and the gloss. The main difficulty lies in the different expansion of the substances so widely different in character. It is a generally known fact that all bodies solid, liquid or gaseous, increase



PILASTER CAPITAL, N. Y. Herald Building. Executed by Perth Amboy Terra Cotta Co.

their volume when heated and return to their original volume when cooled. The extent of this expansion varies for different bodies. It is large for gases and liquids and small for solids. The number which gives the numerical value of the expansion of a body referring to its length or volume for an increase in temperature of one degree is called the coefficient of expansion. The coefficient of contraction is, of course, identical with that of expansion. Thus if we take two bars of metal, one of copper and one of cast iron and call their respective length one at say 32 deg. F., then at 33 deg., the copper bar will have expanded .0000097 of the length and the cast iron .0000062. We know now that copper and cast iron have different coefficients of expansion. If we rivet a copper bar onto a cast iron one and heat them a hundred or two hundred degrees, the copper bar, owing to its greater coefficient of expansion, will warp and buckle. Two brittle bodies of different expansions thus fastened together exert a strain one upon the other and eventually the weaker one must break. In uniting clay and glass we have to deal with bodies of different expansions. As long as the temperature is high enough to keep the glaze liquid or viscous it can easily adapt itself to the expansion of the body, but a tension is produced as soon as the layer of glass has become solid. As clay and glass have but little elasticity a tension may result in the breaking or cracking of one or the other. In this manner we may explain two phenomena occurring in connection with glazing, crazing and shivering. If the coefficient of expansion of the glaze is greater than that of the body the tension causes the coating of glass to crack. The greater this difference in expansion and the less elastic the glaze, the closer will be the mesh of cracks or crazes. This crazing may occur already during the cooling or soon after, in which case the mesh is a close one. Or, if the tension is only slight, the slight elasticity of the glaze may counteract the tendency to craze for a while. Often, glazed ware may be stored away for months before crazing shows.

Now, if the expansion and contraction of the body is greater than that of the glaze entirely, different results are produced. Here a tension is produced which has a tendency to crush the glaze. Where the layer of glass is thick, pieces of the body are often splintered off. If there is a strong tension a piece of glazed ware may break with a loud report. These phenomena, due to the greater coefficient of expansion of the body, are

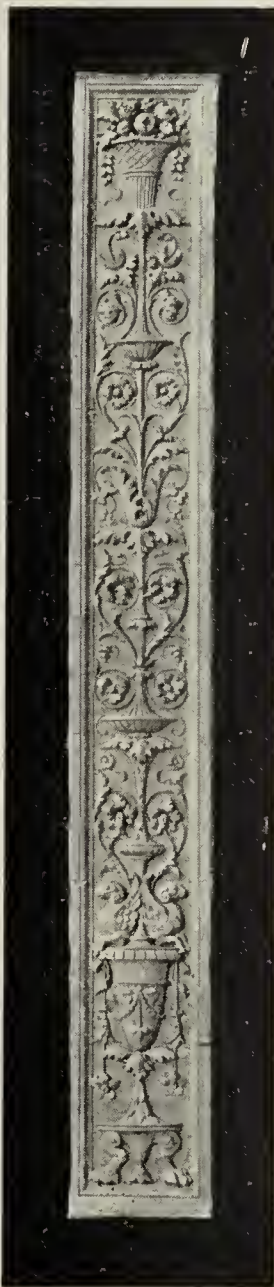
called shivering and are a fruitful source of loss to the manufacturer. Both, crazing and shivering can be remedied by adding or taking silica from the glaze. Notwithstanding all the so-called cures of crazing, the regulation of the expansion of the glaze by adding silica in any form as quartz sand, flint, in the case of crazing, and taking it out of the glaze composition according to the degree of the trouble, in the case of shivering is the most rational method and hardly ever fails. What has been said will, perhaps, show how irrational it is to depend upon glaze recipes which are said to produce a glass free from crazing and shivering. There are no such glazes.

Every glaze must be adapted to the body by experiment, and it is very seldom that a glaze fitting one clay will also fit another one. As a rule, the manufacturer must start from one glaze composition and must keep changing it, for instance increasing or decreasing the silica, until the proper equilibrium between the glass and the clay has been reached.

Not only must the coating of glaze be durable, free from crazing and shivering, but it must also have a clear, clean surface, free from dry blotches, blisters and unevenness. In order that a faultless layer of glaze be obtained it is necessary before all things that the body be homogeneous and free from air blisters. An uneven body which has softer and harder portions, absorbs the slip unevenly. A body full of air blisters, which escape on dipping into the slip gives rise to a glaze full of pin holes. If the body is burned before glazing the degree of burning has much to do with the evenness of the glassy coating. If the body is burned too soft, the slip is absorbed poorly and cracks show immediately on drying, which produce

thick blotches on one portion and dry spots on another. This is explained by the fact that in dipping the air is expelled rapidly. If now the body is too soft the bond between body and glaze may have been loosened. If the body is too hard the slip must be kept very thick in order to give a glaze of the required thickness and this also is liable to give rise to a great deal of trouble. A body which eagerly absorbs the slip is best for glazing purposes and it is better to err on the side of softness, as the hard body is more difficult to work. If the glazing is done on the raw clay the latter must be in that condition between the soft and the dry state which is called by the Germans, leatherhard. Dry clay absorbs the water so rapidly that the surface is softened too much.

Evenness of the glaze coating cannot be had without grinding the ingredients very finely. This is not only necessary in order to obtain a thorough mixture of the substances, but also to render adhesion to the body possible. But there is also such a thing as too much grinding. The finer the glaze is ground the more water it absorbs and the more plastic it becomes. And the more plastic it is the greater a tendency it has to crack, either on drying or in vitrifying. Cracking again causes rolling of the coating so that thick and dry blotches are produced.



Terra Cotta Pilaster, N. Y. Herald Bldg.

If the glaze burn is stopped too soon the small inequalities which are caused by the escape of air bubbles have not yet been smoothed over, thus giving to the glaze an egg shell like surface. The same fault may in some cases be traced to sulphuric acid, which at higher temperatures is being constantly expelled in small bubbles. In order to avoid this trouble the burning must be continued till all the gases that must escape,

have been evolved and the surface has again been smoothed over. In earlier stages of the burn when the evolution of gas is most violent, large bubbles are coming off and if burning is stopped at this point a blistery glaze is obtained.

Having considered some of the physical phenomena playing a part in the making of a glaze we will in the next paper return to the chemical changes which a glass undergoes and the chemical laws influencing the process.

NEW FURNACE FOR THE DRYING OF CLAYS.*

THE METHOD USED in drying clays depends essentially upon the practical use to which it is to be put. Water can be eliminated by direct contact with the flames, in which case the installations are always very simple and their description is not of much interest. But if it is to be dried out of contact with the flames, the apparatus at once becomes complicated as the heat is directly utilized. In all cases it is necessary to dry the clay very carefully to prevent the clay losing its plastic qualities and thus make it useless. Clay which is used for a body in the making of crucibles for use in the manufacture of steel should be dried with much caution. This does not mean slowly alone, but that also a high temperature should be avoided, and that plates brought to a red heat should not be permitted.

It is well known that at high temperatures a rational drying can be obtained by the circulation of air, i. e., that the hot air takes up more water as its temperature rises. This is readily seen by a glance at the following table, which indicates the quantity of water in grammes contained in a cubic metre of saturated air at various temperatures:

| | | | | | |
|-----------------------------------|------|------|------|-------|-------|
| Temperatures, Fahrenheit..... | 68° | 86° | 122° | 158° | 212° |
| Water vapor in ounces avoird. per | | | | | |
| 1,000 cubic feet of air..... | 17.1 | 30.1 | 82.3 | 195.3 | 589.5 |
| 60 per cent. of ditto..... | 10.2 | 18.1 | 49.4 | 117.3 | 354.0 |

The drying air rarely is saturated, and it is assumed that it will contain but 60 per cent. as much moisture as is required for saturation.

It follows from these figures that a cubic foot of air at 212° Fahr. can contain a weight of vapor equal to 34.47 times that contained in the same air at 68° Fahr.

The quantity of heat absorbed varies also with the temperature. It is easy to calculate in the following table the quantities of heat, starting at 32° Fahr., in a kilogram of water vapor at various temperatures, this vapor of water being mixed with the air so as to saturate it. The air contains a number of calories corresponding to the weight entering into the mixture at the temperature given:

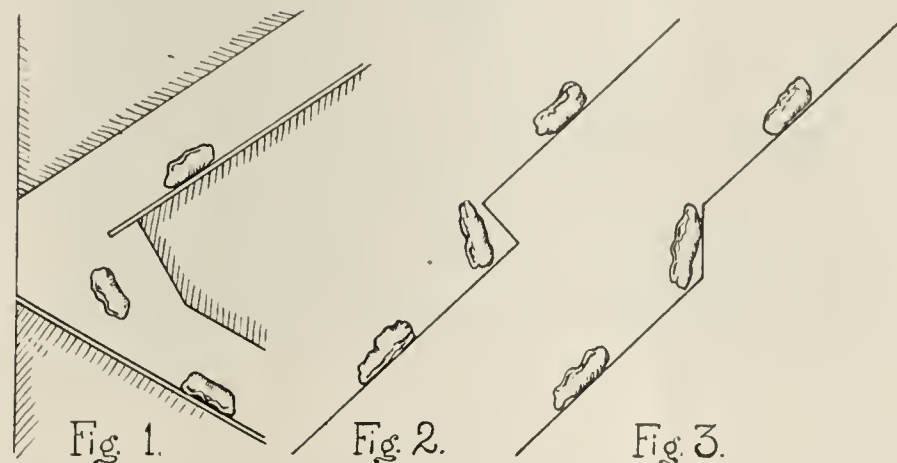
| Temperature. | Quantity of heat calories contained in | | |
|----------------|--|------|-----------------------|
| | H ₂ O vapor. | Air. | Water vapor plus air. |
| 68° Fahr..... | .613 | 324 | 937 |
| 86° Fahr..... | .616 | 265 | 881 |
| 122° Fahr..... | .622 | 139 | 761 |
| 158° Fahr..... | .628 | 60 | 688 |
| 212° Fahr..... | .637 | 0 | 637 |

We see that the greater part of the heat is used to vaporize the water, and that the quantity of heat required to bring the moist air to any given temperature is smaller as the temperature is higher. Thus, at 212° Fahr. the heat necessary is 70 per cent. of that required at 68°. We can hence realize a considerable economy by using dry air at a high temperature for drying.

The other conditions necessary for a rational process of drying are easily found. Circulation of hot air should be as rapid as possible; hence the space in which it circulates should have a roof as low as possible. This applies only in the case where the air is brought in at a high velocity and comes in direct contact with the clay. On the other hand, the floor should be heated, producing an ascending current of air through the clay, which facilitates evaporation. Finally, the clay itself should be kept in constant motion, and in order that

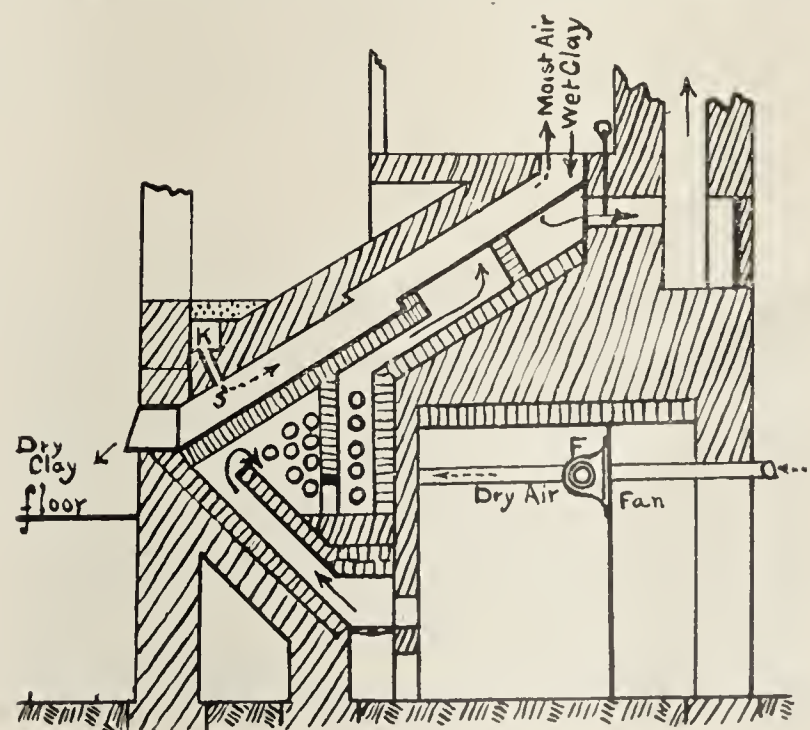
the drying should be methodic this movement should be in the direction contrary to that pursued by the air.

Ordinarily, the drying of clay is done in simple dryers, consisting of a large space which is sufficiently high to permit circulation. This great height is an inconvenience, but not the only one. The clay is placed on drying floors and drawn out by hand—a very laborious operation. Moreover, the heat-



ing is not continuous, and the kiln is allowed to cool after each operation of drying, involving a loss of labor and time, and consequently requires a larger plant for the same quantity of dried clay. In order to avoid these various objections to the usual mode of drying, Mr. F. Toldt, after a number of practical tests, built a clay dryer which is thus described by the *Oesterreichische Zeitschrift für Berg und Huttenwesen*:

Mr. Toldt was struck at once with the advantages of inclined floors. Clay slides naturally on an incline of sufficient pitch, and one can thus effect the turning of the clay automatically. As there is no hand-stirring, the roof can be reduced, which has a decided advantage. In consequence of this movement some of the clay falls to pieces, making the final pulverizing easy. Continuous heating is also an advantage of marked economy. He made some tests at first with wooden surfaces, in order to see how well inclined planes would stir the clay. In the first experiment (Fig. 3) the surface was furnished with a step having the riser vertical, but experiment showed that the particles of clay continued their passage of clay on the second half without being turned over. The second test (Fig. 2), on the contrary, in which the riser was perpendicular to the sliding inclined surfaces, gave a satisfactory result. A sliding surface formed by returning plates (Fig. 1)



The Toldt Clay Dryer.

was also quite satisfactory, but the floor plates were more difficult to heat.

The first furnace made contained so much iron that its cost was very high. To obviate this Mr. Toldt devised another

*Translated for the Clay-Worker from *L'Genie Civil*.

type, which we illustrate in section. The air circulation is obtained by means of a small ventilating fan, which pushes the air through the recuperator tubes, seen in Section 1, placed in the path of the gases of combustion, and thence through a flue K and the ports S into the clay chamber. The lower plate is on masonry, while the upper floor is heated by the gases of combustion, the latter being so far from the fireplace that there is no danger of its becoming red-hot. In this type of furnace the floor is better heated than when resting on brick work. Another modification has the clay floor empty into a closed pit, which can store a considerable quantity of clay. The flue K is better placed, just under the eaves of the discharging end of the floor; otherwise the construction is the same.

Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 1.

Printed Designs Relating to America, by an Old English Potters.

—Liverpool Ware.—

THE EARLIEST POTTERY with printed designs of American subjects was made at Liverpool, England, toward the latter part of the last, or more properly, the eighteenth century. The art of transfer printing on earthenware had been practiced,

to a limited extent, for about forty years before the English potters turned their attention to the American market. The credit of the invention of this style of decoration has been claimed by both Worcester and Liverpool, but the weight of the evidence at our command seems to be in favor of the latter place, where, it is said, copperplate printing on both pottery and porcelain was commenced as early as 1752, by John Sadler, who is, therefore, claimed to be the originator of the process.

Liverpool ware of this character is distinguished by its cream-colored body and its black prints of copperplate engravings, usually under the glaze, or frequently covered with a gloss which gives them the appearance of having been applied beneath the glaze. Occasionally these prints were retouched by hand with color, but the majority of pieces which have come down to us are printed in black, an occasional one being found in green.

The different shapes of articles of Liverpool manufacture so decorated were limited in number, among which we find three characteristic forms which largely predominated. These were pitchers (more properly called jugs), bowls and mugs. Plates, teapots and an occasional piece of some other pattern sometimes turn up, but these have not been found in sufficient number to claim special attention.

The Liverpool pitchers are mainly of one form, or a modification of the same,—a tall, gracefully-curving body with sharp, pointed lip, whose upper line is a continuation of the horizontal line of the rim; the handle is a plain oval, starting on a level with the top of the body and terminating about the centre of the side. This form, while light and graceful, is simple in the extreme, without any relief ornamentation whatever, presenting a perfectly plain surface admirably suited for decoration. Such was the typical pitcher made in Liverpool late in the last century and early in this, and to it may properly be applied the term "Colonial."

The Liverpool bowls were also plain and simple in outline and differed only in size, the dimensions always suggesting the uses to which they were put, the smaller examples having been used, doubtless, for porridge bowls and the larger for punch bowls. Occasionally we find an enormous bowl with its accom-

panying jug of proportionate size, suggesting the possibility of their having served the purpose of toilet utensils.

The mugs were stiffly cylindrical in form and usually about six inches in height, evidently intended as receptacles for ale or other beverages.

The decorative subjects which appear on Liverpool cream ware are varied in character. Many pieces were ornamented with ships and maritime emblems and were brought to this country in large numbers by returning seamen. Frequently ship-owners ordered from the Liverpool potters pieces bearing views of their own vessels. A pitcher of this character shows an engraving of the ship *Astrea* of Wiscasset, and it has been discovered that this vessel was built at that place in 1793 by Gen. Abiel Wood, one of the largest ship-owners at that time in New England. Her burthen was 458 tons, and Alexander Askins was her first master. In 1802 she was lost at sea, and, singularly enough, the pitcher which was made for her is now in the possession of a collector of old china in England.

Biblical designs were sometimes used as decorative subjects



LIVERPOOL JUG, with design of St. John and the Nativity.

by the early Liverpool potters. On a pair of tiles in the Mayer Museum of that city "The Woman of Samaria," and "David and Goliath," are represented. In the same exhibit will be found a teapot bearing a portrait of Rev. John Wesley on one side and on the opposite a representative of the Repentance of St. Peter and the Good Samaritan, accompanied by the inscription, "Let your conversation be as becometh the Gospel of Christ." This interesting example is signed by Guy Green, at one time a partner of John Sadler. In the collection of the late Dr. Irving W. Lyon, of Hartford, Connecticut, is a seven-inch Liverpool creamware jug which bears on each side a large oval medallion, one representing St. John and the other the Nativity.

Numerous other Scriptural designs have been found on old Liverpool pottery, but it is not within the scope of this paper to review them. Masonic devices were employed to a greater extent, on pieces made principally for the use of lodges, though frequently bearing the initials of individual owners. It seems to have been a widely-distributed custom of that day to order Masonic china both for public and private use, if we may judge by the great number and variety of pieces bearing fraternal

emblems, many of them now obsolete. Water jugs, punch bowls and ale mugs of this character were made in great profusion, and many of them found their way to this country. One of the most elaborate of these Masonic designs occurs on a mug, accompanied by the inscription:

"The Mysteries which here are Shown
Are only to a Mason Known."

It would be safe to add that some of these symbols are not even recognizable by Masons of the present day.

We occasionally find on Liverpool ware made after 1800, caricatures which possess a political significance. Printed cartoons of this nature were used extensively in England, and some of them relate to public affairs in this country. Napoleon seems to have been the common butt of the English potters, and in many instances he is represented in connection with American statesmen and incidents in our national history. There is a jug in the Mayer Museum which bears on one side



A MASONIC MUG, of Liverpool Ware.

the figure of a ship flying the American flag. On the reverse is a print showing Napoleon I. in the act of placing one foot on Germany in the chart of Europe and with indecision holding the other foot in readiness to place elsewhere. John Bull, who stands before him, is represented as saying, "I ax pardon, Master Boney, but as we say paws of Pompey, we keep this little spot to ourselves. You must not dance here, Master Boney." From the mouth of Napoleon are issuing the following words: "Ah, you tam John Bull, you have spoil my dance; you have ruin all my projets,"

A milk jug of the same period bears a black print which was evidently suggested by a cartoon published by the Federalists in this country during the "Long Embargo" of 1807-1809. In this design, John Bull is represented holding the horns of a cow,—symbolical of the United States. Bonaparte pulls at her tail and Jefferson is shown in the act of milking her.

The collector and classifier of Liverpool pieces is met with a difficulty at the outset, which makes it well nigh impossible to prepare a complete list of the different varieties. The copperplate engravers who were employed at the establishments

where this ware was produced prepared a great variety of decorative designs, which were afterwards used indiscriminately by the transfer printers, to fill in blank spaces on the cream-



LIVERPOOL BOWL, with Fur Cap Portrait of Benj. Franklin.

colored body of the china. Thus we find various subjects used in all manner of combinations. Two pieces, similar in form and bearing on one side the same device, will frequently be found to differ on the other side, and this is especially true of pitchers and bowls. To attempt to gather together examples of all the combinations would seem to be a hopeless undertaking. To illustrate this peculiarity in the decoration of Liverpool pottery, we will describe three bowls of equal size and similar form, all bearing on one side the same engraved bust of Franklin with fur cap and inscribed, "Benj. Franklin, L. L. D., F. R. S., Born at Boston in New England, 17 Jan., 1706." On the reverse is a profile bust of Washington and the inscription, "His Excellency, General Washington, Commander in Chief of the Forces of the United States of America & President of the Congress." So far the three pieces are similar in design, but the devices which occur in the interior are all different. One of these, which is now before me, has a central design of a frigate flying the United States flag, containing fifteen stars. The second bowl bears in the bottom a representation of the capture of a French vessel by one of the American frigates, probably intended to represent the "Constitution." The third example, which is in the possession of Mr. W. F. Sheely, of New Oxford, Pa., is decorated in the interior with a portrait of Commodore Preble, who commanded the same vessel in 1803. The spaces between the portraits of Washington and Franklin, on the outer sides of these three examples, are also ornamented with different devices,—shepherds and shepherdesses, Neptune with his sea-horses, groups of surveying instruments and other emblems which bear no relation to the main subjects.

One of the most familiar designs which is found on cream



A LIVERPOOL BOWL, with Portrait of General Washington.

ware pitchers shows the portraits of Samuel Adams and John Hancock, placed side by side, and around the medallion is printed the following inscription:

"The Memory of Washington and the Proscribed Patriots

of America. Liberty, Virtue, Peace, Justice and Equity to All Mankind." Below occurs the couplet:

"Columbia's Sons Inspir'd by Freedom's Flame,
Live in the Annals of Immortal Fame."

On the upper part of the device is a weeping willow, and a



PORTRAIT OF COMMODORE PREBLE, from the interior of a Liverpool Bowl.

monument which contains the words: "Sacred to the Memory of G. Washington, who emancipated America from Slavery and founded a Republic upon such just and equitable principles that it will — — —." These were strange sentiments coming from English manufacturers at this time, but the spirit of trade was strong in their breasts and they were all things to all men when their own pockets were concerned.

The most interesting of these jugs are those which relate to Washington and these were produced in great variety. As these were the most characteristic, they have come to be known as Washington pitchers. Among the rarest and most highly prized is the one bearing the head from Stuart's celebrated portrait. Next to this in popularity is the "Apotheosis" design, copied from a well-known engraving which appeared at the beginning of the present century, soon after Washington's death. About the same time appeared a number of designs of a memorial character, among them a pitcher embellished with a printed medallion showing a monument supported by Fame on the right and a clergyman and naval officer on the left. In the background are a ship and a church steeple, while on the center of the shaft is a bust of the departed and on either side the words, "First in War, First in Peace," "First in Fame, First in Virtue," and on the sides of the stone above, the inscription: "Born 1732," "Died 1799." Around the border of the oval design are the names of thirteen States, all of the original except Rhode Island, for which "Kentuckey" is substituted. The spelling of Pennsylvania with one n is an instance of the prevailing ignorance of the average English potter of that period concerning American affairs. The pitcher which is here shown is in the possession of Charles H. Pennypacker, Esq., of West Chester, Pa.

Among the rarer pieces which came from Liverpool are such as bear the names of the States, occasionally including "Boston" and "Tennessee." A rare mug, owned by a prominent American collector, shows a chain of eleven links, each containing the name of a State, and many examples are known which bear the names of fifteen, including Vermont and Kentucky.

Liverpool ware does not appear to have been produced for the United States market until after the close of the Revolu-

tion, but the events of that war continued to furnish decorative subjects to the English potters for at least a quarter of a century afterward. It must not be supposed, however, that all of the cream-colored ware with black prints originated in Liverpool. Similar ware was made at other places in England, but for want of a better name it is all known at the present time as Liverpool ware.

It is not the purpose of this paper to present a list of known Liverpool designs relating to America. Our object is merely to give a general idea of this earlier class of pottery, preparatory to taking up the Staffordshire productions of a somewhat later date. EDWIN ATLEE BARBER.

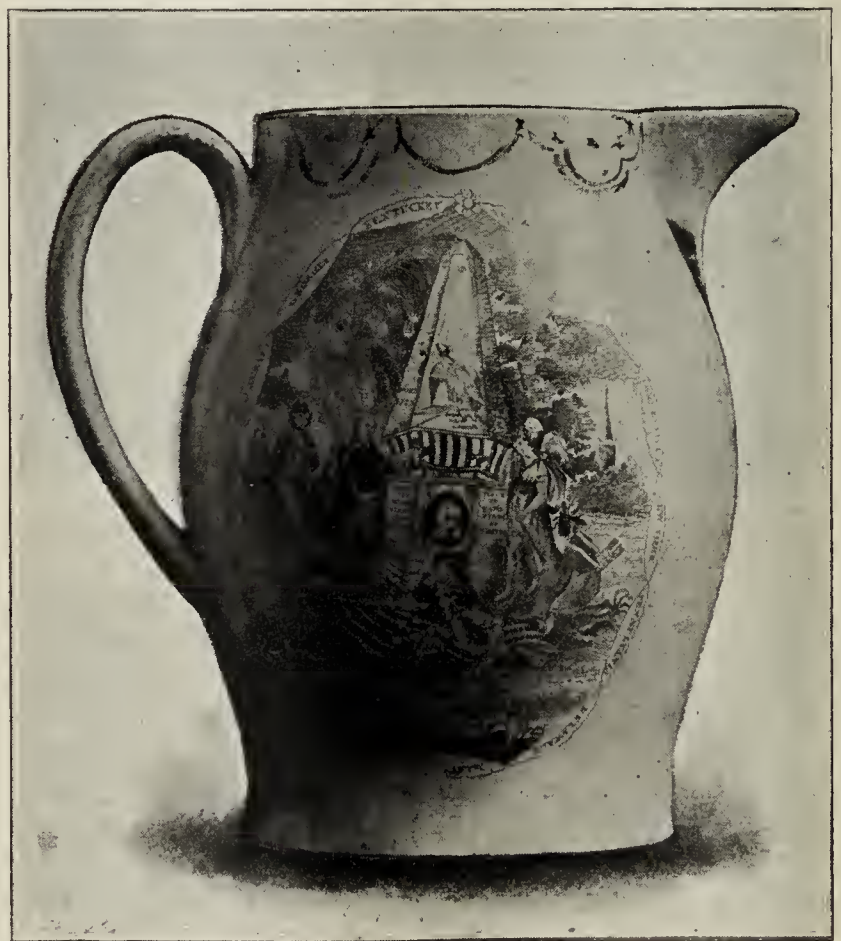
A VERY BAD HABIT.

How is business? Is there any way to improve it, or have you exhausted all your resources?

There are times when the pulse of trade seems to stand still—when all efforts to improve the business seem of no avail; then, I will admit, there is just cause for complaint. But I have in mind a country merchant who complains without cause—he is a chronic complainer.

When I first met this gentleman, some seven or eight years ago, times were good; money was plentiful; customers could be depended upon to buy about the same amount of goods every month. But things changed. You remember when business got dull. It was then my friend commenced to complain and he has kept it up ever since. He stopped advertising; really I thought he would quit doing business. I have now come to the conclusion that he remains in business so that he can have an excuse to complain. His business is poor and he will not allow it to improve. He discourages all public enterprise and is a detriment to his town.

I feel that such a man should be forced out of business. I



A WASHINGTON PITCHER, of Liverpool Ware.

believe that complaining is a disease—contagious, too—and when a man gets it he neglects his business and causes discontent among his associates. When business begins to lag and a man has not the force and energy to get it back into its normal course and push it ahead, I think he should get out and give someone else a chance.—Ad. Sense.



A NEW \$2,000,000 MINT.

THE PROPOSED new mint of this city at Spring Garden street and Fifteenth will prove quite a sinking place for brick. Looking over the lines last Monday, I found the excavations already covered with the basement walls and foundations. All the bearing walls are four feet thick, and as the lines of the building run 314 feet by 200 and only four stories high, it looks as though the federal government was going to have a pretty good job. All the foundation walls are of hard red stretcher brick and already this has soaked up some 3,000,000. When I inquired of the superintendent as to who was lucky enough to get the contract, he told me Sam Huhn, out at Thirty-sixth and Dickinson streets. The contract price for Uncle Sam's new wealth-producing station is a level two million dollars, and some of our Philadelphia men must hustle now and try and get a snap shot on the next estimate, which will call for two and a half million to three million stretchers for the superstructure and about 100,000 enamel brick for the interior, contracts to be given out on the 15th day of May next. So, boys, jump for it; they'll have to go in cheap, but they'll go in all of a lump, and your money is a dead sure thing.

Turning my trotter cases southward, I resolved to go down towards the Neck and see what the yards were doing; it only meant a little walk of about 150 squares. The yards weren't in it compared with the weather, which changed forty times in fifty minutes. The previous day it had snowed and thawed and the yards were in that slippery, clammy and sticky condition which calls either for a boat or hip boots.

Slipping and sliding into the Philadelphia Brick Co.'s yard at Twenty-fifth and Dickinson streets, run by the veterans Wm. R. Chapman and James H. Hamilton, I came across the chief bookkeeper in a very optimistic mood. The last year they had gotten out and sold about thirteen million and kept going right up to February, when they shut down for inspection; this taking up about three weeks, will allow them to start up again in the middle of this month. They placed with the Stephen Gerard office building, at Twelfth and Gerard streets, two million; at the dormitories of the University of Pennsylvania, three million; at the S. S. White Dental Co.'s building, Twelfth, below Walnut, one million, and about 50,000 for the Physicians' and Dentists' building, Seventeenth and Chestnut, and for this year they start in with a fair volume of business. Having closed a contract for the new office building of the Real Estate and Trust Co.'s seventeen-story sky-scraper, they will proceed to deliver two million at their earliest, furnish the brick for ninety-six houses to be erected in West Philadelphia, drop one hundred thousand at Broad and Callowhill, and for the sewers in the northern section of the city eight hundred and fifty thousand, and then turn round and say the brick business is no good.

—The McAvoy's.—

Frank was sitting in his arm-chair as I entered that trim little office with about four brick-weight of clay hanging to my russets, extended the hand—the McAvoy hand, you've seen it, I guess—it's a good one, friendly in its grip, and firm. He told

me they worked from April to November last year and got out about 8,000,000 with the aid of sixty-five men. He also told me that poor Lou Jarden was dead; died last Sunday. He was the elder son of the well-known Jacob Jarden, who accumulated quite a pile and retired in time to enjoy it quietly out at Glen Mills, where he celebrated his golden wedding, and I, as a guest, enjoyed the social pleasures that afternoon and evening. Louis succeeded his father and carried on the business until about '90 or '91, when he was bought out by a stock company, and henceforth it was known as the L. E. Jarden Co. They control the trade mostly in and around the city, being about the only company here which turns out the mottled or Pompeiian brick. Mr. Frank McAvoy very kindly offered to drive me back to the city, but I had to politely decline, as I was going to slide over the clay banks to Samuel Huhn's, and I did it; don't ask me how. I am still busy trying to scrape the mud off my pants and russets. Maybe I'll pant and cuss it before I get through.

The foreman in the office and the yard as still as a grave was all I found, for Mr. Samuel Huhn "had went at 12 o'clock," and I would have to come again.

Slowly turning my nose towards the north, I could see about four hundred yards in the distance Frank McAvoy's comfortable buggy going along at a 2:50 gait—he was inside, I was out.

MITSCHKA.

GERMAN NOTES.

—Artificial Hardening of a Gravel Bottom.—

IN BUILDING a bridge at Ehinger, the foundation for one of the two piers was rock, while the other one came to be located upon loose gravel carrying much water. In order to use this bottom as a foundation, iron pipes, one and five-eighths inches diameter, were sunk down into the gravel and cement water was pumped through them. Gradually the pipes were withdrawn till finally the entire gravel bottom had solidified into concrete. This method considerably decreases the cost of building foundations upon a loose bottom.

Thinking it might interest our readers to know what subjects are being discussed by the German craftsmen, we give in the following the programmes of their societies, which convened in February.

Meeting of the German Brick and Lime Manufacturers' Association, February 17th, 18th and 19th:

"Are there any slumming machines which completely remove the residue, sand, etc.?"

"Ornamentation of auger machine brick, a new method of decoration resulting in cheap and richly-ornamented brick fronts."

"Who has had experience with disintegrators for very fine grinding?"

"How fine can clay be ground in a dry pan, and what is the capacity for different grades of fineness?"

"Has the horizontal ball mill with automatic sieving arrangement proven a success for grinding clay, and what is the capacity?"

"Have other new machines than these appeared on the market?"

"Has any one had practical experience with the grinding of limy clay, in place of slumming it?"

"What new development has been experienced in dry pressing during the last year?"

"How can the importation of Swedish pavers be counteracted?"

"A new shape of front brick."

"A new shape of roofing tile."

"Improvement in tramways."

"How can measures be taken to have applications for patents state the scope of the respective patents?"

"Which is the best kiln for burning 5,000,000 fine front brick per year?"

"Aims and success of the German Clayworkers' Association."

"Have fans been used to increase the draft in stacks of the continuous-kiln, and how are the fans arranged?"

"How high can clay be heated without impairing its plasticity?"

"Has the Cummer dryer proven a success for clay from the bank, and what is its capacity?"

"What experience has been had with the drying of brick in the Cummer dryer, and what is the cost of drying per thousand?"

Convention of the Brick, Lime, Clayware and Cement Manufacturers' Association, February 21st to 24th:

"The utilization of water power for generating electric power, transmission and distributing of same."

"Exhibition of a map of the province of Brandenburg, showing all the brickyards."

"What points are determinative in prospecting for clay and ore beds."—Dr. Kiebelkorn.

"Have there been any new experiences in drying brick and raw material?"

"Reports from returned question-blanks bearing upon the consumption of fuel in burning brick and other clay wares."

"What system of test-kiln has proven best, and how to build a test-kiln for burning color-tests in small quantities as rapidly as possible."

"What experience has been had with coal-dust firing for burning brick kilns?"

"Leaving single compartments out of the circuit of continuous kilns."

"Fire-proof ceiling construction."

"Are corrugated iron roofs to be recommended for kilns?"

"The most important patents bearing upon the brick industry granted during the past year."

"The latest experience with an automatic brick car and the use of drying system connected with it."

"An important novelty in brick cars."

"Description of a new roofing tile."

INSPECTION WAIVES DEFECTS—OF INTEREST TO BRICK CONTRACTORS.

A CONTRACT FOR DOING the stone and brick work of a brick barn provided, among other things, that the party taking the contract would make "a complete and workmanlike job, according to the drawing and spirit of the specifications, to the entire satisfaction of the proprietor and architect, who will have full power to reject all work and materials not the best of the kind specified, and, should such materials or labor be introduced, it must be removed and replaced, entirely at the contractor's expense." It also provided that "the whole of the work is to be inspected as it goes on, and accepted by the owner and architect before a final settlement is made." In construing this contract, the Supreme Court of Wisconsin holds, in the recent case of Laycock against Moon, 72 Northwestern Reporter, 372, that the contractor was bound to complete his job to the "entire satisfaction" of the owner and his architect, while the latter were reciprocally bound to make inspection of the work and materials, as the work progressed. They had the power to accept or reject work or materials, and to require unsatisfactory work to be done in a satisfactory manner, and unsatisfactory materials to be removed, and their places supplied with other materials, such as should be in conformity with the contract and satisfactory. This, the court further adjudges, all clearly implies that the work and materials were to be accepted or rejected at the time of such inspection and during the progress of the work. Here was a prudent precaution against the surprise of a suppressed dissatisfaction at the end of the work. There was, in effect, an affirmative stipulation by the owner and his architect to accept or reject, as the work progressed, such as should be deemed not conformable with the contract and unsatisfactory. Failure to express dissatisfaction as the work progressed, the court insists, might fairly be interpreted as acceptance, and such acceptance must be deemed final and irrevocable. If the owner failed at times to inspect the work, he must be bound, notwithstanding it may have been to his loss, by the acquiescence of the architect who represented him. And such matters as the pointing, cleaning and staining of the walls, which were contracted for, the court holds might be waived by the owner, and, it thinks, were waived in this case, or were at least disposed of by a verdict of the jury in favor of the contractor, judgment on which is affirmed.

MILWAUKEE BRICKMAKERS SEE LIGHT AHEAD.

A MEETING HAS just been held by the local manufacturers of brick by which it was decided to raise the price from \$5.25 to \$6.50 a thousand. At the same time the price of lime was also raised in this city from sixty to eighty cents a barrel. The increase in the price of brick was made easier by the action of the Chicago brick men in advancing their product to \$6.50.

It has been expected all along that the price of Milwaukee brick would go up in the spring, but it was really only due to a reorganization of the brick men that the advance was possible, and this reorganization was effected a few months ago, after a year of demoralizing competition between the local yards, principally carried on by two South Side firms. This state of things had succeeded the dissolution of the old Milwaukee Building Material Company, and the reorganization, effected with some difficulty, has rolled a burden from the minds of the brick men that threatened to ruin the majority of them.

The result of the competition was that common brick went down to \$4 a thousand, while the price of wood and labor remained the same as it had been, and there was mighty little consolation in the fact that coal had become a shade cheaper. This deplorable state of affairs continued for months and months and threatened to become even worse unless a combination of the local manufacturers could be brought about. The Milwaukee Building Material Company had been formed in October, 1895, to hold prices up to the point where the local yards could be operated at a profit. Finally the company became a name merely. It did not officially die, but it might as well have done so, so far as its value to the members was concerned when the price-cutting war began. Its efforts were directed to closing up old accounts, and brick continued to sell at \$4, with most of the yards closed up, and the others doing business in a half-hearted way and waiting "for something to turn up."

What really started the price war was an effort on the part of some of the yards to block the way of the Chicago manufacturers. In fact, there had been no chance of the Milwaukee people maintaining prices in view of the Chicago competition. Once prices began to be cut to head off the Chicago people, a strife began between local yards, and finally the Chase Brick Company and the Standard Brick Company, both of the South Side, became the principal fighters. Under such conditions the forcing down of the price was inevitable.

When the Milwaukee Building Material Company was formed in 1895 common brick was selling for \$7, and that price continued in force well into the spring of the succeeding year. The Chicago brickmakers, with the help of discriminations in railroad freights, began to fill the market with inside brick of an inferior quality, and because of the cheapness of the product soon got control of the market. Then common Milwaukee went down to \$6.50 and then to \$5.25. In their efforts to keep out the Chicago product, the Milwaukee men refused to sell brick for facing the Chicago brick, and this forced the contractors to get their facing brick in Jefferson, Wis., the price being apparently the same, \$6.25, but without certain discounts which the Milwaukeeans had been giving. The price of the Milwaukee pressed brick, during the war, went down to \$5.50. It had formerly been \$9. The part that freight discriminations played in the brick war here is interesting and significant. It seemed wanton in its heedlessness for the local interests. If a Milwaukee manufacturer wished to send brick to North Milwaukee, a distance of less than six miles, he had to pay eighty cents a thousand. A Chicagoan could send brick there, a distance of over ninety miles, for sixty cents a thousand. The Chicago people had been able to get such a rate by making yearly contracts with the roads. It was therefore no wonder that the Milwaukee people were practically tied up in their own territory.

Chicago brick is now coming to the city in smaller quantities, and while the price of the local article is not up to its former mark, the manufacturers feel naturally pleased over the state of things.

F. F. HEATH.

Written for the CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN.

SUCH AN ENVIRONMENT for a brickyard as indicated in the above caption is nothing new in our Western country. Most of our towns are of wood, and many of them surrounded by the woods. There are wooden dwellings, wooden barns and wooden outbuildings, all surrounded by wooden fences. Wooden sidewalks lead along the streets from one dwelling to another, and wooden walks up to the front door. And, although our little city boasts of a population of three thousand souls, and has some fine business blocks of brick, still there are many old relics of former times of wooden store-houses, hotels, churches and barns. We have six church houses, all of wood but one. And as if this were not enough for the poor brickmaker to bear, even the very foundations of nine-tenths of these houses are of wooden posts; and all this in face of the fact that good, hard brick can be bought any day for five dollars per thousand.

This is a discouraging picture, but not overdrawn. The problem of market in such a town is a knotty one. We have not only to make good brick, and make them cheap, but we have also to carry on a campaign of education that requires almost as much care as the factory. Men must be made to see that brick structures are far superior to wooden ones, and also cheaper in the long run. We have often made bids upon dwellings as cheap as the lowest bids by the carpenter, and have been told by the builder that he preferred a frame house to a brick one at the same price; that brick walls are damp; that in a few years brick structures go to rack, settle out of shape, and get unsafe as residences. Besides, the old-fashioned brick house is too plain to suit the tastes of our people, and we have no modern ones to show what can be done with brick to produce a beautiful effect. Brick foundations cost too much these hard times; besides, white oak posts last a long time, and new posts can soon be put in when the old ones rot out.

So they go on building their wooden houses on wooden posts, and when they settle out of level next spring, the doors are planed off at one corner to allow them to open and shut, and strips of wood nailed on at the opposite corner to fill out where the door misses its frame. The windows undergo a similar overhauling annually, while the eave troughs often get to running the water from instead of toward the cistern.

Our trade is a local one, for our one railroad is short in length but long on rates, so that our shipping trade amounts to but a trifle, and the profits of a shipment after paying freight are small indeed.

It might be interesting, at the beginning of this short series of articles, to mention the various purposes and uses of brick on our market, and how we manage to dispose of enough brick in such a territory to make the business profitable. In the first place, stone does not enter into competition with our material because of the long distance to any quarry, so that nearly all of our masonry here has to be of brick. Gradually our old wooden business structures are being burned or torn down and brick ones going up instead. This is a country of big cisterns and cyclone cellars, and our sales for these two purposes alone amount to a half million bricks annually. Then there is a demand for sidewalks and street crossings. We have never yet dreamed of street paving. Most of these demands are for a hard, well-burned brick. It is almost impossible to dispose of a pale brick, and great care is required that the per cent. of pale brick be as small as possible.

This series of articles, then, will be a short history of a small factory, supplying only a local demand, and keeping within the bounds that must necessarily circumscribe so small a concern. We read with considerable interest of the fine equipments of many of our brethren in the craft, and of the ten, twenty and forty millions made annually at one plant. We admire their enterprise, but we do not aspire to emulate them. We have only a small niche in this world to fill, and even should we make ten millions in the year 1898, we would be obliged to shut down our works perhaps for the next ten years in order to dispose of the stock on hands. Then we might be tempted to emulate some of our big brethren by cutting prices and demoralizing trade trying to create a demand where none exists. Better to curtail the output than to overdose the market.

We often dream of artificial dryers, dry presses, continuous kilns and other of the latest improvements, but when we wake

up we go to work again making common side-cut brick, hack them up to dry, run them on wheelbarrows to up-draft kilns, burn them good and hard with wood, and let the man who has the demand for fine material build the costly plant. I shall not attempt to ventilate any untried theories here. Some of my efforts have proven failures; others have turned out to be successes. I have very few, if any, original ideas, but have attempted to adapt other men's ideas to my clay bank. Perhaps my experience may help others who are passing through a series of discouragements similar to what we encountered at the outset of our brickmaking career.

L. C. M.

[To be continued.]

A CHARMING PICTURE.

AMONG the many pleasant reminders of the Pittsburg Convention contained in these pages, none, we opine, will be more pleasing to those who attended the "best Convention yet" than the accompanying picture of Miss Hettie Sibley, the three-year-old daughter of the worthy Treasurer, and her colored "mammy." Miss Hettie is an unusually attractive child, and her innocent prattle and dainty ways were made all the



MISS HETTIE CAMILLE SIBLEY AND HER COLORED "MAMMY."

more charming by contrast with the crowd of grown-up folks about her, and she was always the center of an admiring group. We thank "Master John" for the charming picture, which we are sure will be prized by our readers, particularly those who came under the spell of Miss Hettie's childish charms.

The picture is also of interest in that it shows a typical Southern family servant, now in her ninety-seventh year. She was Miss Hettie's great-grandmother's waiting-maid, and has been in the service of the Sibley family since childhood. In all these years she has ever been faithful to every charge, and, though a slave, refused to leave her "Missus" when freedom was proclaimed. She is still energetic, and persists in taking an active part in the household duties. Miss Hettie is her special pride, and it was with much reluctance that she permitted her to leave home in mid-winter. "I knows," she said, time and again, "it will be too cold for my baby up North." Happy indeed was she when the family returned home, and she again held "baby" in her arms. Such devotion may seem strange to us of the North, but it is not uncommon among the older families of the South.



A NEBRASKA PAVING BRICK PLANT.

GLAD TIDINGS of busier, happier times come from all portions of our land. The Western States are once more on a prosperity basis, and the clayworkers of that section are getting their full share of the increasing business.

One of Nebraska's best plants is that of the Table Rock Vitrified Paving Brick Company, which is operated by Charles H. Heineman, of Falls City, Neb., as lessee, and managed by George F. Cotton, of Table Rock, who is one of the best known and best posted brick men of the State. The plant was erected by Mr. Cotton in 1893, and is well located and well equipped throughout with modern machinery and appliances, having a yearly capacity of 8,000,000 pavers. The past year or two only about one-fourth that quantity has been produced, but under

ranges from fifty to three hundred feet in depth. It vitrifies very easily and makes an excellent grade of pavers. Mr. Cotton figures that they have clay enough to make all the brick needed in the United States.

The clay is taken direct from the bank in wheel scrapers and dumped through a chute into a large dry pan, which reduces it to a powder, when it is elevated to a ten-foot pug mill, where water is added, the mass is tempered, and dropped into a Frey-Sheckler Giant brick machine having a daily capacity of 50,000 end-cut brick. An automatic cutting table is used, from which the brick are trucked to steam-heated dry sheds, exhaust steam being used in the day time and live steam at night. It takes nearly five days to dry the brick thoroughly. From the dryer the brick go to round down-draft kilns, which were designed and patented by Mr. Cotton. They are twenty-two feet in diameter, each having a capacity of 40,000 pavers. There are twelve kilns, arranged in groups of four, each group having a separate stack fifty feet in height. They slow-fire one kiln, and have one hot at the same stack, using Missouri or Iowa nut coal for both kilns and boilers. During the past season they have repressed about one-tenth of their output on hand presses, but the coming season will arrange to repress at least one-half their brick, as there is an increased demand for repressed pavers in that section.

Their pavers find a ready market throughout eastern Nebraska and adjoining States. Brickmakers from the South and East who will attend the Omaha Exposition this summer and



VIEW OF THE TABLE ROCK VITRIFIED PAVING BRICK Co's WORKS, from top of Clay Bank.

the improved conditions of trade they are counting on running up to their full capacity during the ensuing season.

—The Clay Bank.—

They have some fifteen acres of excellent clay that affords an inexhaustible supply of raw material for the manufacture of both building and paving brick. There is a top layer of soil averaging some five feet in depth that is not used for brick-making. Beneath this is a five-foot vein of plastic clay which makes good builders or sidewalk brick. Then comes a stratum of black clay some twelve feet in depth, from which a good grade of pavers is produced. There is next a vein of what is called bell rock, which is about fourteen inches thick, and below this a mass of blue-black clay, which their borings indicate

fall should arrange to stop off one day at Table Rock and visit Mr. Cotton's plant. A cordial welcome awaits all visiting brickmakers, particularly members of the N. B. M. A., of which organization Mr. Cotton is an old-time member.

A VERY PROFITABLE MEETING.

Dear Randall—The Pittsburg meeting was a very profitable one to me, and the pleasant time I had makes me deeply regret that I have ever missed a Convention. The Pittsburg members are to be congratulated on the success of the Convention, and the Clay-Worker, also, for the promptness and accuracy of its report of the proceedings.

ELLIS LOVEJOY.

Union Furnace, O., March 8, 1898.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

“SO YOU ARE the fellow who wrote that Mother Goose button-hole talk with your little girl, are you? I’ve been looking for you since I read that. Began to think I would like to see you. Speaks better for you than anything I know of. Why, those little ones do more to keep the milk of human kindness from curdling and souring than any other one force on the earth. Size don’t count for effect there, sure. Why, those little cherubs keep humanity gentle and kind, and save the Sodom of human life more than any other power or influence under the sun. When a man hasn’t a place in his heart or his arms for them, don’t go near him or trust him. But whatever man does love them you can trust to have something of redemption in his system anyway, no matter how many signals of outward depravity he may exhibit.

“Why, through all the toil and sweat, the worry and fret of my everyday life, I look forward to the joy of meeting my sweet little cherub, with her glad shout of welcome to my home-coming in the evening. How proudly she takes possession of me and leads me towards the big easy chair, in which very probably sturdy brother Johnnie may be already ensconced. How demurely she humors his weakness by suggesting that he occupy that ‘nice chair over by the window’ in a manner that he cannot deny. Then how proudly she seats me back in the cushions, brings my warmed slippers, and then, perched in my lap, commands: “Now play,” whereat we go into boisterous merriment, while her shrieks of happy laughter, rosy cheeks, flashing bright eyes and tangled hair all evidence her happy enjoyment, as she banishes care and trouble and shop from the tired but happy captive for whom these evenings are all too short.

“Then, tired with laughter and with story, when the sand man has made the bright eyes heavy, she insists that none but papa—big, rough, tough papa—shall lead her upstairs, where, robed in the big pink “nightie,” she kneels and, placing her soft cheek against his, so worn and tough, she murmurs that most consistent and at the same time common prayer of childhood, in which he reverently joins and thereby comes nearer the throne than any ten-thousand-dollar preacher could possibly bring him—comes, not as driven, or scourged, or dragged, but reverently and gladly, as a child to the parent—coming with love and gladness, clasped in the warm, loving, childish arms—comes cuddling and loving in the atmosphere of her innocent and confiding affection, with her sweet breath on his cheek and the murmur of her innocent lips in his ear, he is borne along in the “now I lay me” which he lisped in innocence so many years ago to that mother long since gone to her reward.

“Then, when the prayer is said, when the little, warm, clinging arm about his neck slowly unclasps as her regular breathing tells the story of her complete transition to the ‘Land of Nod,’ how he still lingers, basking in the recollection of her love, until finally he takes a parting kiss and drags himself away.

“No wonder that the Savior of mankind, weary and worn, unappreciated and misunderstood, left to these little ones His choicest blessing and said to us, ‘Except ye become as little children.’

“Some men have their treasures in dollars, Gates—some in lands, some in political preferment, some in social distinction; but the man who can bask in the love of one of these little ones, day after day, is greater and happier than any king, and more to be envied than any millionaire. He is richer than them all.”

GATES.

HEROIC TREATMENT.

A Parisian who suspects that the food or drink which he has purchased is adulterated, can have the article analyzed, free of cost, at the municipal laboratory. If impurities are found the city undertakes the prosecution of the tradesman, and after conviction the offender is not only liable to fine and imprisonment, but may be obliged to display in his window a sign reading, “Convicted of Adulteration.” There is room for a similar law in this country.—Exchange.

THE DISINTEGRATION OF CLAY BY FROST.

IT IS A FACT—quite easy to demonstrate experimentally—that water expands in the act of freezing; that is to say, a given volume of ice (say a cubic foot) has more bulk than the water from which it is formed. And yet, strange to say, if “the man in the street” be asked his opinion about the bursting of water pipes in winter, he will, in nine cases out of ten, affirm without hesitation that this bursting is caused by the thawing of the ice in the pipes, and not by the freezing of the water in them. We have known even plumbers who, after having mended many such pipes, insist that the bursting was due to the thaw following a frost. This is absolutely one of the most common of popular delusions.

There are many experiments to prove that water expands in the act of passing into ice. It may be useful to briefly describe one of these, then when you come to the application of the principle to the disintegration of clay, it will be plain sailing. An experiment, which may be termed classical, was performed by Major Williams at Quebec. He took a twelve-inch shell and filled it with water, closing the orifice with a wooden plug. He then exposed it to the open air, the temperature of which was, at the time of the experiment, 18 degrees below zero (Fahr.) The consequence was that when the water froze the plug was driven to a distance of about one hundred yards,



MACHINE ROOM. Table Rock Vitrified Paving Brick Co.

and through the orifice there immediately came an icicle eight inches in length. The bulk of this icicle, of course, represented the amount of expansion. In another case the shell itself was rent, and a sheet of ice came through the crack. This evidently settles the case of the bursting of the water pipes. Indeed, the very fact that ice will float on water shows that water expands in freezing. It may be mentioned, by the way, that all liquids do not behave like water in solidifying; for, while on the one hand we have ice, bismuth and cast iron contracting as they pass into liquids, on the other hand we have mercury, phosphorus, paraffin and spermaceti contracting as they pass into solids.

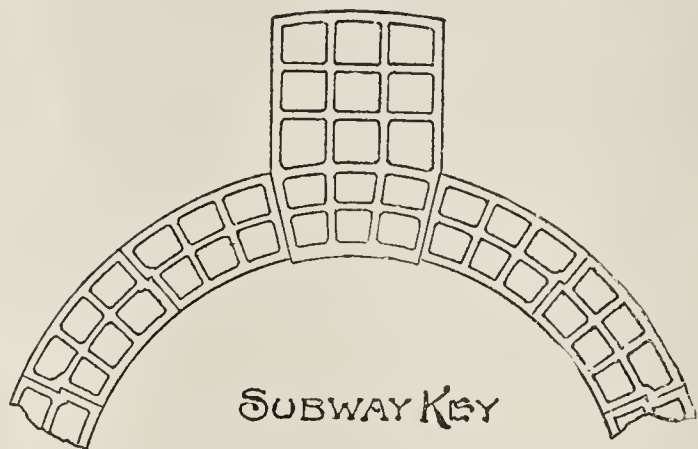
The effect of freezing water on rocks may be seen in quarries, in the weathering of cliffs, and in the production of landslips. If the rocks are not very porous, plenty of water will still find its way through them by means of cracks, and on the freezing and consequent expansion of this water there will be a dislodging of blocks of rocks, sometimes of great size. This disruption of the rock by frost is, of course, of great utility sometimes, and is accordingly taken advantage of by the quarrymen. In very porous rock, however, the tendency of frost is to crumble and disintegrate them. When, for example, a stone full of its “quarry-water” is exposed to intense frost, it will often fall to pieces.

There can be no question that the exposing of the clay to the open air, and its consequent weathering for some months, is of distinct benefit to the clay. Some brickmakers, however, seem to think that it is hardly worth while to let the clay ripen in this way, and accordingly they use it freshly dug, contending that "weathering of clay is of no real benefit to the finished article, but will only lessen the labor and expense of mixing and preparing the clay before use." With this statement we cannot agree at all, for the exposure of the clay to the weather has a two-fold effect, both tending to improve the quality of the clay and thus to benefit "the finished article." The first is a mechanical effect, viz., the disintegration which we have been describing; the second is a chemical effect, viz., the decomposition of certain materials in the clay which may be regarded as impurities. As examples of these, we may cite iron pyrites and limestone. The presence of a certain percentage of these substances in a brick is fatal to its perfect soundness. As to the length of time that clay should be weathered for the manufacture of brick, it is apparent that this will depend on many circumstances, such as the nature of the clay itself, and the weathering influences of the particular country in which that clay happens to be.—British Clay-Worker.

HOLLOW WARE SEWERS—A NEW APPLICATION OF THE HOLLOW BLOCK.

THE CONSTRUCTION OF SEWERS is a matter of deep interest to everyone. The readers of the Clay-Worker will be especially interested in a new method of sewer building proposed by Charles E. Colton, of Syracuse, N. Y., to whom letters patent have been granted for sewers and conduits to be constructed of hollow block or "web tile," as illustrated by the accompanying sketches.

Speaking of the advantages of this system over the methods



now in vogue, Mr. Colton says he is confident that the hollow block sewer will prove both better and cheaper than those built of brick and stone. He sets forth this method of construction in a little circular, as follows:

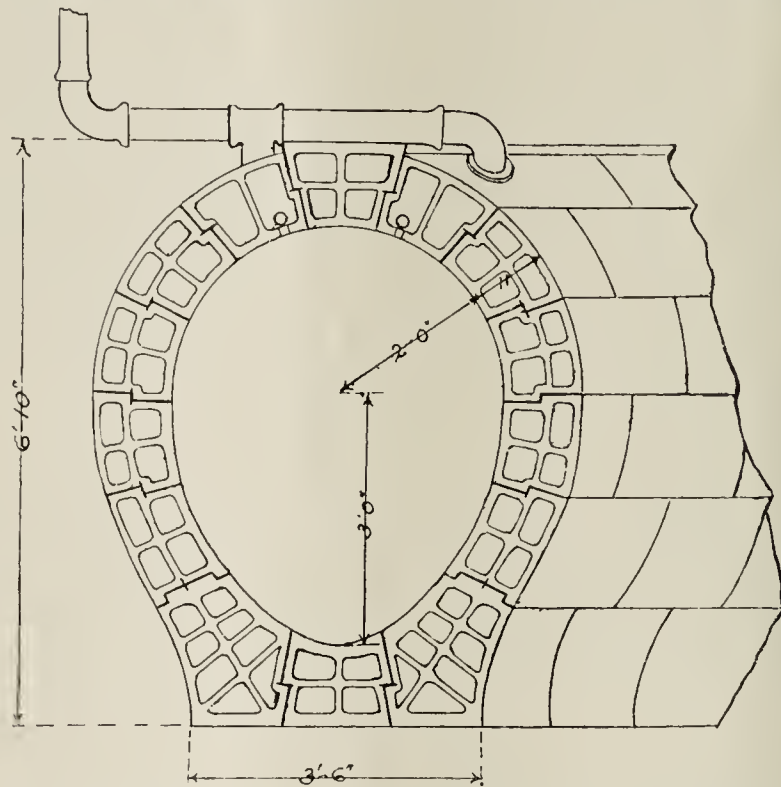
"Modern plumbing has entered into all places of human habitation, increasing tenfold the use of sewers and the necessity that they should be most substantially and sanitarily constructed; and notwithstanding a continual protest from scientific and philanthropic men in every community, the improvement and completeness of sewer construction has not advanced proportionately with the increased use of the same in every city.

"It is in vain to construct any system of sewerage unless the conduits are of a permanent and reliable construction, and as the question of cost always enters into undertakings of this kind, stone conduits have never received favorable consideration on account of their expense, and naturally the common brick sewer has come into general use, which, from the very nature of its material and construction, particularly in the hands of careless constructors, is not a permanent and reliable sewer. Built as they are over stretches of soil of various resisting qualities, the bottom alignment of brick sewers are continually varying, the lower sections settling unevenly, destroying the strength and uniformity of the upper arch, causing the caving in of the roadbed above, and a source of continual expense and annoyance.

"These sewers, with their rough interior surfaces, are also ever ready to catch and hold the more solid filth, which slowly liquidizes and fills the whole interior with deadly gases, se-cretes and collects disease germs, which refuse to move only

when the sewer is flushed, and then sets back into all the lateral sewers, seeking entrance to our living and sleeping rooms, offices and public buildings.

"Believing this to be the condition of every brick sewer in existence, the question arises, how may we remedy the situa-

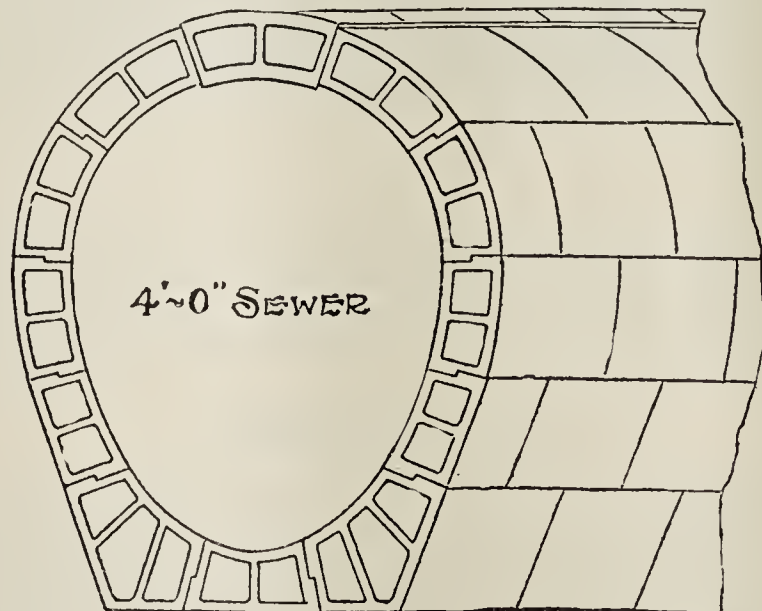


tion? To commence with, it is certain that any rowlock brick sewer built about wooden forms, in a smooth, substantial manner, with an underlying foundation that would keep its alignment, would nearly, if not quite, equal the cost of cut stone in its construction; and there remains the impossibility to move its gases, because of the dampness of its interior, which always impedes a draught or current of air of any kind, as is familiarly demonstrated by the poor draught to be found in the damp chimney flues of buildings.

"To meet the two requirements of a perfect and practical sewer, it is necessary to have a perfectly smooth interior that will not retain any solid waste, of such construction that it will permanently hold its uniformity of grade and resist disintegration; it should have some accompanying feature or device whereby the sewer gases may be forced or drawn out of the conduit to a sufficient height above the ground surface, where they may assimilate with the normal or healthful condition of the atmosphere or subject to perfect flushing. And, finally, it is of great consequence that this new sewer construction, fulfilling all of these requirements, shall compare favorably in cost with the prevailing poor method of sewer building, that the better construction may prevail.

—Flushing Is All-Important.—

"Upon the practical and successful flushing of sewers de-



pends their sanitary success or failure. In times of disease epidemic the sewers of a city become the receptacles and promoters of disease germs; if the sewers have rough and irregular

interior surfaces, exhaustive flushing is impossible, and the construction of an inverted brick arch sewer makes such irregularity inevitable, while the sewer construction shown by the accompanying diagram is made of smooth vitrified ware, the thrusts and loads sustained by a level base distributed equally over an area abundantly large to resist such loads without compression of the soil, assuring a permanent unbroken alignment and entirely smooth interior surface that admits of clean and thorough flushing.

"In this connection it is worthy of note that the web tile construction under the above conditions offers so much less obstruction to the flow of water that a given quantity of sewerage can be carried through the tile sewer in less time than through the brick sewer, making it possible for a tile sewer of less diameter and interior cubic area to dispose of more sewerage in a given time than a brick sewer of like area; this fact, of course, would largely favor the web tile sewer in the consideration of economy.

"The accompanying illustration, sections, etc., represent a sewer construction that will most fully meet all of the above requirements. As will be seen, it is built by the interlocking of sections of hollow tile, strengthened beyond the possibility of collapse by the use of radiating webs.

"A style of construction that has come into general use in all materials like steel I beams, riveted plate girders, terra cotta, etc., when used to support great loads, is the most economical and effective distribution of the material; so that the combination of the web and flange in lintel and arch work, constructed in accordance with formulas familiar to engineers and architects, has made it possible to accurately compute the sizes and shapes of the webs and flanges that will best and most economically sustain the loads. The diagrams shown of the web tile sewer present the factor of strength many times greater than the factor of safety.

"The base of this sewer has a level rest on the soil, the lower section of the interior being an inverted parabola interlocked and covered with a circular arch of the same material. The two upper sections of the tile contiguous to the key section have the intradoes shell perforated with round openings, so that a steam pipe run in this smooth flue will produce a vacuum into which the sewer gases will be drawn, as shown by cut, and find exit through iron pipes carried out at the curb, or up the sides of buildings.

"The different sections of this sewer have locked and broken joints, consisting of tile of considerable size, easily set in cement mortar with the use of a single form, completed with a smooth, regular interior surface that cannot become irregular by settlement or displacement as in the case of an inverted brick arch, and by reason of the economy in the quantity of mortar used, and the less number of pieces to handle, the cost of the labor in constructing this new sewer will be less than the building of the ordinary brick one, which fact alone would recommend the use of the hollow tile for all forms or conduits for sewers and electric or other wires, believing it has superior merit over the imperfect brick and weak single shell tile sewer. The lower sections of this sewer also take care of all trench water, and a special key section can be furnished where subway wiring is desirable."

A company has been organized under the title of the National Web Tile Sewer Company, of Syracuse, N. Y., for the purpose of introducing and constructing the new form of sewer. They have arranged with the Onandaga Vitrified Brick Company, of that city, factory at Warner, N. Y., to manufacture the block, and they will at once equip their plant with special machinery for the production of the tile for sewers of all dimensions from 24 inches to 7 feet in diameter. The Superintendent of the plant, Mr. F. S. Nangle, a well-known member of the N. B. M. A., writes that the dies and other equipment are now being made by Turner, Vaughn & Taylor, and that they expect to begin the manufacture of the block within a few weeks.

A BRICKMAKERS EDUCATION.

An Address by W. D. Richardson, Shawnee, Ohio, before the Ceramic Association of the Ohio State University, February 1, 1898.



WHEN I WAS INVITED to take part in the lecture course of your Association, along with such distinguished clayworkers as Gates, Purinton, Muller and Langenbeck, I was so pleased at the honor that I could not refuse, especially since I am disposed to do anything in my power to promote the interests of the Ceramic Department of this university—the first and only institute in America to recognize the importance of and to provide for the technical education of clayworkers; but as the time has approached when I must fulfill my promise to address you, I have realized that for a busy brickmaker who seldom attends public meetings of any kind and gets little practice in writing or speaking, to dismiss the cares and responsibilities of his business, to lay aside the perplexing problems that confront



W. D. RICHARDSON, Shawnee, Ohio.

him, to free his mind from the affairs of the day and the plans of the morrow that he may devote the evening to preparation for the lecture platform is a task to be dreaded and to be put off till the last hour, and then rushed through with much anxiety and many misgivings; but with the determination to get the burden off his mind as best he may, and to be more careful in the future about making such engagements. Moreover, the man who gets out of bed at 6 in the morning and, after a hurried breakfast, goes upon the brickyard to hustle until 6 at night, will often find after the evening meal and the reading of his daily newspaper that he is more inclined for sleep or recreation than for the labor of composition.

However, I am glad to be with you to-night, to meet the members of your Association, many of whom I know, and to make such effort as I can command to further the objects of your organization, and, perchance, to give some words of encouragement and exhortation that may incite you to make the most of your privileges here, not only for the sake of your

own satisfaction and advancement, but for the welfare also of those who are to follow you in the study and practice of the ceramic arts.

Some years ago, exact date omitted, "for reasons that it may be interesting not to state," on a hot day in August, a young man was tramping over a dusty road which winds its way along the right bank of the Mississippi River, a few miles above the falls of St. Anthony. He was not out for health or recreation, though walking was his favorite exercise, but he was bent upon reaching, as early in the day as possible, a place up the river to which there was no public means of conveyance. He gave little attention to the lands and habitations of the Minnesota farmers along his route, he heeded not the teams that passed to or from the city below, enveloping him in a cloud of dust. He was brooding over the misfortune that had thwarted his ambitions and that must change the whole course of his life; his mind was absorbed in reviewing again the various pursuits that might still be open to him, and in speculating upon the probable effect of the day's journey in determining his future work. Having been forced by a partial loss of his sense of hearing to abandon the profession for which he had been educated, he had for the past three or four years been an unhappy wanderer, hoping against the opinions of the most reputable aurists that he might be cured or relieved of his deafness, yet perceiving it gradually becoming worse and barring him from the only means of earning a living for which his education had fitted him—that of teaching others those prescribed classical branches that he now found were to be of so little use to him in making his way in the world. With no literary ability, he found himself limited to some trade or business of which he had no practical knowledge and for which he had little inclination. Mercantile life being distasteful and not adapted to his condition, he concluded that he must work his way into mining or manufacturing, but how to get started without skill or knowledge or capital, and in what special line—this was, indeed, a perplexing problem, filled with vague longings and many disappointments.

A few months spent in the mountains prospecting for gold at the risk of his scalp from the murderous attacks of Apaches determined him to leave the rough life of the mining regions and enter the more peaceful and less hazardous occupation of the manufacturer. A brief experience in a New York chemical laboratory for commercial analyses and the chance acquaintance of an Englishman who had been engaged in the making of brick created an interest in clay and their products. The whole literature of the subject was eagerly explored, clays were tested, a few brick were made by hand and burned in a stove or in a small kiln, but no opportunity presenting for further work the subject was dropped, but a few months later, in a growing city of the Northwest, was again taken up for investigation. Hence, this young man on the aforementioned August day was making his way on foot to the brickyard at Shingle Creek, about six miles northwest of the city of Minneapolis.

Though twenty-five years of age, he had never been upon a brickyard of any kind, and all he knew about brickmaking he had learned from reading and from conversation with a single individual.

The brickyard was not reached until the middle of the afternoon, when the day's work for making a certain number of thousand brick had been completed, but the process employed was not so complicated but that it could be readily comprehended with the aid of a few questions and the knowledge he had previously gained. A pit was filled with clay in the afternoon and soaked over night; the next morning it was shoveled into a horse-power, soft-mud machine and the molded bricks laid out upon the ground and afterwards edged and hacked, and when dried set in open-top scooped kilns and burned with wood. The product, a cream-colored brick—the harder burned the lighter and cleaner the color—was then a novel sight to a man from the East.

As the other yards were reported to be similar to this one, he directed his steps back to the city, where he arrived at nightfall, dusty and weary of body, but with a mind settled, a purpose formed. He reasoned with himself on that eventful day somewhat as follows: Resign yourself to your deafness, the misfortune came not from man, but from God—resignation is a virtue. What cannot be cured must be endured. Cease striving after that which you cannot attain. In the words of Carlyle, "Say unto all kinds of happiness, I can do without thee—with self-renunciation, life begins." "One thing may as well be done as another," as Sam Patch said when he jumped over Niagara Falls. Why not "go to and make brick" as did the early descendants of Noah on the plains of Shinar, and as his later descendants have continued to do the world over, and will continue to do with increasing ratio for all time? You can learn to make brick and make them well, probably better than those you have seen to-day. The work will be interesting, useful and, perhaps, profitable. No more vacillation—no more waiting for something to do. Be a brickmaker.

The purpose having thus been formed, the opportunity of

making a start in this line was soon secured, even though he possessed no capital, skill or experience.

He became acquainted with the president of a company that had invested a good many thousands of dollars in a plant for the making of brick by the then new dry-press process. The business had not been successful, and a competent man was sought to take charge of the works. Believing that the Englishman who first aroused his interest in brickmaking knew all about the business, the young man aforesaid secured this position for him and thus obtained the privilege of working under him and learning the practical details of the brickyard. His first work was in filling the molds by hand of the old, circular, revolving table Kennedy dry-press, but whether the clay should be moist or dry, coarse or fine, he did not know, and none was then able to tell him. Occasionally a good brick was produced, but none seemed to understand how it came about. A little later in the season a great improvement was introduced—the new Andrus press—and a somewhat better brick was made.

He remained upon this yard all summer, working in almost every capacity from the clay field to the kiln, and went back to his teaching in the fall with stronger muscles and with some valuable experience in earning his bread by manual labor in one of the oldest of the practical arts. Thus ended his first season in the brickyard, for which he was paid \$1 per day, probably more than he earned. The next summer again found him upon another dry-process brickyard gaining a little more experience with a little better pay for it, and following that season about six months' more of teaching, and then, and ever afterward, his whole time and his best energies he devoted to brickmaking.

You will understand that I have been relating how I became a brickmaker, employing the third person to avoid the appearance of too much conceit. But upon practical subjects, why should not a man speak of himself and his own experience of which he knows, and not alone what he has heard or thinks: of what he has himself seen and performed, rather than what he has learned from reading and conversation? We do not give much weight to a speaker or author whose information has been obtained second-hand. One of my first investments in ceramic literature was of this character—a \$5 book upon "Brick, Tiles and Terra Cotta"—not a practical treatise by an experienced clayworker, but a compilation by a professional book maker for the money that could be made from the advertisement it gave certain machine manufacturers and kiln inventors, and from its sale to such tyros in the business as myself.

I have been asked to address this Association, I assume, because I am a brickmaker, that you may hear something upon this line of clayworking from a man who is actively engaged in the work of making brick, and who thinks of little else for twenty-four hours a day, more or less. You would not care to hear me speak upon terra cotta or pottery, in which I have had no experience.

It is not my purpose, however, to describe any of the various processes of brick manufacture, nor to enter upon a discussion of any of the scientific principles involved in the manipulation and burning of clays. You get all that in your course here in much better shape than I can present it.

I have given you a brief record of my beginning and early experience in the brick business because I always think of it when I come here and see the advantages afforded by this institution. When I perceive how much better your schooling will equip you for work in a modern brick factory than mine did, it makes me feel that I would like to come here myself and begin all over again. I would like to trade four or five years of Greek for one year in your machine shop and physical laboratory; I would trade four or five years of Latin for a year in your drawing-rooms and chemical laboratories. My college course, planned after the manner of educating priests in the twelfth century, fitted me for nothing except for a course in law, medicine or theology, or as an instructor of others in the same classical studies.

Such courses pursued in so many of our colleges to this day is what overcrowds the professions and causes so much despair among our young graduates. With a thorough classical course I was turned out into the world almost helpless—with no physical training, no skill or experience in any handicraft, no acquaintance with tools or machinery, no practical knowledge of any kind. I was not as useful in the busy world about me as the simplest mechanic or day laborer who had never been educated beyond the district school. I shall never forget my first days in the brick factory, how awkward I was in performing the most simple duties, what a mystery to me was the whole *modus operandi* of the, to my mind, complicated mechanisms and processes—the boilers and engines, the shafting and belts and pulleys, the pulverizers and elevators and screens and brick presses. My inability to comprehend all this at first wrung from me the same confession that was made by a Lancashire farmer with an air of pride when appealed to by a party of friends in a commercial room: "I tell ye what, in

spite of all your bragging, I'll wedger I'm th' ignorantest man i' th' coompany."

None of the members of this Association will enter upon the brickmaking industry with so little practical knowledge as I did. Many, perhaps all of you, have, previous to beginning the course here, been in some way connected with a brickyard or other clayworking establishment. Some of you, doubtless, have a father who has devoted many years to the art of brickmaking and has built up a large and prosperous business. When you leave this school you will enter a clayworking establishment in which you have an hereditary interest. You will be the possessor not only of your father's capital and business, but also in a great measure of the knowledge of his art which he has acquired by many years of toil. And, in addition to standing in the business where your father leaves it, you will have the knowledge and training imparted in this university. Your future is secure. Your success is assured. But there are other members of this Association who have entered upon this course with less definite prospects, perhaps after considerable self-examination and much investigation of this and other pursuits, with a good deal of hesitation and indecision in the selection of a life work, having, like most of us, no marked bent or genius for anything, and with many misgivings even now, perhaps, as to the wisdom of your choice, as to your being able to secure for yourselves in this industry such a position and income as you feel that you may rightfully aspire to. Without capital to engage in business in your own name, or as an investor, you must be content for many years, perhaps for a lifetime, to work upon a salary. In other words, you have entered upon the new course of ceramic engineering as a means of a livelihood; your interest in it, outside of any attraction or adaptation to the work, is a bread and butter interest. All such of you, especially, have my sympathy and any encouragement that may be afforded by one who has struggled and is still struggling under similar conditions.

I do not want to arouse any undue or extravagant expectations of the emoluments of the clayworking industries, nor to discourage any one from undertaking this line of work by citing the many difficulties to be encountered, the many obstacles to be overcome before even a moderate success can be attained. I would not make prominent the few who may have become fairly rich through brickmaking, nor to bring forward the many who have found this business unprofitable and a means of wasting money acquired in other pursuits. You may be assured that you are entering upon a legitimate industry, the manufacture of a staple product, the usefulness and necessity of which is increasing every year, and in the development of which there is practically no limit. And you may be assured that legitimate profits will follow from the application of skill, judgment, vigilance and hard work in this industry as in any other.

It should be a mission of this school and the duty of its graduates to prevent the wasteful investment of capital in brickmaking that is being made every year at the instigation of ignorant or unscrupulous men to serve their own selfish interests. Such an investment may give you a temporary advantage, a position at a good salary for a short time, but the failure that must inevitably follow will react upon yourself as well as upon all others who, like yourself, are seeking advancement in the same line of work.

Most of you are, doubtless, expecting soon after graduation from this institution to obtain a commanding position as chemist or foreman or superintendent of some large brick factory or other clayworking establishment. In this expectation some of you may at first meet with disappointment, and think that men of education are not in demand in the brickmaking industry. You may discover that in addition to your training here some more practical experience will be quite essential in order to inspire confidence in your ability to take charge of the operations of the factory. That, in addition to the education which you receive here, there must be an education which you can give yourself only by actually performing the various operations of making from clay the finished commercial product. We learn even the simplest operation thoroughly only by doing it. When we have performed the work ourselves for a time we not only know how it should be done, but how much should be done by one man. It is said that Studebaker, the great wagon manufacturer, could himself take the place of any man in his factory. So the competent foreman or superintendent of a brickyard should be able to do a man's work in any place about the establishment.

I do not underestimate the value of the work you are doing here, but if you have not had some practical experience before coming here, or do not get such experience during your vacations or later, you will find the need of it when you come to assume control of the operations of a brick factory.

Not many years ago, if one had been asked to speak upon the subject, "The Education of the Brickmaker," his speech would have been as brief as the famous essay upon "Snakes in Ireland," since he might merely have said, "The brickmaker has no education." And some people, doubtless, have the im-

pression that such is the case to-day. When I had but a short acquaintance with brickmaking and was still somewhat doubtful of my position in it, I attended the second annual Convention of the N. B. M. A. I came an entire stranger, never having met a single member of the Association, and I shall never forget the satisfaction it gave me to find there assembled such an intelligent, good-looking, well-groomed body of men, many of whom I soon found were college graduates and the majority of whom were well-educated men of influence in their respective localities, socially, politically, financially; men who knew infinitely more than I about the subjects under discussion, and could express their knowledge clearly and forcibly in good English; men with whom it has been my privilege and pleasure to associate since then, men whom I am proud to number among my friends to-day. I know now that to successfully conduct a modern brick factory is of itself a liberal education, involving the study and solution of more problems than an outsider would dream of.

In the preparation of such a pursuit, however, there are many subjects in the curriculum of our colleges that need not and should not consume the time and energies of the student. In expressing my views upon this question, and in laying down a brief outline of a course of study for prospective brickmakers, I do not offer any criticism upon your course here. I have not, in fact, examined your curriculum and do not know how nearly it conforms to my ideas. I am aware, also, that no single course can be prescribed that is entirely adapted to every student's needs and requirements. The principle which now governs the selection of studies for a student was not given much consideration in my college days. Usefulness, in the most liberal sense of the word, is now the chief test which governs the selection of the studies in a college curriculum. When I was in college the old medieval classical course was most popular, and it took a good deal of courage for a young man to step out of this course and enter one of the new scientific courses. He immediately lost caste with his fellow-students, if not with many of the faculty. I was, myself, an ardent classicist, and for a few years as a teacher imparted my enthusiasm to numerous young men whom I helped to fit for college. Not until I became physically disqualified for a professional career and was finally unable to continue teaching and was forced to take my stand in the busy world as a worker in other lines did I realize how faultily, how foolishly, I had been educated. While trying to find something that I could do, only the absolute necessity of earning my living prevented me from falling into that class defined by Helps, "that for the first five and twenty years are elaborately educated, for the next fifteen or twenty years wait to do something, and for the remainder of their lives find out that there is nothing for them to do."

When I think how many young men there are who, like myself, having received a classical education, are sent out into the world to earn their living, which they are so unfitted to do, that they almost give up in despair, discovering too late that they are of no use in the world, that they have spent several years in acquiring a knowledge that the world will not pay for—when I think of this and recall my feelings when struggling to obtain a foothold in some useful pursuit, I feel like adding my voice to that of those who are to-day trying to reform our educational systems.

With my present experience in life, and my special knowledge of the requirements of brickmaking, were I to enter this university with the privilege of electing my studies I should first of all take the full course of drawing. One prime factor of success in life is the habit of observing accurately, and no study helps so much to acquire this habit as drawing. Moreover, drawing is eminently useful in all the practical arts and sciences. It is the universal language understood by mechanics and artisans the world over. No defect in my education has been felt so much by me in my work as that. I never received any instruction in drawing. Architecture should, of course, receive attention in this connection. The brickmaker, especially the face brickmaker, must carry out the plans of the architect; but the brickmaker should not be blamed for the faults of the architect, as I understand he was in a recent lecture before your Association.

Next, I would take the complete course in mathematics, because a knowledge of mathematics is, to a certain extent, useful and necessary in nearly all scientific pursuits as well as in engineering and the practical arts and affairs of life. Moreover, the study of mathematics develops, as nothing else will, the reasoning faculties and the power of concentration, which are so essential to success in every calling.

Next, I would take up the natural sciences in the order of the curriculum—physics, chemistry, geology, zoology and botany—including, of course, human physiology and biology. I would be sure not to neglect the laboratory work, nor the work in the carpenter shop, blacksmith shop and machine shop. I would also give some time to military drill and athletics, and would follow the prescribed course in history and ethics and political economy.

But what about languages? Well, I would study the English language and get all possible practice in its correct use, since facility of expression in good English is very useful in the earning of one's bread and butter in this country of ours. But what about Greek and Latin, French and German? I would not in a college course study more than one foreign language, and that should be the one likely to be of most use to me in after life—in the ceramic course, German. The benefit to be derived from the study of languages is, I believe, largely overrated. If the study of a foreign language gives one a better command of his own language, this benefit can be obtained as well by the study of one foreign language as by the study of several, and then there is a chance that in a four years' course sufficient facility can be acquired in one modern language to enable a person to make it of some practical use. I have had a complete classical course, including, besides Greek and Latin, French and German and a private course in Spanish, and have some experience in teaching Latin and German, but I am unable to-day to make an accurate translation of a page of any of these languages without more or less use of the dictionary, and I have lost the little facility I once had in the speaking of German and Spanish. But if I had never studied any other foreign language but German I might now be able to get much information of value in my line of work without so much drudgery. The time is coming when the study of so many languages will not be considered necessary or desirable as a training for any pursuit. The wonderful progress of science and its practical application in the nineteenth century has opened up new and more useful fields of study and investigation, and a proper use of his time would seem even now to demand that a student should cut off from his course much that was formerly considered essential to a man of education. Emerson realized this when he said: "We are students of words; we are shut up in schools and colleges and recitation rooms for ten or fifteen years and come out at last with a bag of wind, a memory of words, and do not know a thing. We cannot use our hands or our legs, or our eyes or our arms."

Young gentlemen, members of the Ceramic Association, you have chosen a large and fruitful field of labor. If you pursue the course faithfully you may be assured of useful and profitable employment for the rest of your days, and no matter how long you may live and work you will never learn all about clays, nor the manufacture from them, if even a single product of commerce. Your training here will enable you to take up any special branch of the clayworkers' art and investigate it and develop it in a rational, scientific manner, and thus the influence of this school will be felt upon all the ceramic industries of this country.

Speaking as a member of the N. B. M. A., which took such an active interest in the establishment of the Ceramic Department of this University, I can say that the brickmakers of this country are expecting great things from this school. They believe it will be the means of definitely settling some problems that have long troubled them and hindered their progress; that it will make brickmaking a safe and less hazardous business, one requiring more brains and more capital, perhaps, but one producing more certain and more profitable results. They do not expect this institution to become a free bureau of information for clayworkers, but they expect that its means and resources will be devoted to the training of men equipped to meet all the requirements of modern brickmaking, and that they can obtain through this school honest and capable managers of the technical part of their business.

Fifteen years ago I would have been fortunate, indeed, to have had the advantages you now enjoy, and I would have made almost any sacrifice to have secured them. My education did not help me much to become a brickmaker, my sheepskins were not recommendations that would secure me a position in a brickyard. I had no practical or theoretical knowledge of clayworking, and it was not easy to get started. After three years of varied experience upon a brickyard I was able to obtain a salary of \$1,000 a year, and since then my income has been sure and constant, probably more so than that derived by my employers from the business, and while not so large as to excite envy, yet as large as that of the average lawyer or doctor, teacher or preacher. These professions have the advantage of enabling a man to elect his place of residence to a great extent, whether in the city or country, North or South, East or West, and undoubtedly give him a higher social standing at the present day. The brickmaker, on the other hand, must reside where the clay is, and this is often in out-of-the-way places, in small villages or far in the country, and his social advantages may be very much restricted, but his income will generally be as great as that of the professional man, other things being equal, and his country home gives him purer air and water and a longer, happier life.

The occupation of the brickmaker is a healthful one, and agreeable to an active man of practical, scientific tastes.

Though my entry upon this pursuit was a disappointment

to myself and my friends, though forced to abandon the bar for the claybank, I would rather to-day be a brickmaker than a lawyer, and were my hearing fully restored I would not change my occupation. This may not be a compliment to the brickmaker, and it is not intended to be complimentary to the legal profession, from which I am glad to have escaped.

Young gentlemen, you will be brickmakers of the twentieth century, which will be an age of clay and its metal, aluminum. It will be an age of brick houses and brick streets and roadways, an age when the forests will not be devastated for the purpose of erecting buildings that do not last a century and that are a constant menace to the lives of their occupants; an age when the materials of building construction will come from out of the earth instead of being grown upon its surface; when the basis of durability of all structures will be the inexhaustible and indestructible clay. It will be an age, moreover, of educated men, not in the professions alone, but in every business, in every productive industry; an age of specialization and technical training; an age, moreover, of sharp-spirited competition and the survival of the fittest, when those who strive for the mastery must not only be temperate in all things, as Solomon advised, but must have strong minds and strong bodies, both trained for the special work to be performed.

The clayworking industries need men of education, college graduates, whose minds have acquired the power to study and investigate and solve the problems and difficulties that obstruct the highest development of the clayworker's art, men whose knowledge of natural laws and forces, of the practical application of scientific truths, will dispel error, will correct false methods and wrong practices, will establish more rational methods, more effective and economical processes; men who know how to use their eyes and hands as well as their minds; men who will aid in producing from the common clay by positive methods those numerous articles and utensils that add so much to the beauty and comfort of the home, and that have been made and used to the extent of their skill and knowledge by all peoples in all times; men who will elevate the ancient and honorable craft of brickmaking to the important position it must hold in the coming century, when buildings constructed of burned clay will be recognized as the only fit habitations of those whose lives are valued more than all else in the world, and whose health and comfort will be the highest consideration of society.

A BRICKWORK FIREPLACE.

There seems to be a general idea that the brickwork about a fireplace must end a short distance above the opening, but in that case the best effect of the brickwork is lost. In the case mentioned it is carried up to a height of over 6 feet, forming a mantel and a handsome panel above, in which may be placed with excellent effect a marble clock. The opening in the fireplace is 3 feet wide and 3 feet high and has the number of courses of bricks above the opening. The panel is 3 inches deep and the upper course of brick in the mantel projects 3 inches, giving a mantel of 6 inches; but the design is to have a slab of red granite fitted above the projecting bricks, which will project an inch over the upper course. The bricks are dark red, pressed, laid in red mortar, made by mixing dry Venetian red paint with common mortar. It will take 400 pressed brick to construct such a chimney and mantel, the backing, of course, being done with common brick, and about 25 pounds of Venetian red to color the mortar. The brickwork should project a little way into the room to give the best effect. In the back of the panel may be set a mirror of plate glass, which will very beautifully reflect the color of the brickwork. Old-fashioned brass andirons, with shovel and tongs, will go admirably with such a fireplace.—Country Gentleman.

ILLUSTRATING UNCLE SAM'S WEALTH.

The Bookkeeper of Detroit finds that the last census shows the true valuation of real and personal property in the United States to be \$75,037,081,197. It figures that this is about six times the value of the money of the entire world, and then that the average mind can more easily grasp the meaning of such large figures, it graphically illustrates by these comparisons:

"This amount in gold dollars would load 123,570 carts, each carrying a ton. If 2,000 gold dollars were piled one on the other they would form a stack three feet high. Make similar piles close together till a wall of gold one mile long and worth \$230,400,000 is formed. Increase this wall to twenty-eight and one-fourth miles and the amount would represent our national wealth. Placed side by side the coins would form a carpet of gold covering five square miles."

A MANUAL FOR THE MANUFACTURE OF BRICK.

WE HAVE BEFORE US three parts of this German work, now being published. As we have predicted in the Clay-Worker several months ago, this book is to be a valuable addition to the clayworking literature, for which the names of the authors, K. Duemmler and Frederick Hoffmann, are a sufficient guarantee.

Volume II treats of the origin of clay, in clear language, without going into intricate theories of the non-plastic substances, the fluxes and coloring ingredients. It also discusses the chemical and mechanical impurities and the testing of clay, including the chemical and mechanical analysis and the determination of the refractory power.

In Volume III the author speaks of the examination of clay beds and the testing of burned clay ware for its important physical qualities. Division 8 of the same volume treats of the properties of clay; Division 9 of the compositions used in decorating clay ware, as slips, glazes and colors.

In Volume IV the practical processes of winning the clay are fully discussed and illustrated by numerous cuts, among which we notice many of our American appliances—a fact which shows that the author is well informed on his subject. Chapter 9 describes the purification and preparation of clays, where we find full mention made of the washing process with the latest appliances.

The book is certainly to be one of the standard works of our literature, and we again urge our readers who can use the German language to subscribe for the manual. The publisher is Wilh. Knapp, Halle-on-the-Salle, Germany.

BRICKYARD EXPERIENCE.

UNDER the above head I found in a back number of the Clay-Worker a little story about an incompetent engineer that may appear overdrawn to some. It recalls to my mind an incident in real brickyard experience that matches it. The yard in question had in its employ an engineer who was considered a good man. He held a marine license from the government inspectors to run the engine on a hundred-ton vessel. The morning in question, when I was a mile away from the yard, I heard the exhaust give one long and one short snort, which told me that there was something the matter with the "cut-off." When I reached the yard the engine had stopped, having used up all the steam. After getting a load of steam, the machines were started, only to run a short time. Then the boss appeared and wanted to know what was the trouble. The engineer said that something was wrong with the cut-off. "I'm going to take the top off and see." He did so, with the boss's help, to find it all right. The parts were put back, steam made, the machine gotten ready to hook, and when the steam was turned on the same long and short snort as before. After looking all over the engine three or four times to see what was the matter, the engineer said he did not know what was the cause. The boss was one of those short-tempered men, and he sputtered around and then sent for a man from the machine shop at Haverstraw, who was at work on Mr. Gilles's yard. He, however, could not come at that time. After dinner they got the engineer from the next yard to come and examine the engine. He had been a locomotive engineer for some years. He came, made an examination and recommended something, which was done, steam turned on, with the same result. It was now 4 o'clock in the afternoon, and still they were unable to locate the trouble, as well as losing a day's molding, and it looked as though the next day would see no improvement. As a last resort the boss went for the first man he sent for. He came and looked over the engine and said: "Take off the top of the cut-off." The boss said: "There's no use of that; we have had it off a half-dozen times to-day; it's all right." "If that is so," said the other man, "you have no use for me. Good-day." And he started off. "Hold on!" said the boss, "we will do as you want." They did as he requested; he looked at the cut-

off, said it was all right, took a step or two to where the eccentric works on the shaft, called the engineer, and, pointing to the eccentric rod, asked if he had looked at that. He found that the eccentric rod had slipped out of place. In half an hour it was replaced, and things were all right. The engineer, as well as the man from the other yard, knew that the trouble was connected with the cut-off, but did not look any further than the cut-off itself for the cause. The cases are similar. The engineer who is employed on most yards would not know how to answer the question: If the manhole cover should fall in the boiler with sixty pounds of steam on, what should be done? He must be cheap. Never mind his ability.

MACHINIST.

A SIMPLE METHOD OF MAKING DECORATIVE BRICK.

There comes to us from Perth Amboy, from Mr. Antonio A. Mundy, a new method of making decorative brick. He says these ornamental bricks can be made in soft or tempered clay, and the brass plate which contains the negative of the ornament must be placed in the side of the mold. The stiff block of clay is then put in and pressed. The plunger of the press forces both the brass plate and the clay from the box of the



AN ORNAMENTAL PANEL OF COMMON BRICK.

press; the plate is then removed from the clay, leaving a perfectly formed brick with the required ornament. This method is applicable to the ordinary hand work which is in general use in many sections, and which presses the brick on the flat. If a press was so constructed as to press a brick on its edge, then the plate containing the ornament would have to be placed in the bottom of the mold. The picture shows what Mr. Mundy has done. He shows the rare quality of those who take an interest in manufacturing methods, being able to select and adopt a beautiful pattern. Most patterns for decorative brick are so irredeemably ugly that one interested in things artistic says, "If this is machine art, we will have none of it." So it is the machine suffers through no fault of its own and through no fault of the mechanical ingenuity of the designer. In order that the machine which produces artistic form should have success, it should be guided by the hand of an artist. Nearly all mechanical inventors imagine they have the artistic as well as the mechanical touch. That is rarely true; hence the loss to the world of many valuable mechanical ideas.



THIS DEPARTMENT IS DEVOTED EXCLUSIVELY TO INVENTION AND PATENTS RELATING TO THE CLAY INDUSTRY, AND IS EDITED BY MR. EDWARD C. WEAVER, ATTORNEY AND COUNSELOR, IN PATENT LAW, MCGILL BUILDING, WASHINGTON, D. C. COPIES OF ANY PATENT WITH DRAWINGS WILL BE SENT AT COST, NAMELY: TEN CENTS FOR EACH COPY. ANY INFORMATION AND ADVICE IN REGARD TO PATENTS WILL BE GLADLY GIVEN. ADDRESS ALL COMMUNICATIONS TO THE EDITOR.

THE INVENTOR'S DILIGENCE.

IT MAY BE SAID that where it is given that there are two or more contestants for a patent upon the same invention, the question of diligence only affects the one to first conceive the immature or nascent invention, for those who follow are not to be considered unless they are the first to reduce to practice. The second party to conceive, no matter how diligent he may have been in making his application, has not even a prima facie right to the patent unless he can show that he was the first to reduce the invention to practice, and upon this latter ground only can his claims be based. And furthermore, the prior reduction to practice by the second to conceive will avail him nothing unless the prior conceiver has failed to use due diligence or a reasonable diligence in seeking the protection afforded him by the patent laws. It thus becomes a very interesting point to inventors what this reasonable diligence may comprise, for there are certain conditions and vicissitudes the law takes notice of as being necessary drags to the inventor's progress and speed, and others that are due to his negligence alone.

The law takes proper notice of the difficulties the first conceiver has to contend with to give his idea a concrete and perfect form; thus, where he is destitute and without friends, much indulgence is shown him, but not when it is shown that he carried on other enterprises at this time. The facilities at the inventor's command are also considered, and, of course, sickness long continued may become an important factor. It may be broadly stated, however, that the reasonable diligence expected of an inventor is that which a careful man would ordinarily show in his business affairs.

It can now be readily seen that the delay of which many inventors are guilty could not in any sense be considered of this nature. It is not excusable, and the law does not protect lazy men. It is never too soon to ascertain the place of the invention in the art it may come under, and to ascertain whether it is truly novel in the first place, and then rapidly reduce it to a perfect form, ready for patenting. When thus complete, laches in duly filing an application for letters patent for a considerable length may carry the matter into the subject of abandonment.

588,987. POTTERY MUFFLE OR KILN. Frederick Hancock, Burslem, and Charles B. Winzer, Shelton, England. Filed Feb. 9, 1897. Serial No. 622,616. (No model.)

Claim—1. In combination, a firing-chamber *a*, surrounded with flues for its entire length, and having duplicate warming-chambers *b*, built at one end and on opposite sides of and doubled back alongside the chamber *a*, to their inlets *d*, and a cooling-chamber *c*, at the other end and on one side of and alongside the chamber *a*, and doubled back on itself to its outlet *e*, as set forth.

589,104. SEWER-PIPE AND EARTHENWARE MANUFACTURING MACHINE. Daniel Spooner, Independence, Mo. Filed June 26, 1896. Serial No. 597,076. (No model.)

Claim—1. In an apparatus of the character described, the combination with a clay-cylinder, a superposed plate, plugs depending therefrom, and cores mounted upon said plugs and depending vertically into the clay-cylinder, of a presser-head mounted upon said cores and adapted to reciprocate in said cylinder, substantially as described.

589,236. CRUSHER AND PULVERIZER. Milton F. Williams, St. Louis, Mo. Filed Sept. 3, 1896. Serial No. 604,722. (No model.)

Claim—1. The combination with a shaft, of hammer-supports strung thereon, said supports being formed with projections, the projections of one support being staggered relative to the next adjacent support, so that the projections of every other support align, through-bolts which pass through said projections, and hammers on said through-bolts and between the projections, said hammers being in line with the body portion of the support for the next adjacent hammer, substantially as described.

589,892. BRICK MACHINERY. Axel Gord, Grant Park, Ill. Filed May 7, 1896. Serial No. 590,581. (No model.)

Claim—In a brick-machine, the combination of an endless belt supported on suitable pulleys, a pair of link belts suitably supported, a number of pairs of vertical rods each pair fastened at each end to said link belts, one of each pair of rods adapted to be driven by said endless belt, a shaft provided with suitable hubs, a number of arms pivoted in pairs to said hubs, each pair of arms joined near their ends by a wire, and provided with projections which are adapted to be received between said pairs of vertical rods, and a means of limiting the oscillating movement of said pivoted arms, as and for the purpose set forth.

589,895. DRYING-KILN. David Hill and James S. Hill, Washington, N. C. Filed Dec. 16, 1896. Serial No. 615,921. (No model.)

Claim—1. In a drying-kiln, the combination with a drying-chamber sealed at its bottom and sides, and having a discharge passage communicating with the top of said chamber, of a heating device in said chamber, and means for positively removing aqueous vapor from said chamber through said discharge-passage, substantially as described.

2. In a drying-kiln, the combination with a drying-chamber sealed at its bottom and sides, and having a discharge-passage communicating with the top of said chamber, of a heating device adjacent to the bottom of said chamber and an exhausting device communicating with said discharge-passage, substantially as described.

590,365. POTTER'S MOLD. William A. Dechant, East Liverpool, Ohio. Filed March 16, 1897. Serial No. 627,906. (No model.)

Claim—1. A sectional mold for potters' use, comprising the case 3, the parting-frame 4, and the detachable die 8, secured in said case by the parting-frame 4, substantially as and for the purpose set forth.

2. A potter's sectional mold comprising the integral cope forming a socket or case, an integral detachable die, and an integral frame provided with steady-pins 7 7 detachably secured to said cope and adapted to detachably secure said die in said cope, in combination with the counterpart integral detachable drag 1, comprising a socket or case, an integral detachable die, and an integral frame provided with conical recesses 6 6 detachably secured to said drag, and adapted to de-

tachably secure said die in said drag, substantially as shown and described.

588,621. BRICK-DRYER. Hiram H. Walsh, Passaic, N. J. Filed Aug. 18, 1896. Serial No. 603,156. (No model.)

Claim—A drying-kiln having at one end parallel supply and exhaust headers, radiating-pipes adapted to discharge the heating medium either within the kiln or into the exhaust header, a system of supply pipes and valves whereby either live or exhaust steam or both may be used in connection with products of combustion for heating purposes, a fan in the exhaust header and damper-controlled passages permitting the waste

the hopper and the flexible packing strips or flaps carried by said exterior strips and extending along the sides of the hopper between the lower edges thereof and the conveyor to prevent leakage.

588,885. KILN. Carl Schlimp, Vienna, Austria-Hungary, and Rudolf Honzik, Bucharest, Roumania. Filed Aug. 4, 1896. Serial No. 601,663. (No model.)

Claim—In a kiln, the combination with a series of chambers, a chimney, an air-duct extending around the said chambers, a passage from the said air-duct to the chimney, branch passages connecting the said air-duct with each of the chambers, passages connecting the said chambers with the chimney, and valves to open and close the said passages and to open the said air-duct into the chimney; of gas-passages extending between the said chambers, branch passages connecting the said gas-passages with the said chambers and with the air-duct, and valves in the said passages for controlling the supply of gas, substantially as described.

VALUE OF GOVERNMENT STATISTICS.

Have the statistics of the clayworking industries of the United States issued by the government in pamphlet form and sent out to different parts of the country any value? As one looks over the statistics, each may have an individual opinion of the value therein contained, as their knowledge of the output or the number of yards, as well as the price for thousand, is limited. The government sends out to all engaged in the manufacture of brick, asking them to answer the questions, and many fail to do so. It certainly is not a very accurate way of learning the number of yards in the different States. I will quote a few, as no doubt many of your readers will not see the publication:

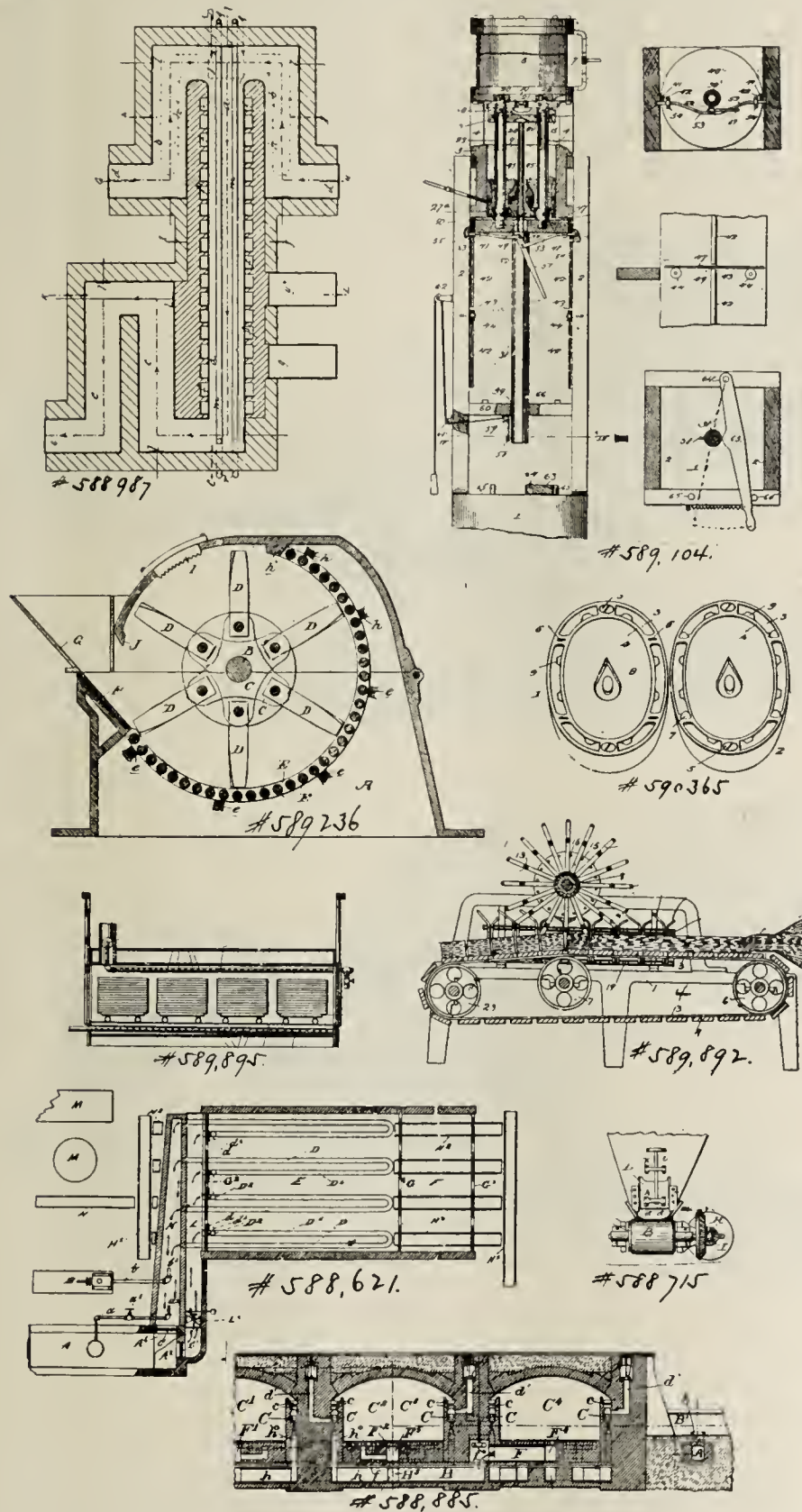
| | Yards. | Output. | Average Price per M. |
|---------------------|--------|-------------|----------------------|
| Alabama | 80 | 49,817,000 | \$5.29 |
| Arizona | 19 | 9,060,000 | 5.69 |
| Arkansas | 71 | 26,472,000 | 6.11 |
| California | 91 | 74,240,000 | 5.27 |
| Connecticut | 47 | 166,995,000 | 5.79 |
| Delaware | 26 | 8,091,000 | 7.09 |
| Florida | 35 | 17,376,000 | 5.13 |
| Georgia | 88 | 132,469,000 | 4.64 |
| Idaho | 19 | 2,150,000 | 7.30 |
| Indiana | 827 | 262,936,000 | 4.59 |
| Illinois | 836 | 586,506,000 | 4.83 |
| Massachusetts | 123 | 274,956,000 | 5.82 |
| Missouri | 290 | 263,037,000 | 5.00 |
| New Jersey..... | 140 | 237,781,000 | 3.99 |
| New York..... | 295 | 931,565,000 | 4.45 |
| Pennsylvania | 536 | 677,444,000 | 6.10 |
| Rhode Island..... | 1 | 28,000,000 | 6.25 |
| South Carolina..... | 56 | 70,114,000 | 4.35 |
| Wyoming | 5 | 520,000 | 8.76 |

In a State where only 520,000 are made it would seem as if the net should be larger. In New Jersey and New York, as well as South Carolina, \$4.35 and \$4.45 and \$3.99 give your readers food for thought. If the figures show the net returns for 1896, what must be the net for 1897?

As the tide-water brick of New Jersey is by far the largest, and millions of them were marketed below that figure, with freight and commission off, it would seem a high average. Tide-water brick in New Jersey did not reach much above that figure the season through, with freight and commission of ten shillings per thousand off. Of the 295 yards quoted, one can count on water in New York—that is, which can reach New York market not through the canal, but from along the Hudson and Long Island Sound—over 130 yards. Certainly tide-water brick are shipped in such numbers that they pull the average of the State below the rates quoted. It seems as if those who furnished the figures on the prices must have looked up prices long since received. The Long Island manufacturers must be scarce when only one yard reports.

A. N. O.

F. E. Porter & Son, Grove City, Pa., write that they would like to correspond with manufacturers of stoneware machinery. They also desire to communicate with an experienced kiln builder and a first-class glazer.

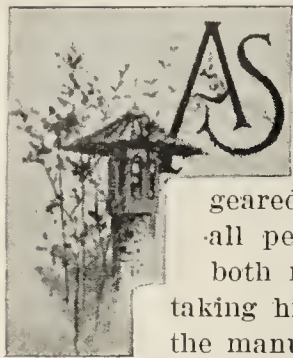


heat to pass through the heating-pipes or directly up the smoke-stack.

588,715. FEED-REGULATOR FOR CLAYWORKING MACHINERY. Henry C. Ingraham, Beverly, N. J., assignor to the American Clayworking Machinery Company, Bucyrus, Ohio. Filed May 5, 1897. Serial No. 635,189. (No model.)

Claim—The combination with a receiving bin or hopper having downwardly-converging sides and a bottom discharge, of a conveyor below said bottom and consisting of an endless apron or conveyor and means for operating it, a vertically-adjustable gate at one end of the hopper for regulating the discharge, strips extending along the lower exterior edges of

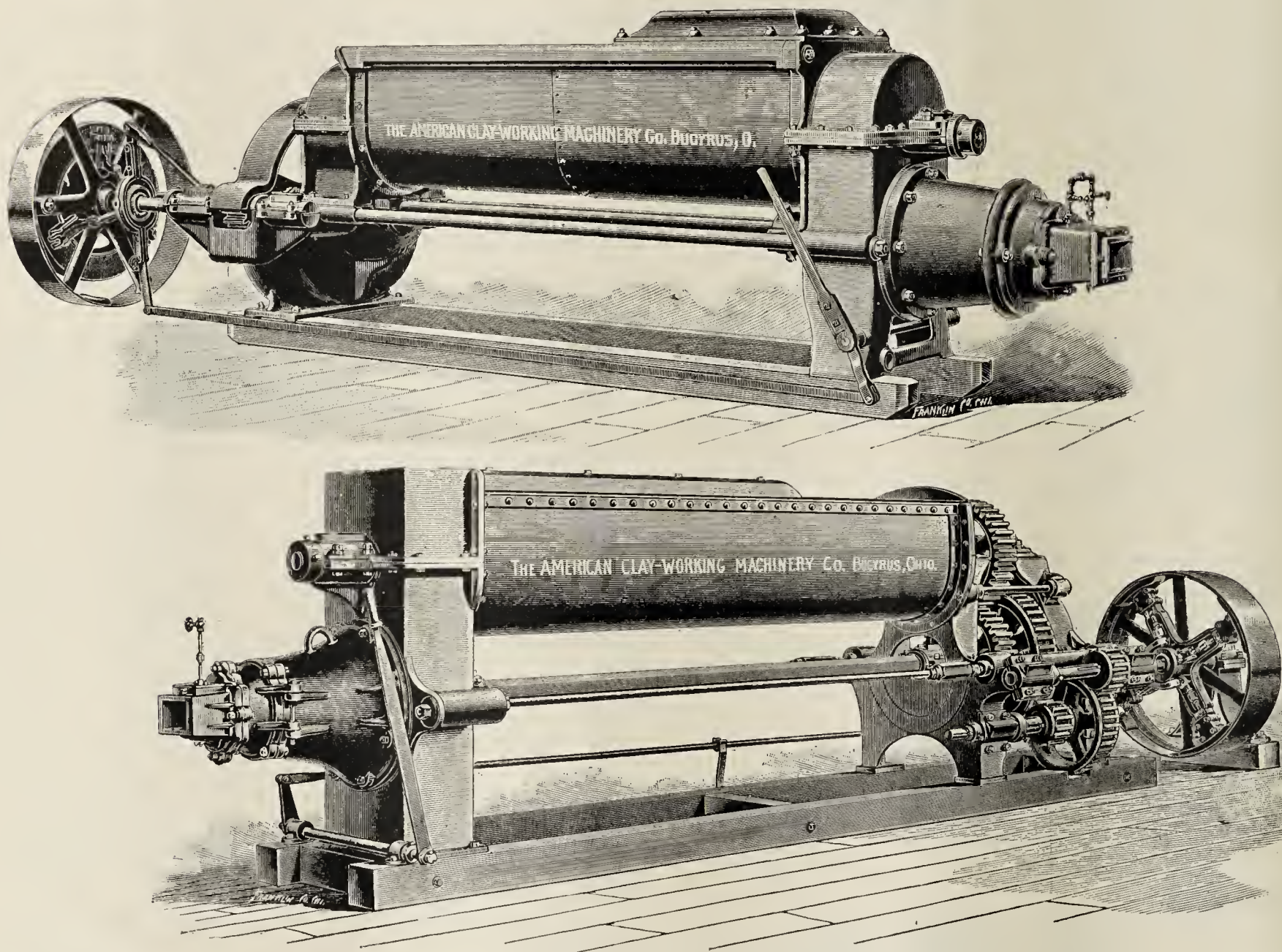
NEW COMBINED BRICK AND TILE MACHINE.



USUAL, the American Clayworking Machinery Company, of Bucyrus, O., is the first to give the clayworker a choice in combined machines. They seem to recognize that both the single and double-gear machines have their friends, and to suit all persons they have placed upon the market both machines, which permits of the purchaser taking his choice and not being compelled to allow the manufacturer to dictate in gearing. In addition to the matter of gearing these machines embody an advantage which no careful clayworker should overlook, viz.: They are built upon the correct principles of all the machines manufactured by this company, which insures the highest degree of satisfaction attainable in machinery.

The newer of these two machines is the No. 2, which has

various ways, be considerably reduced, it cannot be entirely avoided. With long bearings and most carefully constructed boxes, the minimum of friction has been attained and wasted power saved. Some of the many points of advantage follow: The shafting is of forged steel. The gearing is of special design, extra strong. The main spur wheel and pinion are $7\frac{1}{4}$ inches over housings. The intermediate gear and driving pinion are $6\frac{3}{4}$ inches over housings. Both intermediate and driving pinions are made of cast steel. The two large gears that drive the pug mill are $5\frac{3}{4}$ -inch face. By having the gearing housed is secured from 25 to 35 per cent. more strength on the same size gear than on the ordinary plain gearing. The machine is back geared 9.86 to 1, which gives a very strong and easy motion. The driving pulley is of friction-clutch pattern. The nozzle is planed on both ends and securely fastened to the vertical feed chamber. The front which receives the dies is also planed on both ends, so as to make a perfect joint; it is secured to the nozzle with extra heavy cast-iron hinges, thus



NEW COMBINED MACHINES FOR BRICK, HOLLOW BLOCK AND TILE.

been placed upon the market in the past thirty days, having been in operation some two months to give it the most rigid test possible before offering it to the public. After this most exacting trial it has been given the seal of approval, and is now placed along with other machines in what the American Company terms the class of "machinery that never disappoints."

The No. 2 machine is a combination of a No. 2 Giant brick machine and a No. 14 pug mill, giving two machines of the greatest capacity in one. They are most generously proportioned, the weight being much greater than in any other similar machine, and each pound is put where it will do the most good. The bearings are all extra large and protected. Friction is the highway robber of mechanical energy, and it is always present and ready to levy tribute wherever machinery is found in motion. The contribution to friction is always a large percentage of the whole applied force, and while this percentage may, by

enabling the operator to clean the machine or remove the die at will. The gear frames are made extra strong. They are planed so as to make a perfect fit. Both bearings of the main shaft in the gear frames are $13\frac{1}{2}$ inches long. The bearings of the intermediate and driving shafts are 12 inches long. The caps over the bearings are all properly fitted. The oil chambers in these caps are large and provided with suitable covers to exclude the dust. The outer end of the pulley shaft is provided with a good and substantial bearing 12 inches long. The pug mill shell is made of boiler-plate steel, one-fourth inch thick. It is ten feet long, an extra length of over two feet more than any other machine built, giving much great pugging capacity. The mixing shaft is made of hammered steel of hexagon shape. The mixing knives are made of steel fitted into movable socket hubs, allowing each knife to be set in six different positions. This machine has a capacity to prepare the great amount of

clay which the brick machine is capable of taking care of. Dimensions of machine: Height, 5 feet 4 inches; length, 21 feet; width over all, 6 feet; weight, 14,000 pounds. Capacity, from 2,500 to 4,000 brick or 1,000 to 2,500 four-inch tile per hour. As in the No. 2 machine, so also in the No. 1, the shell is made of best steel plate, 24 inches in diameter and 8 feet long. Its shaft is of forged steel, and fitted with adjustable knives, which can be removed at pleasure. The clay is carried forward by these knives, and is discharged into the auger case through a feed opening. All bearings are of the proper length, carefully fitted and provided with suitable oil boxes. A strong point of advantage is the gearing, which is of most substantial proportions, and is neatly incased. The machine is fitted with our celebrated friction-clutch pulley, which places the machine under the immediate control of the operator. Dimensions of machine: Height, 4 feet 10 inches; length, 17 feet 10 inches; weight, 10,230 pounds. Capacity, from 2,000 to 4,000 brick per hour, or 1,000 to 2,000 four-inch tile per hour. These machines are adapted for making tile from three to twenty inches in diameter, hollow building blocks, fire-proofing, brick, etc.



EXPLOSIVE BRICK.

DID YOU EVER hear of a brick exploding? Did you ever see a brick get chock full of pent-up passion and then suddenly let loose like an anarchist orator or a dynamite bomb?

Well, down East, where they make brick in the simple, slobbery way of the Pharaohs, they find a streak of clay now and then that has peculiarities actually shocking under certain conditions. Early in the fall a burner who was not acquainted with such clay undertook to burn a kiln. There were no hard-burnt bricks handy when he came to settling the kiln, and so he took several green brick from the hack. He set them on the top of the kiln to sight by, that is, to show him how fast and how far his kiln settled with each dressing. The brick stood like faithful soldiers in rows along the kiln top until they grew nearly as hot as the platting upon which they rested. The burner had climbed the ladder to take a look when suddenly the nearest brick to him jumped into the air about a foot and with a loud report was shattered into numberless pieces. Then, as if obeying a signal, each brick on the kiln top exploded after first leaping into the air. The burner was actually scared. He thought he saw in it a murderous design of someone to blow the whole kiln up. He fled from the yard, yelling to his helpers to "get away from the kiln quick." He was stopped by the proprietor, who asked him what was the cause of his agitation. Then the proprietor had a hearty laugh and they went back and tried some more brick. They popped just as the others did. Though the proprietor knew that his brick, particularly those made of clay taken from the top of the bank, would snap some, he was not aware that they were quite so explosive. The kiln itself burned without popping, but the helpers amused themselves by exploding bricks throughout the burning.

Sometimes these explosive brick are found in the body of the kiln. Often one or two situated close to the fire will be found broken into fragments when the kiln is cooled, showing unmistakable marks of explosion. On the yard mentioned above, years ago, the greatest care was necessary to warm the brick gradually to prevent wholesale popping. Of late years the precaution was not necessary.

In Bald Hill Cove, ten miles from Bangor, Me., a rich corporation started a brickyard twenty years ago or more. They

put in a Martin sand machine and had all the new-fangled ideas of that time in the way of handling and drying brick. Among the improvements was a permanent kiln, the only one built in a Maine brickyard, so far as I can learn, up to that time. This kiln cost \$3,000 or more. Its style or title I am unable to say, but its ruins still form a heap in the deserted yard. The kiln was pronounced a failure after the first burning. Two hundred thousand brick made from the surface of an immense clay bank were put into the kiln. Though the man who superintended the burning is still alive and endowed with good memory, it can not be said now whether there was any unusual noise during the firing of the kiln. Yet when they opened the kiln and went to count out the brick three-fourths or more of the contents of it was shoveled out in the form of dust and small bits of brick. That settled the fate of the new-fangled kiln and the Bald Hill Cove Brick Company only survived it a few years. Had care been taken with the first firing or had the kiln been filled with brick taken from the body of the clay hill, there is little doubt that the kiln would have been fairly successful. But that's another supposed case of "hard luck."

I suppose the greatest fright a burner ever got from his kiln was given to John Dunn, in Lincoln, Me., several years ago. The clay for the brick had been dug from a sort of marsh. It was tough stuff to handle, but made good brick. The yard had been idle for many years and Dunn was called to burn the first kiln. The charging had burned pretty well out and the cherry glow extended from peak to peak. Dunn was sitting on the wood pile resting and enjoying a smoke when suddenly he heard a series of explosions inside the kiln, the ground trembled and the kiln seemed about to waltz off the kiln ground. A shower of rock assailed the roof for half a minute and then all was still. The frightened burners crept back to the kiln and began a cautious investigation. One of the middle arches was found filled with crumbled clay. They went on top and found a hole about three feet in diameter, extending clear to the arch below. The top of the kiln was covered with dust and fragments of brick. The men hunted over the dump for some of the mementoes of a "Medford (rum) burn" of years before and found a mass of clinkers which they dropped into the hole. It lodged near the juts. They then threw soft mud down upon it and filled up the hole with clay and brickbats. There were no more explosions and the burn was above the average.

The story is told of a cross-eyed, near-sighted, good man, whose parents wished him to study for the ministry, but he would not. He started a brickyard instead. He first distinguished himself by rushing out alone in the storm one night and weathering all the hacks. One large hack in particular, along the side of the yard, he took special care to cover well, because it was so tall. He stood the usual weather boards against it and then got spangs and built a "capann" to still further protect it. He returned to bed just before dawn and when the crew reached the yard in the morning they were inexpressibly affected to see the square side of the clay bank so well protected from the storm. Then Thad set fire to his first kiln and the most dreadful rumbling and explosions took place. Thad looked upon it as a warning and quit the business to study theology. He is still preaching and no doubt expending lots of energy in protecting spiritual clay banks that stand high while small-sized hacks of brick receive loving but briefer attention.

There's a good deal of snap in some clays, and I am not prepared to deny the statement made that two cents' worth of nitro-glycerine and a handful of clay would demolish London. The cause of this explosiveness in brick is, I presume, the result of the nature of the clay to form a hard and almost impervious shell around a porous and damp center. When the pressure within reaches a certain degree the shell bursts, just as other shells did in the sixties.

There's no end to the queer kinks in clay. THADDEUS.

A wise man will not attempt to break the bicycle record on an old-fashioned velocipede any more than he will attempt to do business without modern methods of advertising.—Ad. Sense.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

CONVENTION ECHOES.

Glad He Joined the N. B. M. A.

My Dear Mr. Randall—I have read the report of the Convention all through, and enjoyed the papers much more than if I had not attended the Pittsburg meeting. I feel that I gained much in going to the "best Convention yet," and I only regret that I have not always been a member and attended every meeting of the organization. I shall certainly make an endeavor to attend in the future.

I was very glad to note your wise suggestion in regard to a paper on art in ceramics for our next meeting. That will be one of the leading features of our clayworking craft in the future, and a feature that will make wonderful progress in the next ten years; therefore, our organization will be right in being in the front rank in that as in all other branches of the great clay industry.

Yes, I believe in the N. B. M. A., and that it has a future, and a fine one, seems a sure thing to me. I am proud of our Pittsburg meeting and the report thereof. I see nothing of which to complain. Brother Taylor has expressed everything I could say. So with best wishes for our Pittsburg brothers, our Clay-Worker and our Secretary, I am

Yours fraternally,

Salem, O., March 11, 1898.

D. E. PIDGEON.

"Father" Pike's Impressions.

Friend Randall: Yours of the 8th inst. at hand. In reply would say, without in the least deprecating the efforts and grand successes of those who have made it possible for us to pronounce each succeeding Convention better than the preceding one, I must say that our recent one at Pittsburg is the crowning sheaf of them all.

What was so marked in the way our good Pittsburg friends handled and entertained that large body was the lack of friction. There was little or no effort perceptible on the surface to indicate to us as guests that we were being entertained, which with some makes them "ill at ease." We were allowed, as it were, to roam at our own sweet will, and enjoy ourselves to the utmost, while all Pittsburg, from the mayor down, seemed omnipresent on all occasions, to see that nothing molested or made us afraid.

Why should each Convention be better than all its predecessors? We must remember we not only have the experience, but those who have been our entertainers follow the wake, and with their gracious presence, tact and good cheer make them welcome guests, who help entertain themselves. Again, the ensemble of our membership is much improved. When we first started out we were just common brickmakers, hand-made, barefoot off-bearers as it were, while now we are machine made, rock-faced, pressed brick fronts, with enameled brick trimmings, and have already commenced to talk about "art in clay." Why not talk "art in clay" and execute it as well, for we have the mental force, pluck, push and perseverance, to a successful ending.

Art in clay is what the watch spring is to pig iron; it is

not the raw material, but the applied skill, that gives it value.

Getting out from under the clouds of financial gloom into the glorious sunshine of "prosperity" makes our faces lengthen crosswise instead of up and down. We have been under the ban so long that some of our foreheads have so elongated that they nearly reach the cerebellum. But we can soon sing the old cradle song, with chorus, "When We Were Hard Up," etc. We will not even let Morro Castle, near the mouth of the Mississippi river, disturb one brickmaker's dream.

Naught but pleasant memories follow the wake of the Pittsburg Convention with me. All seemed to have windows in their rooms, as well as open windows to their better natures, which is well and as it should be. With pleasant anticipations of the next Convention, wherever it may be, I am yours fraternally,

E. M. PIKE.

Chenoa, Ill., March 9, 1898.

Suggestions for Future Work.

Friend Randall—The Pittsburg Convention was indeed a success. There seemed to be opportunities to learn more from the papers which were read and the discussions which followed than there were in any previous Convention that I have attended. It is certain that the practical men were in evidence, and the men of scientific attainments—Orton, Lovejoy, Gorton, and Architect Loring—were a great addition to the sessions. As the effort seems to be to get architects into harmonious business communication with the clayworkers, wouldn't it be well to ask at least one prominent or willing architect from each of several of the busiest centers of the building business, say Boston, New York, Philadelphia, Chicago, etc., to become members of the N. B. M. A.? Others would follow if a few became interested, and so the Association would grow in strength and usefulness. The report, as published in the Clay-Worker, was full and complete, and to me it will bear a second and probably a third reading. The river trip and other social incidentals were grand, and the clayworkers are proud of their entertainment by the Pittsburg fraternity. Hoping for an equally successful Convention a year hence, I am,

Yours truly,

W. H. COPELAND.

Warren, Pa., March 10, 1898.

Observations of an Old Time Member.

Editor Clay-Worker:

Our Twelfth Annual Convention has come and gone. The congenial spirits there assembled have perforce again retired into private life, but they are far different from the writer if their visage does not even yet expand with barely suppressed mirth at the remembrance of incidents that occurred during that eventful week.

It was very gratifying to see so many new faces, but also regretful that so many of the "old guard" had been detained at home. I heard many expressions of regret at their absence, sympathetically wondering what had kept them away, it being generally conceded that "they couldn't help it." Morrison, Crafts, Kimbell, Hammerschmidt, Blaffer, Butterworth and many others were sadly missed by everybody; and there is not any question but that they also missed a genuine intellectual and social treat.

The Pittsburg brethren are past grand masters in the art of entertaining; forgetting nothing that would add to the enjoyment or comfort of their guests. Practically they had hung out their "shingle," "If you don't see what you wish, please ask for it." I am more than satisfied that my prophecy has come true regarding friend Dibert, as the helmsman of the committee on entertainment. McGraw—the good, genial soul—was ever on the qui vive to render a service, while Wittmer, Cawley, Albertson and the others were continuously circling in and out, ever on the alert for a nod or wink, as the case might be, from some brother needing advice, or perhaps chaperonage to 59 or thereabouts.

Our new President, Mr. Flinn, was all that could be de-

sired, filling his arduous office with a grace and tact seldom equaled. May his shadow never grow less.

I wish to congratulate the Association on the re-election of our worthy Secretary and Treasurer, men eminently fitted for their positions, leaving a feeling of security in the future of our noble Association. Let me here quote a remark I heard in the lobby: "There cannot be the slightest doubt of the beneficial influence exercised by a Convention and Association of this character."

Next to the honor of being reigning President of our Association stands the dignity of being its ex-President, to whom belongs the feelings of the pilot after successfully navigating the ship and landing her and her crew safely in the next port; feelings of pardonable pride and satisfaction.

Space will not permit of more than a passing glance through the exhibition room. There the indefatigable machine, kiln and other engineers of our business displayed their various appliances, either by model or drawings. Simpson had an elegant working outfit. The American Clay-Working Machinery Co. a splendid exhibit of brick and tile made on their machinery. The Boyd people were ably represented by the ever-present Flood, and the Chicago Machinery Co. had a dainty little model of their Berg press. MacDermott, of course, was there, showing up the Wellington machine in its best light. Charlie Stevenson (who, by the way, is the best umpire of a pool game—for the other side—I ever met) was always on deck with his pans and sewer pipe machinery under his arm. Irwin is a hummer, and, with Raymond, well represented the Dayton machines. The Ohio Ceramic Machinery Co. was ably looked after by Holl, who also exhibited a model of their new screen, as did also Elder & Dunlap; Chambers Bros. Co., Frost Manufacturing Co., Philip & McLaren, Horton Manufacturing Co., Hy Martin, "J. N. K.," Thos. Carlins' Sons and the Bonnot Co. all had their machinery in evidence by handsome catalogues, while Williams exhibited a perfect model of his shale breaker.

To those interested in the manufacture of vari-colored brick, the exhibit of the manganese product of Kendall & Flick was valuable, as showing its possibilities, while Pulsometer pumps, Bundy traps and the Leviathan belting were kept well to the front. Almost all the types of kiln in general use were represented; the Haigh Continuous, Eudaly Down-Draft, the "Peerless" Up-Draft (true to its name), the Alsip Up and Down-Draft and the Swift furnace were impersonated by model or drawings, as were the Iron Clad and Standard Dry kilns. Samples of all our clay journals were distributed profusely, including their companion in the field, the Brickbuilder.

When I arrived home I found the country covered by a thick mantle of snow, not the 'eavy, 'ard, yellow variety, so well known to Bro. Purington, but a light, fleecy, dazzling white kind, that could not possibly live in the murky atmosphere of the "City by the Lake." By the way, I noticed particularly that Bro. Gates had on either a new coat or a new button-hole in his old one, so the button-hole fiend, who is constantly worrying Gates and affording us valuable object lessons and interesting reading, can procure a fresh and I hope a lasting hold.

Sincerely hoping that we may all meet again, with considerable reinforcements, a year hence, I am as ever,

CARSON.

Kind Words for the "Steam Maker."

My Dear Mr. Randall—The extra copies of the Clay-Worker at hand. I cannot speak in too high praise of your hard work and quick execution in getting out the Convention report so soon after the close of the Convention. The task, I know, was a great one, and you have again shown yourself equal to the emergency. I realized at the Convention, more than ever, that you were the right man for the place, and the success of the minutest details at the Convention proves what I have just stated; and as a member of the N. B. M. A. I wish to thank you personally for all you did for each and every one of us,

and we all trust you will live long and be able to attend and engineer many more Conventions.

The faces of the members as they appeared in your last number are perfect reproductions, among the best I have ever seen in print. Your engraver is a good one, and deserves much credit.

With kindest wishes, and the hope that 1898 may be one of your best and most successful years, I am,

Very sincerely,

C. H. MERRICK.

Syracuse, N. Y., March 8, 1898.

Congratulations From a New Member.

My Dear Mr. Randall—I beg to acknowledge yours of March 8th, and take pleasure in sending you a photo. as requested. Though the picture is not satisfactory, it may answer your purpose.

I have attended a great many conventions, both of manufacturers and engineering societies, and I want to say that I have never seen one where there prevailed a greater spirit of good-fellowship and a more earnest attempt to bring the truth to the



J. PARKER FISKE, Boston, Mass.

front throughout the whole conduct of the convention than in the one at Pittsburg.

I was particularly pleased with the personnel of the Association, and never met a more gentlemanly, intelligent and earnest body of men. At the same time, with all their consideration of serious topics, there was a most cheerful air of good-fellowship and hearty sympathy evident among all the members.

This was my first Convention, so that I cannot compare it with others, but I feel that such meetings are of incalculable value to the craft. I was particularly impressed with the important place which scientific investigation is taking in the art of brickmaking, as evidenced by the character of the papers and the discussions.

Under the leadership of such men as Prof. Orton, who are showing to the practical man that scientific investigation has a value in everyday business, it will not be long before the mysteries and incongruities of the clayworking business disappear

in the light of true scientific knowledge of "cause and effect."

I wish to congratulate you heartily for the arrangement and execution of the most excellent programme, and only hope that the good work may continue. Very truly yours,
Boston, March 10, 1898. J. PARKER FISKE.

The Benefits of Convention Work not Confined to the Convention Hall or Convention Reports.

My Dear Mr. Randall—What are my impressions of the Convention, and what is the outlook for the future of the Association? Since becoming fully initiated into the clay industry, I had occasion to note at Buffalo many of the advantages derived by attending the National Conventions. And while the value of being in attendance was apparent to me a year ago, it was not until after my return from the Pittsburg Convention that I realized more keenly the exceptional opportunities these gatherings offer for the exchange of ideas and experience. We may read the Convention proceedings after the Convention has passed (as I myself have done), but we fail to reap the same benefit. What seems to me one of the greatest losses through failure to attend is the lack of personal contact and an opportunity to discuss topics of special interest to each individual, not only in the Convention hall, but in the lobbies and at convenient places with people who are confronted by similar difficulties or with those who are able to impart the kind of information sought. I had occasion to hear one man remark, "I feel amply repaid for coming here for the information I secured at breakfast this morning;" and from the fact that the names of so many who have attended former meetings are found enrolled at each successive one speaks only in the highest terms of the value of appearing on the scene in person.

The future outlook for the Association seems most favorable. A cursory review of the reports of the first meetings of the Association, when contrasted with those of the last few years, indicates an approach of late more toward technicality, and a more marked attempt toward reaching the solution of intricate problems. With the present outlook, and with increased interest and attendance, it is not possible to predict the capabilities of the Association; and although the Pittsburg Convention is generally conceded to be the best to date, still I look forward to each succeeding meeting as being better than its predecessor.

Sincerely yours,

E. E. GORTON.

Terra Cotta, Ill., March 9, 1898.

We Stand Corrected.

Friend Randall—I am delighted to learn that the Pittsburg meeting was a success, and that you all had a royal good time while there. I regret exceedingly my inability to be with you; I, however, explained the situation to you before the meeting. I would be very glad if you could arrange for a meeting at St. Louis. We have never met west of the river, and I believe the attendance there would be large, as it is accessible from the South, Southwest, West and Northwest and Middle States. Columbus, Ohio, would be just as convenient for me, and would be acceptable, but Ohio has had two Conventions, so I think it should be St. Louis next time. I fully expect to be there, wherever we may convene.

I received the February Clay-Worker, and have skimmed over the whole proceedings, and am now going through it right. Have not gotten far yet, and am not able to give an intelligent opinion on the various papers and discussions. However, I have read your editorials, which are always interesting. You make some statements in two of them which are, perhaps, misleading, and I wish to call your attention to them, that you may be historically correct. You are not expected to remember everything.

First, you call attention to the fact that President Flinn, at different times during the Convention, called each of the Vice-Presidents to the chair, and commented as follows: "It was a departure from former customs, and worked so admirably that it is sure to be repeated at future Conventions." If you will take trouble to glance over the proceedings of the Atlanta Convention you will find that the Vice-Presidents, Fiske, Orton and Penfield, each presided in turn during the sessions. This, I believe, was the first time in our history that the Vice-Presidents were all called upon to preside.

Again, under the caption "A Move in the Right Direction," you say: "To our minds, the most important work originated by the recent Convention was the inauguration of a campaign

of education in the matter of building brick. * * * In the Convention a committee was appointed to formulate literature to properly place before the people facts relating to the use of brick in building," etc. If you will turn to my annual address delivered at Buffalo, in the third paragraph from the last: "We can increase the demand for our product by opening new fields for our wares. We should especially try to reach the home-builders of our country and impress upon them the importance of using durable fire-proof material in the construction of their buildings. They should not sacrifice comfort and safety for mere appearance. I trust you will give due deliberation to this subject in its various phases. It might be best to refer the subject to a committee to consider and report means for the accomplishment of this object."

This is identically the same thing carried into effect. I also followed this up with articles in the Clay-Worker on the exact lines discussed in the Convention. The work outlined is of great importance, and deserves the cordial support of every brickmaker in the land. I hope to contribute my mite, and will have something further to say on the subject in subsequent issues of the Clay-Worker. Yours faithfully,

Rome, Ga., March 7, 1898.

R. B. MORRISON.

Glazed Brick.

Editor Clay-Worker:

It is perhaps unfair to take advantage of a man when he has made only a partial statement, or, rather, it may be unfair to criticise an uncompleted statement, as the article on "Glazed Brick" in the January number of the Clay-Worker unquestionably is, but permit the suggestion that the bases of that article are open to criticism; and criticism can perhaps be made without attacking the author's sincerity or grounds of information.

The essay in question would appear to be founded on a desire, plausible or censurable, as the case may be, to cheapen in price a really meritorious article, meritorious, valuable and valued "in esse;" plausible, perhaps, in so far as price is concerned, but certainly not plausible in that the quality is to be cheapened, the standard lowered, and not the best, but a distinctly inferior product placed before the public. Your correspondent acknowledges that the use of glazed brick is retarded "by the wretched quality of the so-called glazed bricks offered at lower rates," and this while seriously contemplating the use of a waste product of a buff brickyard, i. e., "off colors" and "soft brick." In this the aim to make use of waste products is undoubtedly praiseworthy, but it is the means by which that end is to be attained which is open to censure from more points than one.

The principle at stake is not commendatory, in that, instead of cultivating through all the ramifications of business the desire to produce the best and serve the best, the ambition to raise the standard of excellence in an article, which, though made for to-day, is to serve its uses for many long years, if not generations—the objective point is to produce a passably merchantable but distinctly inferior article, and why? Simply to save a certain percentage of "wasters," putting them to a bad use instead of applying them to what they properly belong—wasters—to be ground into grog and charged to the expense account of the merchantable buff brick.

The method, not may be, but must be classed as distinctly wrong, in that inferiority of clay, laxity in the processes of manufacture of the brick itself and inferiority of the materials and application of the glazing part, should not and cannot be allowed in any properly made glazed brick.

To make uses of the wasters of a front brick kiln would be simply suicidal, for the objective points in the making of a front brick and a glazed brick are two decidedly different things; for example, the term "a clean-cut, sharp arris," when applied to front brick, would not apply nor hold good in the mind of a practical enamer, for that very same term in its highest sense is an absolute necessity in the production of a glazed brick, while in the matter of fronts its use is but comparative. As a matter of fact, many of our best architects deny that mathematical regularity of surface, and with equal force, color, is desirable in a front brick, claiming, with reason, that it is not the individual brick that is to be considered, but the building as a whole, while in glazed, regularity of surface, covered well up to the sharp edge, as well as evenness in size, are positively required, together with that pre-eminent desideratum, durability. To reach these latter requirements, even in a most modest way, commensurate care must be exercised from the time the clay enters the pan until the finished ware is

stored, and less care than this is unworthy of the high stand a manufacturer should take.

The results, should your correspondent's theories be carried into execution, would probably be, first of all, "a bruised heart and a sore spirit;" after that, the producers would find themselves possessed of what has been aptly termed "a wretched quality of glazed brick," provided always it were possible to gather even such a stock, which in itself is open to question. Experiments are frequently very pretty, and always very interesting, but experiments and successful business are again two radically different things; none know this more thoroughly than the saintly martyrs who have been lured on by the ignis fatui of "successful experiments" in glazed brick. Almost every brickmaker in the land has personal acquaintance with one or more of the victims.

Another result, perhaps the most disastrous of all, is the contemplated lowering of the standard of excellence, the educating of all who come in contact with either theory or practice to accept something other than the best, simply because it is cheaper. England is said to be a nation of shopkeepers—but England is to be honored in upholding a high standard of excellence in her manufactures. America may with equal justice be said to be a nation of mercantile throat-cutters—and this is not creditable; each manufacturer seeks to produce something cheaper than his neighbor; quality is liable to be considered only so far as conditions may force; the newspapers teem with advertisements of cheap furniture, cheap groceries, cheap dry goods, etc., etc., ad nauseam, all tending to lower the moral sense of our men and boys, whether they be brickmen or statesmen, instead of leading them to observe the more honorable aim that only the best will serve. Is it not in the long run, then, better morals, better economy and better business to always strive for the best in making glazed brick, even if the soft wasters have to be ground up or consigned to the dump?

CRITIC.

Rocking Grates For Steam Boilers and Kilns.

Editor Clay-Worker:

I often think of the old "saw," "Penny wise and pound foolish," and am surprised at the breadth of its application. It might reasonably be asked, To whom does it not apply? and very naturally following comes another inquiry, Why is it so? Nobody is so foolish from choice; therefore, it must be ascribed to ignorance. The position is an unpleasant one from whichever point you view it, and yet not one of us is able to deny the double charge, viz., of ignorance and foolishness. I make no denial to the assertion that "it always was so," nor to its inseparable companion, "and it always will be;" that is, so long as human perfection remains unattainable; but I sincerely believe in the attainment of human perfection in the same ratio and on the same lines as the divisibility of matter. For example, you may cut a brick in half and throw one half away, then cut the other in halves and throw one half away, and go on repeating this, throwing one half away at each division made. Theoretically, your task will never be accomplished; although you approach the goal by halves each step, there will always remain a half to divide. So it is with human perfection; its approaches are made in fractions of the remaining whole, and on these lines you will easily perceive it parallels eternity.

Descending now to practical matters, we will visit one of our Philadelphia brickyards. The owner is known in the neighborhood as a very decent and respectable man, close, but just, strict with his men as to the amount of work expected from them; at the yard when the whistle blows in the morning, and there after it has blown at night; has his horses kept in good trim; drives a close bargain with the operative builder who buys his bricks, and in many respects is a model brickyard economist. But he, like the rest of us, is far from the perfection mark. He will stickle a great deal over ten cents a thousand with a customer, but unwittingly waste twenty cents a thousand in the kilns and under the boilers by crude and wasteful methods of burning fuel. He will storm and rave over a bearing screeching for oil, but will allow a line shaft running on the floor-level to be covered with clay to a depth of sixteen or eighteen inches, thus running in a clay bearing four or five feet long. Now, you could not spring a greater surprise on him than by coolly and quietly asking how much coal was being burnt at that point. The question would probably arouse in his mind some idea of the power it requires to overcome the friction of such a large clay brake, and that his engine was furnishing that power by using more steam, and thus he would be led to see it required extra coal to produce the extra steam needed to overcome useless, nay, worse than useless friction. This is not all. We find the shafting out of line and "limping" like a man with one leg a

little shorter than the other. This and other defective mechanism causes a tendency of the belting to slip off the pulley on one side, but this is easily remedied—a board or a scantling is fixed to hold it (the belt) in place; the consequence is a rapid wearing of the belt to a ragged edge, and some more useless and destructive friction to overcome, all requiring the burning of extra fuel.

Proceeding now to the kilns, we find one nearly at full heat. The burner and his man are firing up. The grates, of course, like the majority in Philadelphia, reach nearly to the center of the kiln and are about twelve feet long. Each fire receives from ten to eighteen shovelfuls of coal, the door wide open all the time, the cold air rushing in and producing a most decided black cooling of the exposed bricks.

Notwithstanding the abandonment of the long grate by engineers, the brickmakers still think they are essential in the old Dutch kiln, and they reiterate the statement, "It stands to common sense that the nearer the middle you push the fire the better chance you get to burn all the kiln alike." True, it looks that way; but if you look at an object through a telescope it appears to be maybe twenty times nearer than it really is, whereas, if you reverse it and look through it from the other end, it will appear twenty times farther away than it really is. So you see it all depends on the point of view from which we look at things. If we burn coal, or any other kind of fuel, from a common sense point of view we are apt to be very much mistaken, but if we take our view from the teachings of science, we obtain the highest practical results. The abandonment of long grates was the result of scientific investigation, and the continuance of them can only be attributed to lack of scientific training and knowledge. The coaling and cleaning of the long kiln grates is a source of great loss or waste, not of fuel only, but of the material being heated. When producer gas was introduced into rolling mills, the waste of iron in the heating furnace was reduced from 10 or 12 per cent. to 2 per cent. In the puddling furnace the gain was still more marked; the loss, which had been 12 to 14 per cent., was reduced to nil, and in some cases there was an actual gain of a few pounds of iron over what was charged in. The saving in fuel, although over 55 per cent., was only of secondary importance. The saving in wear and tear of furnace was also an item of too much importance to be overlooked.

The above examples have been cited more than once in the Clay-Worker, and are here repeated to emphasize the importance of burning coal in a proper and scientific manner. My very much esteemed old friend and opponent, Captain Craft, has more than once shown my Philadelphia brethren how he burns bricks with half the fuel they use, and confirms the teachings of science by using short grates, and these outside his kiln, too, in portable furnaces. It is a mistake to have the fuel in contact with bricks or other clay products. It is also a mistake to have a great influx of cold air while firing and cleaning the grate; the reduction of temperature from the fuel alone is a great drawback, but when supplemented by a large volume of cold air, it denotes a barbaric system of using fuel.

While writing this I received by mail what is very fittingly described a "very wicked circular," which is, to say the least, very amusing and instructive. It is from the United States Rocking Grate Bar Co., Chicago, and, from what I can learn, this grate is filling some large leak-holes in the economy of fuel burning. I am not aware of its application to the brick kiln as yet, but I fail to see a reason why it should not be. I am practically certain, if it is as economical in the boiler and other furnaces as reported, it will be equally so in the brick kiln furnace. The advantages of a well-designed rocking grate are to obviate the necessity of opening the fire-hole door while cleaning the grate, and to greatly diminish the most disagreeable portion of hand firing, while at the same time fuel and the material under operation are being saved. There really is no necessity to open doors for firing, and the rocking grate bar ought at once to be supplemented with a feeding device that will drop into the furnace a charge of coal without admitting cold air. This much accomplished, the results will certainly be an increase in the number of good bricks, and a decrease in the quantity of coal required to burn them, less work for the burner, and the burning done in less time, because the heat now is on a constant rise, which before was set back several hundred degrees every time firing and cleaning occurred.

His Satanic Majesty who delivered the lecture contained in the "wicked circular" above named advises his hearers to let all the air admitted to the fire go up through it from the bottom, and further says, "I always have to laugh at your 'patent furnaces,' most of which take air over the fire." Now, as an old man, who naturally cannot much longer serve His Majesty on earth, I must be cautious about picking a quarrel with my master, who may possibly need a gas producer in the near future to roast boodle aldermen, which, of course, will need a large set of rocking grates. I think his mind reverted to a gas producer when he advised sending all the air up the grate, for that is the proper

thing; but for furnace grates—er—er—I think—well, I think if he is right I am certainly wrong, and if he will come up and spend a few minutes in the Clay-Worker sanctum (I wonder if he is welcome there?) and state in writing for the benefit of all readers of the Clay-Worker just how perfect combustion is accomplished by that method of admitting the air, it may carry more conviction than his mere laugh. However, the circular is full of good information, and those who have not got one ought to send for one. I believe they are free.

WILLIAM WAPLINGTON.

"Right Wrong" in Burning Brick.*

Editor Clay-Worker:

Through your kindness I will be pleased to call the attention of your readers to a matter in burning brick that has been largely overlooked. In attempting to do this I am not sure I shall be able to make myself clearly understood without drawings. But to those interested in burning clay goods the subject will prove interesting. My subject, then, is doing important things "right wrong." This contradictory expression is used to emphasize the fact that the wrong way is employed in doing a given thing, and as I hope to show both the right and the wrong way of drying off and burning brick in down-draft kilns, these words will serve as leaders in each case.

In order to understand and appreciate the "right" way I will first describe the "wrong" way, the present way, in general use. The wrong way is by one or both of the following methods, viz., by slow fires in the numerous furnaces, the heat passing up through the bags and down through the brick or by hot air from a cooling kiln introduced through the crown of the kiln to be dried off and heated up. Both these methods as now applied are "right wrong." By an important law heat attracts heat and draft shuns moisture, dampness and cold. Now, heat and draft are the chief agents in drying off and heating off a kiln of brick. Heat will not readily go where there is no draft and draft is greatly retarded by moisture. Remember our subject is drying off and burning brick in down-draft kilns. I need hardly say such kilns are indispensable in the proper burning of paving and fine front brick. The "wrong" is not in the down-draft principle, but the construction and the mode of applying the heat to the material to be burned. That we may see the "wrong" in the present method, let me explain it and the results which follow.

We start fire in the furnaces. The heat passes up through the "bags" and meets under the crown and must descend through the brick to the draft flue under the kiln floors. At first the openings between the brick are open, but the flues and exits are cold and repel draft. The heat from the furnaces acting on the top brick produce moisture or water smoke. This must descend through the brick, and as it descends it comes in contact with cold brick. This condenses the moisture and it forms on the under brick in drops of water. The moisture in connection with the steam not condensed forms almost a complete barrier in the underground exit flues. Hence the more heat for a time on the top brick, the more moisture is discharged on the under brick and the more is the draft obstructed and the heat held on the top brick, where it is least required.

Now, after the process has gone on till the top brick are a cherry red, we find the middle brick only dried off and the bottom brick have more moisture in them than when the fires were started. But the process must be continued. Briefly, the results are that by the time middle brick are burned properly the top brick are burned twice, and by the time the bottom brick are properly burned the middle brick are burned twice and the top brick three times. Hence, we have the bottom once, the middle twice and the top three times, which equals six times, just double what it should be, hence to that extent double what it should be in the matter of fuel used, to say nothing of the damaging effect on the brick which are burned too much. The same obstruction to draft and the same bad effects on the brick occur when heat from a cooling kiln is introduced through the crown, and so we need not say anything more about this method.

We will now describe the "right" way, which is drying off and heating up by the up draft, and that with the waste heat from a burning kiln, and then when the burning proper commences by down draft we have a hot bottom to draw the heat

from the crown. The advantages of this system are at least three-fold. First, immense saving of fuel; second, exemption from overburning of a part; third, increased draft and equalization of the draft in the kiln.

The natural tendency of heat and vapor is to rise, and it is well to take advantage of this principle in drying off and heating up by the up-draft, and that with the waste heat. Therefore, the "right way" is to introduce your heat and air for drying off at the bottom of the kiln and under the mass of brick to be treated. We have seen that the old method of brick burning by applying the heat to the top brick first, and thence downward defeats in a large measure the object sought by choking up the draft by a cloud of moisture and a cold, damp bottom flue. We have also seen that this old way softens the bottom brick, and they are liable to become unshapely by reason of the weight of the other brick over them. Now, to obviate all these objections and save nearly half the fuel used in the old way, we connect the center flues of a series of kilns with transverse flues so that the heat from a burning kiln is discharged under the floor of a kiln of brick which are to be dried off and heated up. Then by means of a forced or suction draft the moisture is taken out at the crown. This with the superior force of an up-draft, aided by the suction principle mentioned, we discharge the moisture outside the kiln as fast as eliminated from the brick. This prevents the condensation of moisture on the brick furthest from the heat and so prevents them from becoming soft and unshapely. It will be seen that the bottom brick, which have to bear the weight of all above them, dry first and this strengthens them to bear this weight. The only brick which can be affected, if any, are the top brick, which have little or no weight to carry. In order to have the full benefit of this system of treating two kilns by one set of fires the center flue must be of special form. This will be best understood by referring, first, to the old or ordinary center flues. These may be described as a flue lengthwise of the kiln and under the floor or bottom of the kiln. It has two solid sides and about half of upper square arched to support the kiln floor. The other half of the top is open to admit the vapor smoke, etc., to the box or flue and so be conveyed to the stack. Such a flue would make a good conduit for water, as the water, by reason of its gravity, would enter the openings and hug the bottom and so pass along, but heated air has no gravity and will not descend into this trough unless forced into it by some pressure. This is only had by filling the body of the kiln with heat pressure, which forces a part of its accumulating self into this chamber.

Another serious objection to this old style center flue, especially when drying off, is that it is directly under the center of the crown of the kiln. So when heat is introduced through the crown of the kiln from a cooling kiln or discharged into the bags it meets directly over the center flue and so the heat and air acts chiefly on the brick in the central part of the kiln, leaving the brick in the sides comparatively unheated, and thus the center of the kiln will be dried off and heated up first, and as the heat is increased in the furnaces this hot center will draw the heat to itself and continue to rob the sides of the kiln, where it is most needed. All this is "right wrong." We are now ready to hear of the "right way" and one that will overcome the numerous objections to the present system.

We have said that in ordinary center flues the heat enters these flues through openings in their crown or arch. We have also seen this defeats draft and what draft there is chiefly at the ends of such flues nearest the stack, and hence the drafts in the kiln are unequal, and to such an extent is this the case that the furnaces near the end of the kiln have to be held back so that the middle may catch up. Now, to overcome this and give a uniform draft in all parts of the kiln and for other purposes we construct our center flue with a tight crown, the entrances to this flue or tunnel are through numerous openings in the side walls of the flue near the bottom of said walls, or if preferred under these walls. These center flues connect with outside transverse flues, so that the heat from any one of these series of kilns, which is being burned by down draft, can be discharged under a kiln of green brick to be water smoked by up-draft. These openings into the center flue may be regarded as port holes, through which the heat from a burning kiln enters the flue and in the kiln being dried off the heat is discharged through these port holes, right and left under the mass of brick to be dried. This thing of drying off and heating up the bottoms of the kilns by the up-draft before the burning proper by down-draft commences, is of much greater importance than the fuel it saves, large as that is. This will be highly appreciated by practical burners. When you have your underground flues and your bottom brick heated up by up-draft and you commence burning by the down-draft and you increase your heat, you have a draft at the bottom of your kiln to draw the heat down through the brick and prevent that excessive accumulation on the top and under the crown. In burning paving brick the wear and tear on kilns

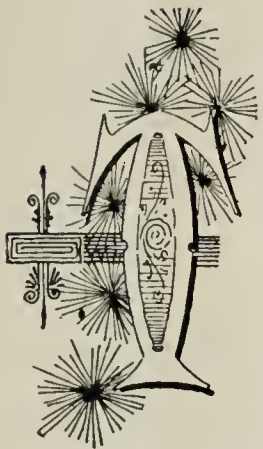
(*This communication was received prior to the Pittsburgh Convention, hence should not be considered as a reply to Mr. Alsip's paper on "The Use of Heat from Cooling Kilns."—Ed.)

is very great, and this is especially so on the crowns, and this extra strain on the crowns arises from the fact that you lack draft to draw heat from the crown, and this lack of draft arises largely from the shape of the center flue, and that causes your bottoms to be the coldest part of the kiln. By our system of burning one set of burners virtually attends to two kilns at the same time, the kiln being dried off needing no attention till the down-draft kiln is finished and closed up. It will thus be seen we have always two kilns at least under the effect of the heat of one set of furnaces. The saving in labor added to the saving in fuel by reason of using the heat twice should commend itself to every brickmaker. I need not call the attention of practical brickmakers to the great importance of good burners. This is the finishing touch and either makes all that has gone before good or spoils all or a part. A salmon brick, which in some markets sell for \$3 per M, cost as much to make as the well-burned brick which brings \$6 per M. In making common building brick the effects of bad burning are not so keenly felt as in making paving brick. The manufacturer of paving brick who can only get out of his kiln 65 per cent. of good brick and has no paying market for the other 35 per cent. of imperfectly burned brick will soon find his business unprofitable. The importance of every brick being burned well in cases where brick have to be shipped by rail or otherwise is very manifest, as the freight on poor brick is the same as on the good, but it is very seldom that the price is the same, and if it is the price has been molded by the consideration of the poor brick in the lot. In describing the "right way" to burn brick in down-draft kilns I have (in order to be understood) been obliged to describe to some extent a recent patented device on mode of construction of kilns, which was designed to overcome the enormous waste of heat and fuel in the old method. I am ready to try to answer any questions of brother brickmakers if further information is desired.

Minneapolis, Minn.

J. K. CALDWELL.

THE NEW YORK MARKET.



THE LAST DAY of February, with weather to the queen's taste, with all indications of an early spring; in fact, the bluebirds and robins have been around the past three weeks. No snow on the ground or frost in the ground, except in some shady places. The Hackensack river is open; along the shore is seen thin ice, which gathers during the night, but disappears before the sunshine of the next day. For outdoor work the conditions are very favorable.

The brickmakers are making no preparations as yet to pump the clay holes, although it will require in some cases nearly three weeks of steady work night and day to remove the water. Three years ago there was more activity at this season toward getting ready than at present, with rates below the present ones. A day may make them start out to get ready, and then all will begin the season of 1898, not with the confidence that prevailed when last I wrote, that the market was theirs. Then brick were on the raise, and the indications were that the supply on hand would be used up, or nearly so, before new brick were on the market. A marked change has come over their dreams in the past month. The facts have appeared to them that the ebb tide of the brick trade had not all run out. The common expression among the trade is, that they do not know what to do at present, whether to ship or hold; that is, those who can hold. The idea among many is that before new brick reaches the market in any great numbers the best prices will be obtained, and there are many who argue the complications which may arise through the explosion of the "Maine" may seriously hamper the building operations—if so, the best policy is to realize now.

Easy money is a factor which helps the builder as well as the trade. As Wall street the past week rather indicates a close market, the speculative building will not reach the expected size many looked for. About the first of the year I do not think you could have found anyone who manufactured brick but would have made the assertion that this season would be a good one for the brickmaker. Two months of the three best for issuing permits for new buildings show a falling off from the same time in '97. It takes but little to cause a prospective builder to hold off for another six months or a year, "till the clouds roll by." Not so the brickmaker; he will make and he will ship and at a time when he has to take the lowest rates of the year. On one of the yards here the first of the year there was not four hundred thousand brick of the

make of '97. When the last kiln was being burned there were not twenty arches under the shed, when there was over a dollar more per thousand in sight than the brick shipped had brought. It was not the only pebble on the beach of the brick-making strand.

—Shipping Brick—

Has been resumed as far up the Hudson as Newburgh. Hackensack is sending sail boats as well as barges in the hope that they will reach market before the others get there. On the 24th of this month one of the barges was being loaded. I asked the brickmaker what he thought they would bring. "Without a doubt, \$5.87½," was his reply. The next day he went to the city and sold the cargo. When next I met him I asked him if he sold the cargo. "Yes," he said. "How much?" "\$5.75, and lucky to get that." The week before the same brick would have brought over \$6. "What do you think they will bring when that fleet from Haverstraw comes on the market?" he said. "What fleet?" I asked. "Why," he said, "one day this week there was a tow of thirty barges went to Haverstraw and they will all strike the market at one time, and down will go the price. I think mine have sold well." The brickmakers of Kingston and above that point to Albany will think it was a dream, that in February brick by the cargo in New York market brought \$6.50 per thousand. The first cargo they will ship will probably sell for less than \$5; as most of the barges which belong on the upper Hudson are in New Jersey during the winter, it gives the Haverstraw bay yards a chance to get extra boats, which they are doing, each and all trying their best to knock the market down. How well they will succeed it will not take many days to show.

—Shipping Clay.—

About five years ago I said that when the clay in the banks was exhausted the river front would provide unlimited quantities of the best blue clay. The coming summer preparations will be made to take it out of the river, probably by steam dredge, as it is to be transported by water about three miles. About sixteen years ago in the south part of town a large coffer-dam was built to exclude the water so that a bank was opened where the water formerly was, thereby opening a fine body of clay. The body now spoken of is just in front of the main part of the town and on it is the foundry used for many years for the manufacture of the Vervalen brick machine, as well as a fine house with a dock front of about four hundred feet, with coal sheds. Also other buildings to carry on the coal and lumber business for which it was used many years. Along with the property above water there is a water grant which extends out into the river about fifteen hundred feet. The purchasers, Messrs. George and Frank Felter, bought some years ago property at Grassy Point, on which the clay was all worked up, so it was said. It had been in the market for years. After it was sold, in conversation with Mr. Uriah Washburn, who had made brick on the property, in fact, with his brother built the first yard on it, he said to me, "I am sorry I did not buy it, as there is sand on it to the value of what they paid for it, which I think was ten thousand dollars." The Felter brothers stripped off some of the top stuff and found clay which in former years had been left, for the brickmakers would sink a small hole and then fill it up with the screenings of sand; the result was that they had clay for several years for the two yards which were on the property. They then bought a piece of clay land, which will be used up this season. This had to be carted over a mile. The property which they have just bought will be valuable as a factory site. As they take out the clay it will deepen the water so that vessels of any draught will be able to discharge cargo at the dock. The price paid is small, only eight thousand dollars; the dwelling house on it cost almost that much to build it. At present they have no definite plans as regards the carrying of the clay, but the impression is that they will use two or more boats with flush deck, so that when the clay and water is dumped on it, the water will run overboard and the clay will dry off. It seems that for advanced ideas it requires men who were not brought up in the making of brick. The Felter brothers were farm raised, and never worked on a brickyard.

—Brick Trust.—

What, that old chestnut again? Yes, and this one has the money to carry it through, as nearly as close inquiry can develop. The parties who are behind this movement propose to take in all branches of the trade, if they succeed in securing the number of properties they require. It is not their intention to acquire all, but if the prices suit, no doubt would take all. Sixty-five or seventy per cent. of all the Hudson river yards is what they are after for a starter. I am informed that they do not want any of the Verplank Point yards. It may or may not be so.

Inspection of the different properties by the agents has been

going on in regard to the quantity of clay and sand on each property from Haverstraw to Albany.

The number of owners of property in Haverstraw for the number of yards is small; seventeen in all covers the whole distance from Stony Point to the south part of the town of Haverstraw. Six operate the yards on their own land, the rest under lease.

It is proposed to purchase leases from the holders so that full control will be in their hands, so that the matter of supply will be in their own power. Options have been furnished to all the owners to fill out with the price asked for their land and fixtures. The largest clay property with ten yards on it in Haverstraw has given the organization their price, as well as others. In Newburgh Bay, that is, New Windsor and Fishkill, all but two, so the report is, have placed a price on their property, the two being Mr. Edwin Brockway and the Rose plant at Roseton, with one of the heirs willing to sell, but the other two brothers and sisters are not in favor of selling; as that plant turns out about forty million each year it would help along.

Who are the parties? That is the question. Each has a theory of who are behind the movement. The Central Trust Company of New York City is the financial agent in the deal. With it, is supposed by many, are parties to furnish the money, and they have made their pile by the product of something to burn, the Standard Oil Company. Last fall the Standard Oil Company burned a kiln on the Rose brick plant at Roseton and took all the agents of the brick trade on a boat and stopped at Haverstraw for all who wished to enjoy a sail and see the method of burning which they were trying to introduce with the use of oil. Later in the season they burned two kilns on the Scott & Rowan yards in Haverstraw where all could see the process, and I have failed as yet to find anyone but says that the brick were well burned out and of good color. A short time after the idea of a trust was started. There is no doubt whatever but that they have the money to buy with as well as the nerve to push it to a paying basis. If the prices asked are too high, and they have made up their minds that they mean to have the trade, some of the large land-holders will get their price so that they can get a hold, and then the fun will begin.

—Money Talks.—

Cash is what talks in this case—clear, cold cash—no taking part stock or all stock, but, what is your figure, and if satisfactory, here you are, money down. It certainly is different from other syndicates and all other movements which have been brought out before. The report is that they have twenty-seven million of dollars to use in buying. It seems a very large sum of money—so are the number of properties from Haverstraw to Albany.

A basis of value would be hard to establish, as a man with that amount of money would consider 3 per cent. a fair return for him. A man who owns a piece of property which has four yards on it and makes, say, thirty million a year, at sixty cents per thousand rent or eighteen thousand a year income. If he could sell he would certainly get enough to produce the same return of money at 6 per cent. or three hundred thousand dollars. If less per cent., more money. It would not take many pieces of property to make a hole in that pile.

It seems to be the intention to do all their own towing and sell their own brick. As the product of the Hudson river amounts to about eight hundred million annually and the rate of commission for selling is, say 12½ per cent., there is a large return in that, and with the introduction of oil and the gradual cutting here and there, the returns will be well paying. Some are hoping that it will go through, while others do not know what to do.

At present they do not want any Hackensack or South River yards. Will they even want them? If they get a hold on the Hudson, the Jerseyman will get a squeezing as regards prices

which will make him think he is being run through a double pressure brick machine.

—The Market—

Has been a closed one, with the exception of such barges as were under cover in New York, as the last cold snap shut off the river brick, but there were enough in market to keep them going. While the river was closed the ruling price was from \$6.12½ to \$6.50, and, as stated before, \$5.75 for Hackensack for the first load and the prospects of a large arrival will no doubt drop the market.

From January first to date number of permits for the year to February 25th is 444. Same date last year 565, cost \$13,685,350; this year, \$11,864,475.

Brooklyn last year, same length of time, number, 390; cost, \$1,464,392; this year, number, 439; cost, \$1,996,221. If these figures do not mean low prices for the future, the past will be no criterion to go by.

A. N. OLDTIMER.

Hackensack, N. J., March 5, 1898.

Kept at Home by a Disastrous Fire.

T. A. Randall, Secretary:

The writer had expected to attend the meeting of the National Brick Manufacturers' Association, but on arriving home on the morning of the 15th found one of our plants partly destroyed by fire, viz.: the Whitmore, Robinson and Co.'s plant, with a loss of about \$25,000. After this disaster the writer's time was required at home, and he could not see his way clear to attend this meeting. I hope the meeting has been a very successful one and that all have had a pleasant time. I am only sorry that I could not be with this body and have seen all their faces once more. Enclosed find my check for \$2, my fees for a year. If there are any other charges I should be glad to pay same. Hoping that you will send me one of your badges, and with best regards, I am,

Yours very truly,

H. B. MANTON, Sec'y,

Akron, O., Feb. 18, 1898.

The Crown Fire Clay Co.

OBITUARY.

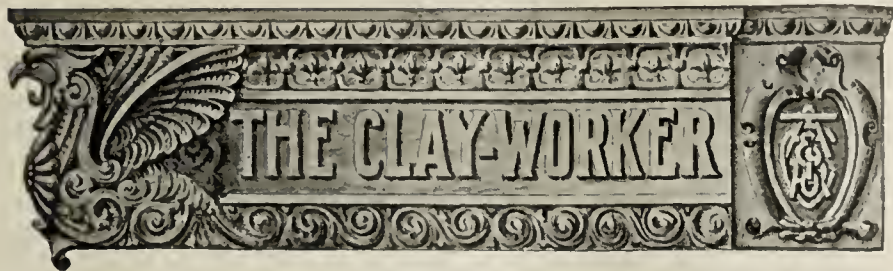
William H. Bennett, of Wellington, Ohio, died of pneumonia March 8th, aged seventy-one years. He was one of the original members of the firm of Bennett Bros. & Co., the predecessors of the Wellington Machine Company, and retired from active business on the formation of the present company. For years he was a manufacturer of brick and a builder, and was one of the pioneers in the introduction of brick machinery in the early days, before its use had become general. He was the father of H. S. Bennett, and brother of F. W. Bennett, officers of the present company.

* * *

We are advised of the death of Mr. Elston H. Lonsdale, which occurred at Ashley, Mo., on the 7th inst. In former years Mr. Lonsdale was a contributor to our reading columns. He resided in Iowa for a time, and was connected with the Geological Survey of that State, and afterward took up similar work in Missouri. He was born at Columbia, Mo., January 22, 1868. He was a bright, ambitious young man, and his untimely death is to be deplored.

A HANDSOME BOOK.

A very handsome little volume has recently been issued by the City of Atlanta. It describes and illustrates in a very attractive manner the many advantages of the Gate City of the South. Commercial, manufacturing and residential conditions are exhaustively discussed. The book contains more than one hundred beautiful half-tone engravings, showing street scenes, public buildings, factories, etc. Being issued jointly by the Atlanta Chamber of Commerce and the City Council, the book is authoritative and free from individual advertisements. It is one of the most elaborate and attractive publications ever issued for general distribution. The book will be mailed, without cost, upon application to Mr. V. V. Bullock, Secretary Chamber of Commerce, Atlanta, Ga.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXIX.

MARCH, 1898.

No 3.

CURRENT COMMENT.

Everyone is asking, "Will war affect your business or mine?" particularly "mine." Certainly it would stimulate the industries and make a market for much that is now without a market—give employment to many who have been out of employment—make new buildings necessary, and make a market for brick. This certainly is logical.

* * *

This is a good time to organize, brickmakers, and by concerted action place your business on a paying basis. There is a tendency toward better prices in all things. An advance in the price of brick of a dollar or two per thousand means little to the consumer, but much to the manufacturer. The brickmakers in every locality should get together and work for, not against each other.

* * *

The New York Times is authority for saying that the money which has kept the patriotic Cubans in the field against the Spanish troops has been contributed through the agency of cigarmakers in New York, Chicago and other cities. They have contributed largely themselves, besides acting as collecting agents. It is estimated that their contributions have amounted to only about \$2,000,000, while the Spanish cost of the war has been more than \$200,000,000, and that the supply of the latter is practically exhausted, while the cigarmakers still know where and how to get money. We know several brickmakers who are contributing more than a fair share.

* * *

An architect of this city was looking about for a low-cost method of changing the monotony of life in a red-brick town, and he came to think of the light-colored Milwaukee brick. The freight from Milwaukee is about \$3 a thousand, which brings it into Indianapolis at about \$9 or \$9.50 per thousand—certainly a low price to bring brick such a long distance. Thus to-day, through low freight rates, the world becomes small.

Both the architect and the client would have thought quite as much of the brick, however, if they had had to pay \$2 or \$3 a thousand more. In fact, the architect tells us that he did not allow his client to know what they would cost him until he had made up his mind he wanted them; then he was doubly pleased by the brick and the price offered.

* * *

Our student readers, old and young alike, will find Mr. Richardson's address, under the head "A Brickmaker's Education," on a preceding page, very interesting. After a careful perusal, the reader will understand why Mr. Richardson is an ardent advocate of Prof. Orton's School for Clayworkers.

* * *

The first-page matter in this issue is of particular interest. The New York Herald Building is one of the great buildings of that city, yet it is not a tall building. We Americans are disposed to look upon greatness in building in these modern times as having only to do with height. The New York Herald Building disturbs this sentiment. Here a two-story structure, in the midst of tall buildings, is one of the most interesting structures in New York City. It is interesting because of its artistic merits—not its size. True, it is an absolute reproduction of an Italian structure of the Renaissance. But it is the Renaissance faithfully reproduced; the outline is pleasing, otherwise it would not have been selected—but the detail is masterly.

* * *

This is a notable instance where terra cotta has readily fulfilled its mission in bringing to us the possibility of accurate reproduction of classic profiles and details, at a moderate cost. In stone this work would have been so difficult as to be almost impossible with us, who have not a large number of sculptors who are familiar with the chisel. Under any circumstances, the work would have had to be modeled in clay and cast in plaster before it could have been cut properly in stone; thus it is that terra cotta work is a first-hand process; the modeling and casting does away with laborious and expensive stone-cutting. It is terra cotta which is largely responsible for our revival of the Renaissance of the fifteenth and sixteenth centuries.

CONTRACTORS' TROUBLES.

We publish a synopsis of a Wisconsin decision relating to the matter of inspection of work by architects and superintendents. Now, anyone who knows anything about contractors' troubles—and their lives are not spent in a bed of roses—knows that settlements develop the unexpected. Things may go smooth enough until the time of settlement comes; then the architect and his client unite in hunting trouble for the contractor. Defects are brought out which were never mentioned before, and altogether there is a general search for anything which may force a settlement favorable to the owner. Nothing is too small to be brought out—they even get down to flyspecks. The Wisconsin decision has something to say about this. It is that failure to express dissatisfaction as the work progressed may be fairly interpreted as acceptance, and such acceptance must be final and irrevocable. If the owner failed at times to inspect the work, he must be bound, notwithstanding it may have been to his loss, by the acquiescence of the architect who represented him. We would advise contractors to call the attention of their attorneys to this decision, and we believe through its application much trouble will be saved.

LOCAL ORGANIZATION.

Organization or co-operation in the matter of the manufacture and sale of brick is becoming an absolute necessity. It is not a wise prophet who fixes the time for the realization of his prophecy, nor does it require any great wisdom to be able to affirm that combination, organization, or whatever one may call it, must be. The delay in realization is brought about, no doubt, by the feeling that everyone would like to manage his

own business, but in time that sentiment must succumb to the more practical consideration of self-interest. Local organization is meeting with success; it is local organization that is greatly needed; it is local organization that will measurably affect prices and profits. It is right that everyone in business should make a fair profit. It is right that the brickmakers should make a fair profit. It reacts on the capitalist, the general community interest—it helps the groceryman, the general merchant and the worker; it is a matter of community interest and benefit, and a question of a dollar or two on brick will not keep anyone from building if he really wants to do the work. Anyone will buy brick just as cheaply as he can, but he will pay what he has to, and he thinks just as much of the man he buys it from at a higher price as at a low price—probably more; he will think more of his building, and he will think more of himself.

THE GERMAN ASSOCIATION TOPICS.

We know that our readers will be interested in a list of topics considered at the meeting of the German Brickmakers' Association, held during February, which is given on another page. While their topics may not serve as a model for us, yet in them there is a lesson and a suggestion. For instance, one question is, "Has the Cummer dryer proven a success for clay from the bank, and what is its capacity?" Here we find a distinct discussion of a particular machine and method. Other parts of the programme show the same methods. It shows a disposition to particularize, to discuss in open convention the merits of different machines and devices. We wonder what would happen if such a thing were to come about in one of our meetings. Several things might happen—some of the members would accuse those having in charge the programme of undertaking to advertise a particular machine. Then it is quite possible that those having in charge that particular machine would stock the Convention with three or four people who would have nothing but favorable things to say about it. On the other hand, the competitors of that machine might stock the Convention from another point of view; so that, taking it all in all, we would probably have a "monkey and parrot" time—a good deal of talk—a good deal of misinformation, well saturated with the genuine article, yet all but impossible of analysis. However, here is something to think about.

THE QUESTION OF THE HOUR.

At no time for a hundred years has the war cloud been more portentous over the whole earth than now, though there is an absence of actual hostilities. There is at the hour of this writing no actual fighting anywhere worth naming, but nearly everywhere there are political complications which may lead to battles in less than a month between some of the most powerful nations. What most concerns the readers of the Clay-Worker is our own relations to these conditions. Nothing has occurred yet to change the views published more than a year ago as to so much of this universal unrest as immediately belongs to us. Cuba is to be free, but in the processes which are to lead to this we must inevitably be involved in war with Spain. Just how this is to be no one is wise enough to forecast. It may come through questions arising out of the destruction of the Maine, or it may come through our charitable purpose to feed the starving Cubans through private aid carried to them in government ships, but come it must, in the nature of things. It would not necessarily come if the rulers of Spain ruled. Those in official authority are not the real rulers of the state. With Spain, more than with any other nation, the power behind the throne is greater than the throne itself, and that power with her is the unthinking rabble. These demand blood in their mad ignorance of the real conditions which environ them. Diplomacy could easily settle all the differences between us now, or likely to be, if it were not for the clamors of the unwashed rabble for war.

Of course, every loyal American believes that war could end only in one way—the acknowledgment of our national superiority. But whoever thinks it would be a gala-day sport is mistaken. Though old and imbecile, and evidently nearing its end, Spain is formidable, and can and will strike many a heavy blow; but that cannot be helped now. We are preparing to receive all her blows in a becoming manner. And, after all, the shaking up which the mere preparing for the worst has given us is not without its benefits. It has brought out what was not so well known before—the unity of the nation. We may prod each other unmercifully on local economic questions, but when an outsider shakes his fist at us, we are a unit as against him, and though we may dispute among ourselves as to the relative value of silver and gold and greenbacks, we find it very convenient to have a few spare millions of universal money on hand when we have to buy warships abroad. So the war scare, if it shall prove nothing else, has not been without good results. It has demonstrated another thing. We have a million of men ready and anxious to enlist as captains and majors and colonels. We have heard of none who care to go in any less rank than captain, while a few thousand would prefer to be generals at the start, rather than captains.

Let our readers be patient. Hostilities may be postponed, if not averted. But one thing is certain—there is to be a good demand for brick this summer at fair but not extravagant prices, and he who has a good article will be the first to sell and command the best price. If you need to enlarge your plant to meet increasing demand, consult the advertising columns of the Clay-Worker when you want to put in new and improved machinery, for the best always advertise. And never fail to read the valuable articles which appear from month to month on how to make better brick and sell at better prices.

BRICK IN BOSTON.

Boston rejected the gift of the Bacchante—the immortal work of a great American sculptor—and it went to a more appreciative city. It is now in the Metropolitan Museum in New York. In excuse for the attitude of Boston in this matter a prominent citizen said: "But you must remember that Boston is very conservative." We told him that kind of conservatism would lead an ostrich to stick his head in the sand. Later we asked the same gentleman why it was that they used so much granite and stone and so little brick in their principal buildings. "You must remember that Boston is very conservative," he said. "Does the conservative mind never learn anything?" we asked. "Does not this conservative mind remember that it was the granite and the stone structures which made the great Boston fire possible? Do you not remember the granite popping from the buildings, flying across the streets, so that it was impossible to even attack the fire in many sections? Do you not remember that the same thing happened at the second fire, when the Globe Theater was destroyed? Do you not call to mind that another fire in the wholesale district, which included the destruction of a building owned by the Ames estate, was caused by the burning of a wholesale clothing house, the first two stories of which were supported on iron pillars surrounded by granite facings? Surely, Boston is conservative." One sees new buildings just finished in Boston with iron pillars surrounded by stone, where the material in the show windows is sufficient to destroy the pier and dump the front of the structure into the street. This is a wonderful conservatism. Burn your hand and burn it again! Continue to stick it into the fire, but above all be conservative. Don't change your habits. Continue to use granite and stone, and ere long we will again be called to chronicle a disastrous fire in Boston.

Those of our readers who turn first to our advertising pages, leaving the reading pages for after-consideration (and there are many of them), will find an unusual amount of interesting matter in this issue. They will find among the ads. several new names, while a large number of old and familiar ones appear in new dress. He who is looking for anything in the way of improved machinery or appliances for use about clayworking establishments of any sort has poor eyes if he cannot find what he wants between the covers of this issue.

WE BOW TO HIM.

I.

How Livingston once disappeared in darkest Africa,
How Stanley hunted after him, exploring near and far;
How Columbus found America, not thinking so to do,
And how the friends of Ericsson proclaimed he did it too.
You have read.

But there's a hero who till now has lacked historic care—
The hero who each year starts up his brickyard on full fare,
Exploring for a profit that he tells you is not there,
Be it said.

II.

How Leander went in swimming in the chilly Hellespont,
How Jacob farmed for Laban fourteen years successively,
How Copetua begged a beggar maid she wouldn't answer
"won't,"

And Orpheus went straight to—well, to find Eurydice,
You have read.

But the hero whose devotion really ought to have the floor
Is the hero whose devotion has no record heretofore—
He's the man who runs a brickyard for pure love and nothing
more,

Be it said.

III.

How Yenghis Khan once overran all Chinaland to Peking,
How William stubbed his royal toe and grabbed the British Isle,
How Alexander for more worlds to conquer went a-weeping,
And Chaka taught his Zulus how to do a foe in style,
You have read.

But there's another conqueror of noble mien and station—
A hero for whose wondrous deeds deserves great commendation,
'Tis he who waxeth rich through "losing" brickyard operations,
Be it said.

SINCE DAD STARTED IN MAKING BRICK.

[With improvements on the man who wrote "Since Dad Got a
Government Job."]

Run quick for the dressmaker, Mary,
And tell her to name her own price,
For you and Matildy an' Sairy
Will want something 'specially nice.
Tell the tailor to use his own pleasure
'Bout them suits for Josiah and Dick,
We'll want all our clothes made to measure,
Since dad's started in makin' brick.
I'll ask Mrs. Perkin to-morrow
To take us to where we can get
The richest of carpets, and borrow
Her book on polite etiquette.
And we must have a coach and a lackey,
And a herald and livery slick;
I'll outshine Mrs. Millionaire Mackey
Since dad's started in makin' brick.
An' as long as we've sech expectations
We won't pay the squire all is due,
Just you tell him to make preparations
To fix up a mortgage or two.
Yer grandmother and yer aunt Mandy
Says the sounds of sich things make 'em sick;
But a mortgage or two may come handy
Before daddy gets done makin' brick.

ODE TO THE MUD YARD.

My brickyard 'tis of thee,
Soft mud and misery,
Of thee I sing.
Yard where I toiled and sweat,
Hoping some cash to get,
Until my shirt was wet,
And hope took wing.
I love thy wobbly mills.
Thy pale and melted kilns,
Oh! don't I, though!
I love thy brickbat piles,
They wreath my face in smiles,
With thoughts how free erstwhile
I spent my dough.
Let music swell the breeze
And ring from all the trees,
Oh, land of mud!
The season's gone to pot,
The cash I had I've not,
Let creditors go to rot,
I'm done for, good.

TABLE OF CONTENTS.

| | | | |
|---------------------------------|-----|--------------------------------|-----|
| A Great Newspaper Building .. | 217 | Suggestions for Future Work | 248 |
| A Fixing Brick..... | 218 | Observations of an Old Time | |
| Modern American Front Brick | 218 | Member | 248 |
| New Furnace for the Drying of | | Kind Words for the "Steam | |
| Clays..... | 221 | Maker"..... | 249 |
| Anglo-American Pottery | 222 | Congratulations From a New | |
| In Philadelphia Brickyards— | | Member | 249 |
| A New \$2,000,000 Mint..... | 225 | The Benefits of Convention | |
| German Notes..... | 225 | Work not Confined to the | |
| Inspection Waives Defects—of | | Convention Hall or Conven- | |
| Interest to Brick Contractors | 226 | tion Report | 250 |
| Milwaukee Brickmakers see | | We Stand Corrected..... | 250 |
| Light Ahead..... | 226 | Glazed Brick..... | 250 |
| A Brick Factory in a Wooden | | Rocking Grates for Steam Boil- | |
| Town | 227 | ers and Kilns | 251 |
| A Charming Picture | 227 | "Right Wrong" in Burning | |
| Brickyard Sketches—a Nebras- | | Brick | 252 |
| ka Paving Brick Plant..... | 228 | The New York Market..... | 253 |
| A Very Profitable Meeting | 228 | Kept at Home by a Disastrous | |
| Buttonhole Talks..... | 229 | Fire..... | 254 |
| The Disintegration of Clay by | | St. Louis Brick News | 262 |
| Frost..... | 229 | Pacific Coast News..... | 266 |
| Hollow Ware Sewers—A New | | Improvement at Toledo | 266 |
| Application of the Hollow | | EDITORIAL: | |
| Block..... | 230 | Current Comment..... | 255 |
| A Brickmaker's Education..... | 231 | Contractors' Troubles..... | 255 |
| A Brickwork Fireplace..... | 234 | Local Organization | 255 |
| A Manual for the Manufacture | | The German Association Topics | 256 |
| of Brick | 235 | The Question of the Hour..... | 256 |
| Brickyard Experience | 235 | Brick in Boston..... | 256 |
| A Simple Method of Making | | Convention Aftermath..... | 260 |
| Decorative Brick | 235 | Trade News and Comment..... | 260 |
| New Inventions..... | 236 | Editorial Notes and Clippings. | 264 |
| The Inventor's Diligence..... | 236 | MISCELLANY: | |
| Value of Government Statistics | 237 | A Very Bad Habit..... | 224 |
| New Combined Brick and Tile | | Heroic Treatment..... | 229 |
| Machine..... | 238 | Illustrating Uncle Sam's | |
| By the Light of the Kiln Fire— | | Wealth | 234 |
| Explosive Brick | 239 | A Handsome Book..... | 254 |
| Obituary | 254 | We Bow to Him..... | 257 |
| Return Traps for Steam Dryers | 263 | Since Dad Started in Making | |
| Staining Bricks..... | 268 | Brick | 257 |
| CORRESPONDENCE: | | Ode to the Mud Yard | 257 |
| CONVENTION ECHOES. | | A Fearful Change..... | 260 |
| Glad he Joined the N. B. M. A. | 248 | A Natural Conclusion | 266 |
| "Father" Pike's Impressions . | 248 | | |

Index to Advertisements on Next Page.

Books for...

Brickmakers.

| | |
|-------------------------------|---------|
| "CLAY GLAZES AND ENAMELS," | |
| Henry R. Griffen, C. E. | \$ 5.00 |
| "BRICKMAKER'S MANUAL," | |
| Morrison and Reep, | 3.00 |
| "BRICKMAKING AND BURNING," | |
| J. W. Crary, Sr., | 2.50 |
| "TABLE OF ANALYSES OF CLAYS," | |
| Alfred Crossley, | 1.00 |
| "VITRIFIED PAVING BRICK," | |
| H. A. Wheeler, E. M., | 1.00 |
| "PRACTICAL FARM DRAINAGE," | |
| J. J. W. Billingsley, | 1.00 |

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

TO LEASE ON ROYALTY.—A fine bed of fire clay, extent 15 to 30 acres.
Thickness 10 to 20 feet. Coal underneath to lease on royalty in connection with clay. Site for brick works. Terms and particulars, apply to
31 cm WILLIAM TURNER, P. O. Box 202, Johnstown, Pa.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

| Name. | Page. | Name. | Page. |
|------------------------------------|----------|---|----------|
| Simpson Brick Press Co | 215 | The American Clay-Working Machinery Co..... | 287, 290 |
| The Chisholm, Boyd & White Co..... | 212, 213 | The Fernholtz Brick Press Co.. | 214 |

Brick and Tile Machinery.

| | | | |
|---------------------------------------|---------------|---|----------|
| Anderson Foundry and Mach. Works..... | 284 | Steele, J. C., & Son..... | 278 |
| Baird and Son, H. C..... | 276 | The Fate-Gunsaulus Co..... | 295 |
| Brewer, H. & Co | 297 | The Huetteman & Cramer Co.... | 283 |
| Carlin's Sons, Thomas | 283 | The American Clay-Working Machinery Co..... | 287, 290 |
| Central Machine Works | 291 | The Horton Mfg Co | 288 |
| Chambers Brothers Co., 209, 270, 282 | | The Eastern Machinery Co..... | 298 |
| Chicago Brick Machinery Co.... | 286 | The Henry Martin Brick Mach. Mfg. Co | 272, 294 |
| Eagle Iron Works..... | 270 | The Leader Mfg. Co..... | 282 |
| Freese, E. M. & Co | 296 | The Ohio Ceramic Engineering Co | 210 |
| Frost Engine Co | 289 | The Wallace Mfg. Co..... | 269, 299 |
| Hensley, J. W..... | 267 | The Wellington Machine Co 263, 265 | |
| Kells & Sons | 276 | Williams Patent Crusher and Pulverizer Co | 267 |
| Means & Co., Jas..... | 274 | Wiles Co., A. M. & W. H | 278 |
| Madden & Co..... | 277 | Woolley Foundry and Machine Works | 292 |
| Murray & Welch | 272 | | |
| Potts & Co., C. & A..... | 210, 258, 293 | | |
| Raymond & Co., C. W | 259, 261 | | |
| Stedman's Machine Works..... | 278 | | |

Brick Kilns and Dryers.

| | | | |
|----------------------------|-----|--------------------------------|-----|
| Alsip, S. H | 279 | Phillips, S. G..... | 276 |
| Carson, J. W..... | 271 | Reppell, L. H | 279 |
| Eudaly, W. A | 280 | Swift, F. E..... | 274 |
| Haigh, H..... | 281 | The American Blower Co..... | 300 |
| Kaul, C. F..... | 272 | The Fernholtz Brick Press Co.. | 214 |
| Lehmann & Co, F..... | 281 | The Standard Dry Kiln Co..... | 216 |
| Morrison & Co., R. B | 280 | Wolff Dryer Co..... | 300 |
| Pike, E. M..... | 273 | Yates, Alfred..... | 273 |

Brick Yard Supplies.

| | | | |
|-------------------------------|-----|--|----------|
| Arnold, D. J. C..... | 284 | Phillips & McLaren | 274 |
| Coldewe & Co., G..... | 274 | The Atlas Bolt & Screw Co..... | 285 |
| Carnell, Geo..... | 279 | The Harrington & King Performing Co | 211 |
| Caldwell & Son Co., H. W..... | 275 | The Henry Martin Brick Machine Mfg. Co | 272, 294 |
| Carinichael, T. W..... | 274 | The Horton Mfg. Co..... | 288 |
| Elder & Dunlap..... | 271 | The Pittsburg Mineral Screen Company..... | 273 |
| Marion Steam Shovel Co..... | 285 | | |
| Mey, F. H. C..... | 273 | | |
| Mershon & Co., W. B | 211 | | |
| Newton, A. H..... | 277 | | |

Miscellaneous.

| | | | |
|--|-----|--|-----|
| Associated Trade & Industrial Press | 274 | Indianapolis Engraving and Electro Co..... | 271 |
| Bennett & Sayer..... | 270 | Indianapolis School of Medicine..... | 272 |
| Big Four R. R..... | 277 | Indiana, Decatur & Western ... | 276 |
| Cincinnati, Hamilton & Dayton R. R | 275 | Illinois Central R. R | 276 |
| Chesapeake & Ohio R. R..... | 277 | Lake Erie & Western..... | 277 |
| Cotton Belt Route..... | 277 | Main Belting Co | 275 |
| Dean Bros. Steam Pump Works | 270 | Monon Route | 275 |
| Dover Fire Brick Co..... | 275 | Osborne, W. R..... | 273 |
| Evens & Howard | 271 | Sorge, A. Jr.,..... | 272 |
| Gabriel & Schall..... | 273 | Tennille, A. F..... | 271 |
| Geysbeek, S..... | 272 | The Jeffrey Manufacturing Co.. | 277 |
| International Correspondence Schools | 272 | The Rockwood Mfg. Co | 275 |
| Indianapolis College of Law ... | 271 | Vandalia Line | 276 |
| | | Waterman, L. E. & Co..... | 275 |
| | | Small Ads., Wanted, For Sale, etc. | |

Mention the Clay-Worker

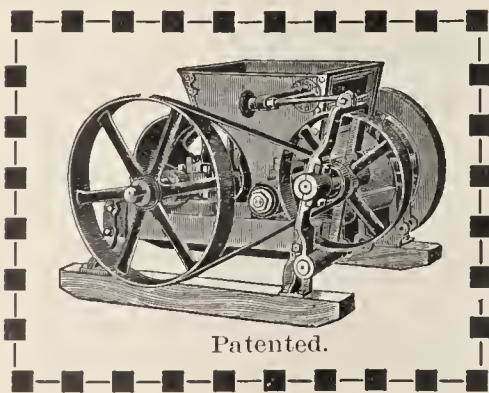
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Mention the Clay-Worker

The Potts Disintegrators

Simple in Construction, Strong and Durable.

Work any clay direct from bank. They will not choke or clog. They grind the small stone and separate the large ones.



Milledgeville, Ga., November 4, 1897.

C. & A. POTTS & CO., Indianapolis, Ind.

Gentlemen:—For ten year I used one of your old style Disintegrators, it did good work early this year I had it changed to the way you now make them and it is simply perfect. My son uses one of your Disintegrators and without it he could not make first-class brick out of the clay he has to use. Every brickmaker who has hard clay to work should put in one of your Disintegrators, it does all you claim for it.

Wishing you much success I am

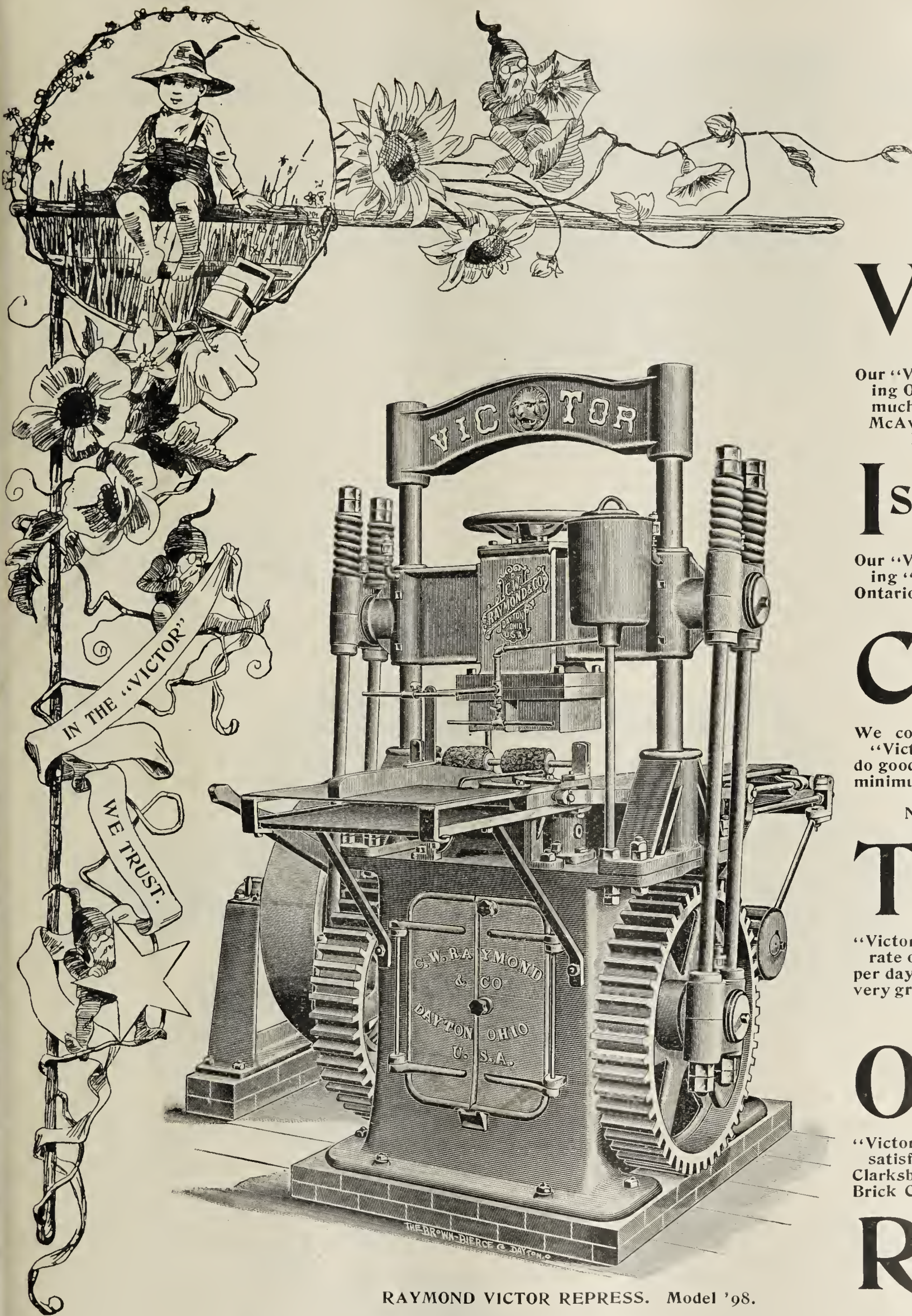
Yours truly,

J. W. McMILLAN.

We manufacture 12 sizes of Disintegrators and can furnish any size promptly. We guarantee them to do as claimed or no sale.

Write for prices and terms.

C. & A. POTTS & CO., Indianapolis, Ind.



RAYMOND VICTOR REPRESS. Model '98.

Victor

Our "Victor" Re-press is working O. K. and we like it very much.
McAvoy Vitrified Brick Co.,
Perkiomen Junction, Pa.

Is....

Our "Victor" Re-press is working "out of sight."
Ontario Paving Brick Co., Ltd.
Toronto, Canada.

Certainly

We congratulate you on the "Victor" Re-presses. They do good work and require but a minimum amount of repairs.
Mack Mfg. Co.,
New Cumberland, W. Va.

The

"Victor" Press running at the rate of 28,000 to 30,000 brick per day. I must say that I am very greatly pleased at its work.
T. W. Carmichael,
Lazearville, W. Va.

Only

"Victor" Press working very satisfactory.
Clarksburg High Grade Shale Brick Co., Clarksburg, W. Va.

Re-Press.

C. W. Raymond & Co., Dayton, Ohio, U. S. A.

CONVENTION AFTERMATH.

What everybody says must be true. Everybody says the Pittsburg Convention was an unqualified success in every particular and detail—that is every particular but one—the Secretary. He's a villain still. As every well-constructed play must have a villain, and the Secretary is a harmless, mild-mannered, successful villain, the members of the N. B. M. A. bow to the inevitable, and rejoice that their Conventions are successful in every respect, even to the villain.

Charles H. Classen, Baltimore, Md., whose commanding figure was conspicuous in the Monongahela during Convention week, writes complimenting us on the complete and accurate report of the Convention in the February Clay-Worker, and encloses a menu card of a banquet participated in by the Baltimore brickmakers, February 26th. Ten of the leading firms were represented, and if we may judge from the bill of fare, they enjoyed themselves thoroughly. These social amenities result in great good. It pays competing brickmakers to get better acquainted, one with another.

J. H. Chambers, manager of Chambers Brothers Company, Philadelphia, writes, under date of the 3d inst.: "Concerning the Pittsburg Convention, I have only to say that it was a winner in every sense of the word. Business commenced to pick up with us the day we reached Pittsburg, and it has kept on picking up every day since. We are quite busy now, and have booked more orders in the last two weeks of February than in two or three months previous. Orders are not confined to one section alone, but are generally scattered."

F. E. Swift, of Washington, Iowa, the patentee of the well-known kiln furnace which bears his name, writes that the more he thinks of the National Convention the better he is pleased with his trip to Pittsburg. Says he is more than doubly paid for the time and expense of the journey, and thinks those who arranged the programme and provided for the entertainment of the visitors deserve a great deal of credit, and that if he lives he will surely be at the next Convention, and will endeavor to have a number of Iowa brickmakers join the National Association and help on the good work.

TRADE NEWS AND COMMENT.

Charles Taylor's Sons, Cincinnati, Ohio, write that they are in the market for a clay disintegrator, and will be pleased to receive catalogues, etc.

In a recent letter the Horton Manufacturing Company, Painesville, Ohio, says: "We are very busy, having secured some eight or ten orders since the Convention, and they are still coming."

The Chicago Brick Machinery Company ask especial attention to their new dry press, an excellent cut of which is shown on page 286. They say they are ready to back up every claim made for this press, and they are many.

C. & A. Potts & Co., Indianapolis, report a decided improvement in trade. They recently booked a number of orders for brick machines. Since the first of March they have sold five complete outfits to parties in the Northwest who "saw ad. in Clay-Worker."

T. W. Carmichael, Wellsburg, W. Va., writes that the demand for his clay steamer continues brisk. Among others, he has made shipments during the past month to San Francisco and Los Angeles, Cal. His steamer is commended highly by dry press manufacturers who have tried it.

W. G. Jennings, Reedsville, N. C., sends in his yearly subscription and says he is going to open up a shale paving brick plant in April, and will be in the market for machinery and appliances for same. He wants to purchase a brick machine that will work the shale just as it comes from the crusher.

The improved J. N. K. Brick Machine, which is pictured on page 291, is considered a decided improvement on machinery of this type. It is made with and without repress attachment, as

may be seen by referring to the advertisement. Brickmakers desiring to make a fine grade of pressed brick by the tempered clay process should investigate the merits of this machine. Mr. Kanfholz, the inventor, is confident that his new machine is superior to anything heretofore offered the trade, and stands ready to guarantee the claims made for it.

C. W. Raymond & Co., of Dayton, Ohio, write that they are very busy; that while they are taking no large government contracts, by reason of the prospective war with Spain, they are getting their full share of contracts for brick machinery. They are offering the trade a number of new appliances, as will be seen by referring to their advertising pages.

Elder & Dunlap, Bloomington, Ill., manufacturers of the Perfect Clay Screen, write that business is good with them. They have recently filled orders for screens from the Barr Clay Company, Streator, Ill.; Evens & Howard, St. Louis; Minonk Coal and Tile Company, Minonk, Ill.; Chicago Terra Cotta Company, Ottawa, and the W. S. Dickey Manufacturing Company, Kansas City, Mo.

The Wallace Manufacturing Company, Frankfort, Ind., report busy times at their factory. They have sold an unusually large number of machines for this time of the year. They are particularly pleased with the reception accorded their new combination end and side-cut automatic table by those who have used it. Its success is phenomenal. They will be glad to tell our readers all about it.

A FEARFUL CHANGE.

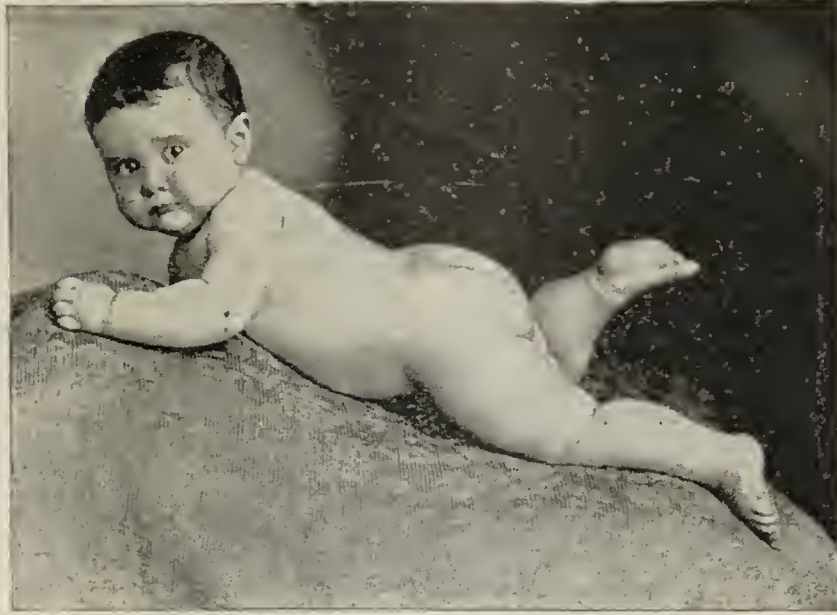


Mary had a little lamb;
Its fleece was white as snow.
She took it to Pittsburg with her—



—And now it looks just so.

A NAKED PROPOSITION

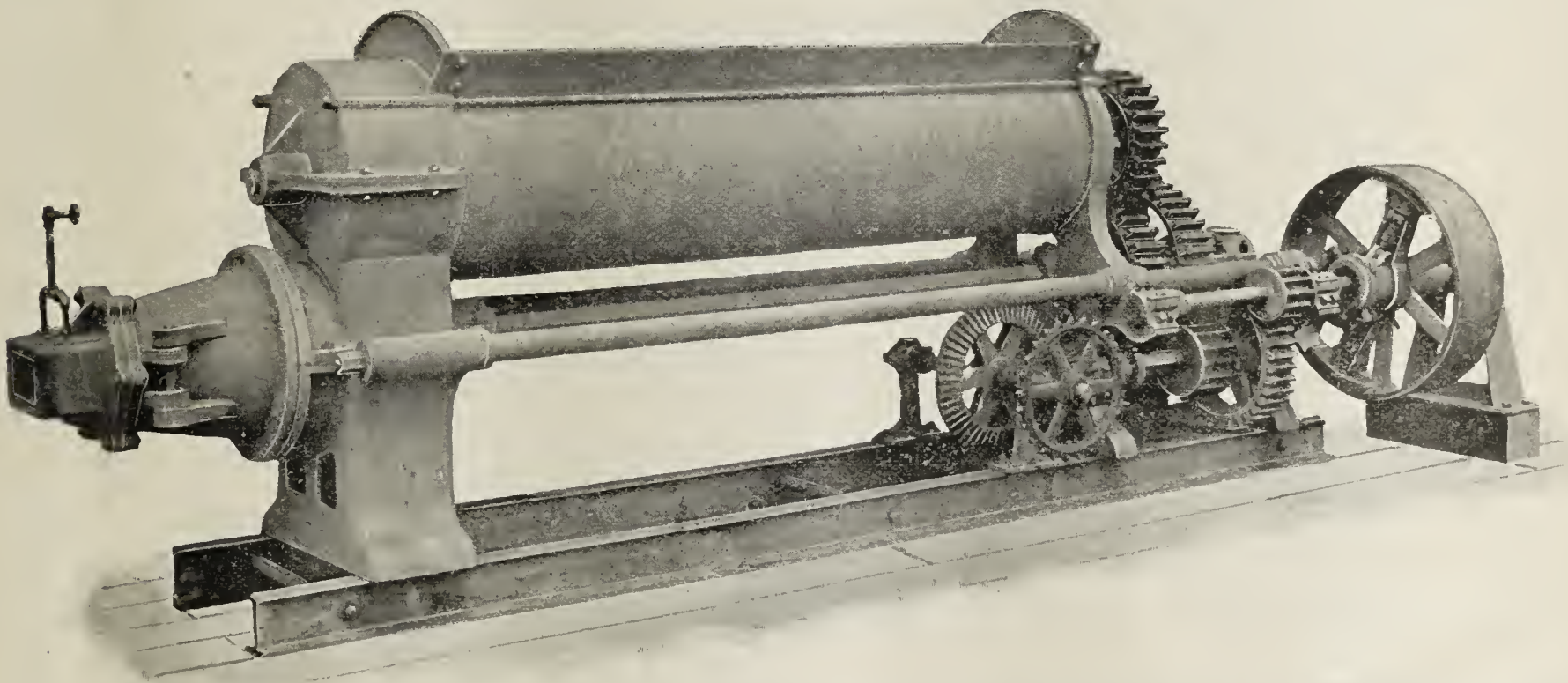


*Unadorned with -
Gilded Sophistry
or Seductive - - -
Fabrication - - -*

It is a fact that compound gearing is superior in every respect to single gearing. Single gearing requires more power to operate. It wears out more quickly. It is much harder on the machine. In short, it is but a weak attempt by cheap machine manufactures to make one gear and one pinion do the work that should be done by two gears and two pinions, in order to reduce the cost, thereby giving them larger profits. You can not afford a single-gear brick machine at any price.

The Raymond No. 2 Compound-Geared Combined Brick Machine is operated by four massive gears and two heavy pinions, which form the mechanical equivalent of an independent Compound-Geared Pug Mill and a Compound-Geared Brick Machine. It also has many other points of excellence that you can not afford to ignore. For instance: Its main shafts are 3½ inches hexagon hammered steel and the others are proportionally heavy. The die has a hinged front and is fitted with our improved scale liners for steam, oil, or water lubrication. It is bolted down on channel iron I beams instead of wooden skids—making it more rigid and strong. These I beams do not warp or twist and throw the machine out of line as wooden ones do when subject to brick yard use. The Pug Mill is 9 feet long. Its estimated weight is 12,000 lbs. and has a capacity of from 25 000 to 40,000 bricks per day.

In short, in this article we have endeavored to elevate the Combined Machine from the class generally known as cheap where it has been placed, to that of the high finished, durable, easy running, high grade, first class Brick Machine and it is to you, our patrons, to whom we turn for the success or failure of our efforts.



Raymond No. 2

Compound-Geared Combined Machine.

The Automatic Board Delivery Cutting Table will interest you.

C. W. RAYMOND & CO.
DAYTON, OHIO.

ST. LOUIS BRICK NEWS.

THE ST. LOUIS MARKET is gradually assuming a more healthy complexion. The demand for brick is increasing steadily, but what is more encouraging even than this to the brickmakers is a growing tendency to increase and maintain prices. Our brickmakers are growing weary of working for glory alone, and that is what making and delivering brick for \$5 a thousand or less amounts to. There is some talk of forming a local organization. It is generally conceded that concerted action is necessary to insure even a moderate margin of profit. It is now an open secret that some of our large companies have sold brick for less than the actual cost of production during the last season or two. Fortunately for all concerned, stockholders are calling a halt, and it is thought a better and more rational condition will prevail the coming season.

The Superior Pressed Brick Company, who have heretofore made common brick only, are putting up a couple of square down-draft kilns of their own designing for the burning of face brick. They will probably add a line of buff brick to their output.

The Illinois Supply and Construction Company started their works at Collinsville, Ill., the first week in March, after a shut-down of sixty days, during which they overhauled the plant thoroughly. Among other improvements, they added a new machine house and put in an equipment, including forge, lathes, drills and all the necessary appliances for the machine work necessary about a large dry press plant. They also built a new stock shed that gives them much greater storage facilities. They now have on hand about 3,000,000 pressed and ornamental brick of various shades of buffs, grays, reds and mottled brick, of which they make a great variety. These brick are made on a hydraulic machine of their own building, and burned in Grath kilns, which they also own and control. They report a fair demand for brick, with a prospect for a decided improvement in trade as spring advances.

J. J. Koch, who has been connected with the Illinois Supply and Construction Company, of St. Louis, for a number of years, and who is the inventor of the hydraulic brick press used by that company, has accepted a position with the Green-Hunter Brick Company, Thurber, Texas, and is now a resident of the Lone Star State. He reports very favorably as to the condition of the yard; indeed, he says he considers it one of the best arranged and equipped dry press plants he has ever seen, and predicts a decided success for the company. They now make a fine grade of red brick, but may also turn their attention to buff building brick and fire clay pavers.

Anthony Ittner, the veteran brickmaker, has completed some extensive improvements in his plants at Belleville, and is now ready for the spring rush. He got a foretaste of this in the shape of an order for 3,000,000 sewer brick for a job in West St. Louis, and has booked a number of smaller orders that will keep both his plants running full time for a while.

The College Hill Press Brick Company, operated by the Kullage Bros., and located in the northern part of the city, have taken some large contracts this month, aggregating four or five million brick, and are now running to their full capacity. It is rumored that they have recently completed a large plant in northern Indiana, some thirty miles from Chicago, and will soon be active bidders for a part of the front brick trade of the Windy City. Pete Kilker, one of the best-known burners of St. Louis, has charge of the kilns at the new plant.

There is an increasing interest in brick pavements in St. Louis, and East St. Louis as well. The latter town draws its supply of pavers chiefly from Indiana, the Wabash Clay Company, of Veedersburg, having secured nearly all the paving contracts let to date. In St. Louis the Galesburg brick seems to be gaining in popular favor, and it is thought that several millions of them will go down on resident streets the coming season. The Evansville (Ind.) Press Brick Company have also put a quantity of pavers in our streets. These two concerns, who have a wide-awake representative here, will probably divide the local business with the St. Louis Press Brick Company, who formerly had a monopoly of this branch of trade—a condition that, in the nature of things, could not last. Competition is sure to come in every field of any importance.

Evans & Howard, the well-known manufacturers of sewer pipe, terra cotta, etc., are again very busy. They recently booked some large orders for sewer pipe, so are again running full time in that department. They are giving considerable attention to buff and mottled building brick. This feature of their business is now looked after by T. P. Plumridge, who for a number of years was Assistant Secretary of the Hydraulic Press Brick Company. He is thoroughly in touch with the

building interests, is a great hustler, and will no doubt be able to increase Evans & Howard's trade very materially.

W. B. McCormick, of Shreveport, La., has been in St. Louis for the past two weeks investigating the various systems and machines for the manufacture of pressed brick. After making a most thorough investigation, he told the Clay-Worker correspondent he had decided upon the Ross-Keller six-mold machine. He said he saw other six-mold machines that were cheaper, but he thought the best was the cheapest in the long run. "The Ross-Keller Company gave me a straight guarantee for two years against breakage, and as their press will make more good brick than any other, I think I have acted wisely in buying it."

H. A. Wheeler, Secretary and Treasurer of the Standard Tile Company, recently made an extended trip East in the interest of their tile. Mr. Wheeler is an ardent believer in the superiority of burned clay as a roofing material, and is confident that its use will become more general, now that there are a number of roofing tile plants in different parts of the country in successful operation. Their factory is turning out a splendid quality of vitrified roofing and siding tile, which is far superior to slate or other roofing material. A. SAINT.

RETURN TRAPS FOR STEAM DRYERS, ETC.

ONE OF THE MOST important matters to be looked after in the manufacture of bricks is the uniform and thorough drying of same before baking. In order to accomplish this in an efficient and economical manner, it is necessary that the steam coils in the dryers be kept at a uniform temperature and free from the condensed steam which will fill these coils and prevent proper circulation of the steam. All users of steam dryers are fully aware of the difficulties and annoyances consequent upon imperfect drainage of their coils, and various expedients have been used to prevent this. In some cases a vent cock or valve is left slightly open, so as to keep the coils clear. This wastes considerable steam and water, and makes the operation of the dryers very expensive. In other cases small pumps and receivers are employed for returning direct to the boiler or elsewhere the condensation of the coils. These pumps need constant attention and oiling, and frequently cause trouble by getting out of order, besides being very wasteful in the use of steam for operating them. It is, therefore, a very important and urgent question for the brick manufacturer to find a means of draining these coils positively, automatically, and by some apparatus which does not require constant attention and repairs. Also, this work should be done with the very smallest possible consumption of steam. The best solution of this problem which has been presented up to date is by means of the return trap shown in the cut. This apparatus works by gathering the drainage of the coil into a pear-shaped bowl hung on trunions at its smaller end and held up in a yoke frame by a counter-weight placed on a lever, which holds up this bowl when empty through a rod connected to the large part. When the drainage fills this bowl with condensed steam or water, its weight overbalances the counter-weight and causes the bowl to settle in the yoke frame. This causes the raising of the valve stem attached to the small end of the bowl, which opens a live-steam valve and puts the full steam pressure on the contents of the bowl, thus inducing the discharge of same. After emptying, the bowl again rises and closes the steam valve, but at the same time opens a small vent valve directly below the steam valve, which then permits the steam in the bowl to escape and again allows further condensation or drainage to enter it. The faster condensation forms in the coils the faster will it flow into the bowl and the more frequent will be the discharges of same. In fact, the apparatus accommodates itself (up to the limit of its proper capacity) to the rapidity or slowness of the condensation, and is therefore entirely automatic in its operation. The only pieces of operative mechanism are the steam and vent valve, and they are in plain view. No working parts (such as valves, tappets, etc.) are enclosed or hidden from view, thus making any necessary adjustment a very simple matter. The device depends simply upon gravity or the weight of the inflowing water for its operation, and therefore does not need constant attention. A drop of oil on the trunions and valve stem once a day furnishes all needed lubrication, and this only as a matter of precaution. The volume of steam consumed is only equal to the volume of water of condensation discharged, while a pump needs many times this amount. It is therefore economical in the consumption of steam. Taken altogether, this apparatus undoubtedly offers the best solution of the vexatious question of draining steam coils that has yet been offered. Its application to particular cases naturally involves adaptation to the existing conditions, and we would refer our readers for further particulars to A. Sorge, Jr. & Co., 1020-1021 Monadnock Block, Chicago, Ill.

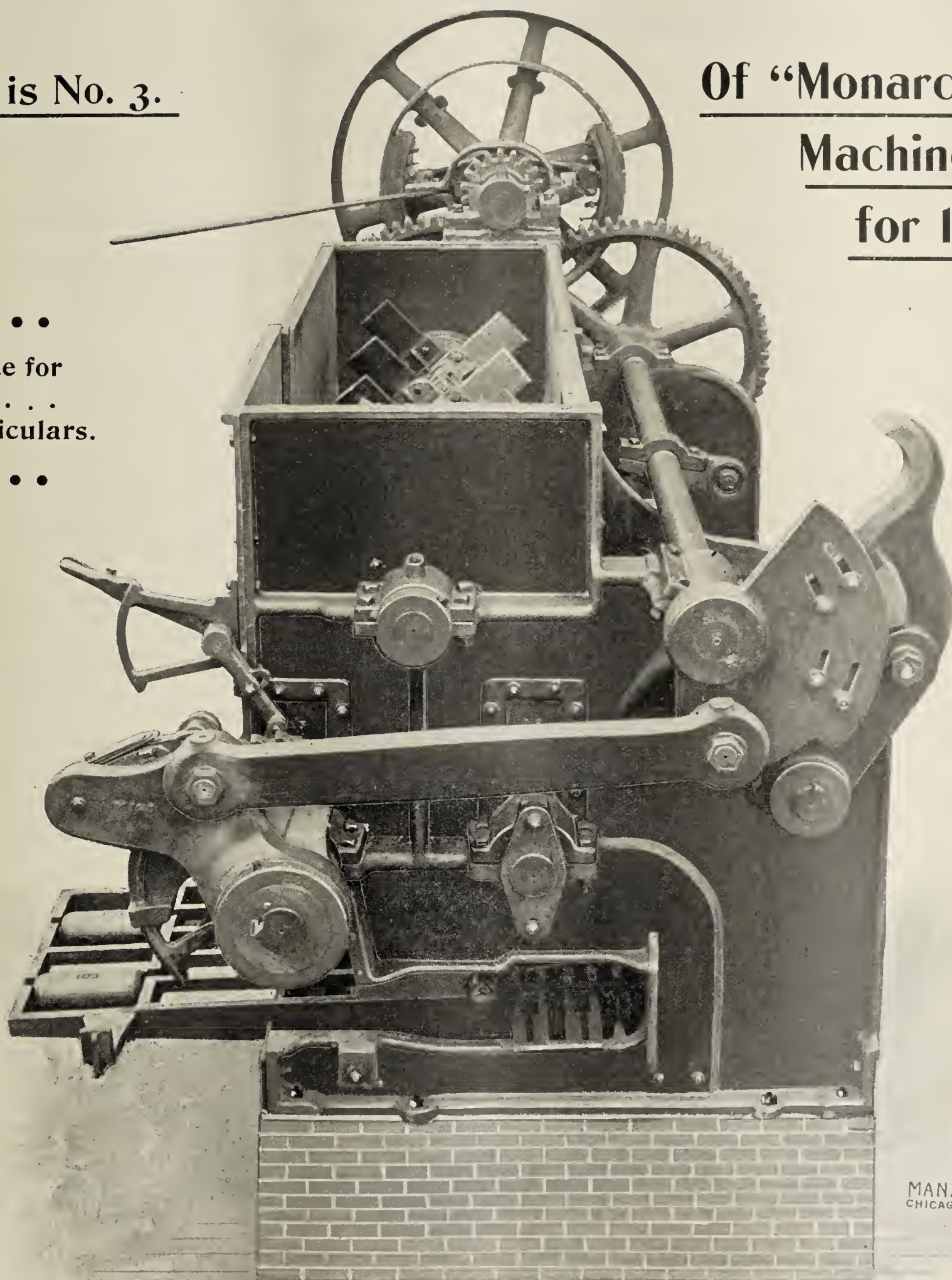
FOUR STYLES,

This is No. 3.

Of "Monarch"
Machines
for 1898.

• • •
Write for
Full . . .
Particulars.

• • •

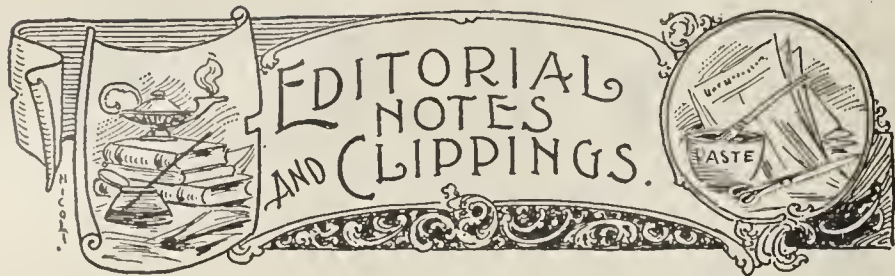


MANZ
CHICAGO.

The Wellington Machine Company,

(See Also Page 265.)

WELLINGTON, OHIO.



H. B. Harvey contemplates erecting a pottery at Gadsden, Alabama.

Meklenberg & Co. will operate a new brick plant at Arcadia, Wis.

John Kostner and John Mecklenberg will open up a brickyard at Arcadia, Wis.

The Moosic (Pa.) Brick Company has been organized, with a capital stock of \$21,000.

W. F. Morrill has purchased land at Mt. Ayr, Iowa, where he will establish a brickyard.

Mr. James M. Black, of Port Alleghany, Pa., is putting in a full outfit of Martin brick machinery.

The Princeton (Minn.) Brick Company has been incorporated, with a capital stock of \$20,000.

M. B. Gladman will start a brickyard at Sheridan, Mo. Work will begin on the yard at an early date.

H. Rowe has purchased the brickyard of R. George at Kingston, N. Y., and will operate same the coming season.

E. Lambert & Son, of Shannon City, Iowa, contemplate the establishment of a brick and tile factory at Greenfield, Iowa.

The Ashland (Ky.) Fire Brick Company will rebuild the burned portion of their plant, putting up brick buildings this time.

M. Johnson and L. Thompson, of Earlville, Ill., will locate at Lynn Grove, Iowa, where they will establish a brick and tile factory.

The Patton Clay Company, Johnstown, Pa., are preparing to make improvements at their plant with a view of increasing their capacity.

The Indiana Clay Company has been incorporated at Shoals, Ind., to manufacture pottery. They have capital stock amounting to \$15,000.

E. M. Freese & Co., Galion, Ohio, are at present busy filling a rush order for a complete brick and tile plant for shipment to the West Indies.

Hutmacher Bros. contemplate starting a new brick plant at Dieterich, Ill. They expect to be in operation in time to get their full share of the spring trade.

The Ittner Brick Company has been incorporated at Omaha, Neb., with a capital of \$15,000. The stockholders are H. H. Ernest A., Ella A. and Henrietta Ittner.

W. E. Smith has purchased the interest of H. R. Davis in the White & Davis tile factory, and, in partnership with Mr. White, will operate the tile plant at Harvel, Ill.

Knapp Bros., proprietors of the Arcadia brick factory, at Crowley, La., are enlarging their plant. They have just purchased machinery that will double their capacity.

Mr. Henry Harrington, of Colfax, Iowa, and Joseph Whitehead, of Chatham, Va., have both put in Martin latest improved horse-power machines within the past few weeks.

The Harris Brick Company, of New York City, has been incorporated, with a capital stock of \$150,000. John B. Baxter, 100 Taylor street, New York, is at the head of the concern.

Mr. William W. Fell, of Trenton, N. J., has changed his hand yard, having put in a Martin steam power brick machine, which he expects to have in operation to supply the early spring trade.

Mr. George C. Pedrick, of Flemington, N. J., has lately installed a Martin brick machine, combined with horizontal pug mill, and expects to have the same in operation within a few weeks.

The Rose Brick Company, Roseton, N. Y., are making some extensive improvements in the plant. They have erected a new engine and boiler house, and will put in some new machinery.

The Columbus (Ohio) Pressed Brick Company, recently incorporated, elected the following directors: Lorenzo D. Hagerly, C. H. Forry, Walter B. Sells, William Bott, Ted B. Galloway, E. J. Farley and E. J. Camnitz. The directors chose the following officers: Lorenzo D. Hagerly, President; William

Bott, Vice-President; Walter B. Sells, Secretary-Treasurer; C. H. Forry, Superintendent. The general offices will be in Columbus and the plant in Lexington.

J. J. Baughman has purchased Leedy's brickyard at Harrisburg, Pa. He will improve same materially. Mr. Baughman is an extensive builder, and will use almost the entire product of the yard.

Mrs. A. Thaison writes that, owing to the death of A. Thaison, which occurred January 22d, the plant of the Laredo Brick Works, located at Laredo, Texas, and owned by Mr. Thaison, is now for sale.

The Sutton & Sunderly Company, of Coeymas, N. Y., has been incorporated for the purpose of manufacturing and selling brick. The stockholders are John H. Sutton, Conrad F. Jr., and Alice B. Sunderly.

The Tennessee River Bottom Brick Company has been organized at Decatur, Ala., by B. M. Nelson and A. W. Sharpley. They expect to be in full operation by April 1st and to have a daily capacity of 25,000.

The Enterprise Clay Company is putting in new machinery at the plant at Bountiful, Utah, including a dry press. P. E. Hatch, the manager, says this will enable them to put brick into the Salt Lake City market.

The plant of the Ft. Dodge (Iowa) Pressed Brick Works was completely destroyed by fire March 11th. The loss is estimated at \$26,000, on which there was insurance amounting to \$4,500. They will probably rebuild.

John Hill and H. P. Brown will establish a dry press brick plant at Las Vegas, Mexico. Both Messrs. Hill and Brown are experienced brick manufacturers, and say they expect to turn out a fine grade of dry pressed brick.

The National Brick Company, of Camden, N. J., and Philadelphia, has been incorporated by John Brock and George D. Armstrong, of Philadelphia, and Joseph S. Hulme, of Mt. Holly. The works will be located at Camden.

W. E. Langenberg has sold his brick plant at Stevens Point, Wis., to his son, Edward, for a consideration of \$27,500. Mr. Langenberg, Sr., expects to start a new plant early in the summer in the northern part of Wisconsin.

Mr. John Hilton, Dunkirk, N. Y., has lately received a Martin latest improved letter "A" brick machine, with horizontal pug mill combined, and is remodeling his entire plant. He has had a Martin machine in use since 1889.

R. H. Rutledge and F. P. Fonville, of Sharon, Tenn., have purchased land near Martin, that State, where they will erect a steam brick plant. Both gentlemen have money behind them, and expect to make a success of the new venture.

The Green & Hunter Brick Company, of Thurber, Texas, said to be the finest plant in the United States, is putting in another six-mold Ross-Keller machine, it being the second of this size and make put in by them during the last year.

The Builders' Brick Manufacturing Company, of Hooper, Neb., have increased their plant by putting in a Henry Martin letter "A" steam power brick machine and horizontal pug mill combined. They have had a Martin machine in use since 1887.

G. F. and E. A. Arnold, W. P. and M. S. Martin, all of Brewton, Ala., have incorporated the Mobile Brick Company, and will establish brick works at Mobile, Ala. They have a capital stock of \$20,000. M. S. Martin is at the head of the concern.

D. E. Pidgeon writes that he has purchased his brother's interest in the brick business of Pidgeon Bros., Salem, Ohio, and that the firm name is changed to D. E. Pidgeon. Mr. Pidgeon says he will for the present deal in common and shale brick.

The plant of the Brazil (Ind.) Pottery and Clay Manufacturing Company was almost totally destroyed by fire on the night of February 20th. The loss is estimated at \$5,000, on which there was \$2,000 insurance. The origin of the fire is unknown.

A large brick plant will be erected at Camp Run, Pa. It will be operated by W. R. Meredith & Bro., with A. C. Moyer, of Tyrone, Pa., as manager. The latter gentleman has had twenty years' experience in the brick business. The plant will have a daily capacity of 30,000, including fire, paving and building brick. The main office of the company will be at Reynoldsville, Pa.

The brick manufacturers of Cleveland, Ohio, have formed an agreement whereby they hope to maintain better prices for their product in the future. An agency has been formed, of which C. G. Barkwill and H. Bradley will have charge. All orders for brick will be received by them, and will be appor-

[CONTINUED ON PAGE 266.]

Didn't You Know It?

Use of improved Automatic Machinery has enabled a reduction in the price of Brick Moulds, at the same time improving quality of manufacture.

LOOK | **REGULAR MACHINE MOULDS**, the heretofore standard grade in quality, \$1.75 each
"SPECIAL" MACHINE MOULDS. An improvement. Selected hard cherry; bound with heavier steel; larger, longer and more screws; screws in bottom of partitions. We recommend their use, - - - \$2.00 each
EXTRA, (per mould.) Steel lined at ends, 25 cents. Panels 25 cents. Crimped bottom irons 15 cents.

Let us make you a trial proposition for one of our "Wellington" Mould Sanding Machines. Its simple and perfect, and the price—that is what will astonish and please you.

**AN EYE
OPENER**

The "Iron Quaker" Machines

For 1898 are **BETTER
THAN EVER.**

This cut shows the steam power in connection with our Mould Sander.

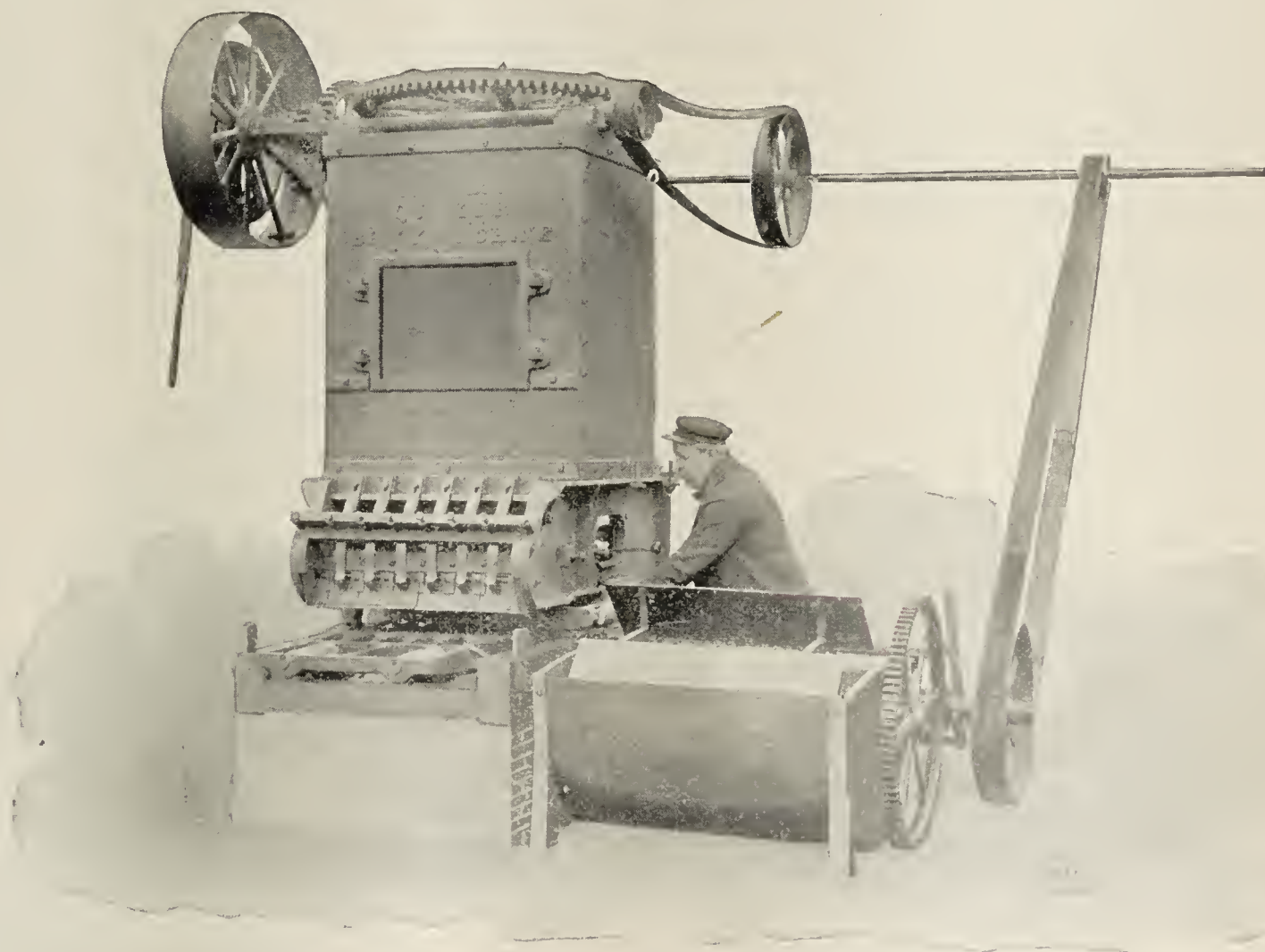
Our Horse= Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE. At Bargain Prices.

Odd sizes of moulds. Have not been used.
 5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
 20 moulds, $8\frac{13}{16} \times 4\frac{3}{16} \times 2\frac{7}{16}$. 9-16 in. partitions.
 17 hand moulds (3's) standard size.
 Second-hand, but used a few days only.
 10 moulds, $9\frac{1}{2} \times 4\frac{9}{16} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
 19 moulds, $9\frac{1}{2} \times 4\frac{5}{8} \times 2\frac{9}{16}$. " "
 16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.
 16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitions.
 10 moulds, standard size.
 19 moulds, $9 \times 4\frac{1}{8} \times 2\frac{1}{2}$.

**The Wellington
Machine Co.,
WELLINGTON,
OHIO.**

Send
for
Circular.

See ad. on page 263.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

tioned among the local manufacturers according to an agreed scale. Brick have sold very low in Cleveland during the past season, and the manufacturers hope by this means to maintain living prices at least.

The Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., are putting in a complete outfit of the steam power machinery for the Craig Colony, of Sonyea, N. Y., a large State institution for the employment of their abled-bodied male patients.

The Hudson River Shale Paving Brick Company has been organized to manufacture brick at Jersey City, N. J. J. F. Harris, of Catskill, N. Y., and R. W. Turner and J. M. White, of Mt. Vernon, N. Y., are the incorporators. The capital stock is \$250,000.

The Christiana Brick and Tile Company, of Philadelphia, is putting in its new plant a Ross-Keller six-mold machine. This company will make only the very finest grade of front brick, Roman brick, etc. The works of the company are being put up at Stanton, Del.

At a recent meeting of the stockholders of the Springfield (Ill.) Paving Brick Company the following board of directors was elected for the ensuing year: A. L. Converse, Edward D. Keys, John L. Mason, S. D. Scholes, J. F. Miller, G. J. Little and Herman Pierik.

George E. Bredt has leased the Yriestra brickyard, near Bohemia, Fla. He will at once put in new machinery, increasing the capacity to 25,000 brick per day, and otherwise improve the product. The new firm will be known as the Bredt Bros. Brick Company.

The Saginaw (Mich.) Clay Company expects to double its present capacity this spring, and will operate to its full capacity. They expect to be able to turn out 45,000 brick daily, and to find a ready market for them, as building operations in that vicinity are booming.

Mr. James McCleaster's Sons, of Harrisburg, Pa., enterprising young brickmakers of that place, have added an additional outfit of Martin machinery to the plant furnished them by the Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., a year ago.

Lucius Carter, of Coal Bluff, Ind., writes: "I am going out of the brick and tile business, and therefore do not need the Clay-Worker any more. Am getting too old to carry on the business. However, your journal is all right. It is by far the best paper published on the clayworking industries."

The first report of paving brick statistics ever compiled in Iowa, just completed by Prof. H. Foster Bain, Assistant State Geologist, shows that nearly 80,000,000 paving brick were made and sold in the State during 1897. The average price was a little more than \$4.50 per 1,000, the total value being \$390,000.

Robert Dyas and J. I. and W. L. Jones have organized a brick company at Huntsville, Tenn. They have purchased the old plant of Fulcher & Dyas at East Huntsville, and will put in new and modern machinery. They will make a specialty of fine pressed brick, and have a capacity of 25,000 brick per day.

In sending in subscription to Clay-Worker, Daniel Storrs, chief engineer Kansas State Penitentiary, Lansing, Kan., writes as follows: "We have a five-foot vein of fire clay, cheap fuel, cheap labor, A No. 1 shipping facilities, and we think it will pay some one with money to investigate this. We can give a guarantee that there will be no strikes in this mine, as we have convict labor."

Land is being surveyed by M. B. Cowden, City Engineer of Harrisburg, Pa., and plans drawn by William E. Connelly, of the same place, for an immense brick works at Mt. Holly, Pa., where it is expected a high-grade white and light-colored brick will be turned out. The plant will be equipped with modern machinery. It is estimated the entire cost of the plant will be \$40,000. The firm will be known as the Mt. Holly Brick and Clay Company.

A NATURAL CONCLUSION.

"Spurt advertising, like a short-winded race horse, never wins the race," says the Age of Steel. "Just as well move your store every three months as to do spurt advertising. People may not need what you sell just now, but they will sooner or later, and if when they do want it they don't find your advertisement where they first saw it, they will naturally conclude that you have quit business. What a salesman is to your business, just such is your advertisement. Each sells your goods, and you cannot prosper without both."

PACIFIC COAST NEWS.

THE CONTRACT for the gray terra cotta and gray brick for the six-story Wells, Fargo & Co.'s Express Building, now being erected in San Francisco, has been awarded, Gladding, McBean & Co. The new five-story Young Building now going up at the corner of Market and Spear streets will also be equipped with gray brick and terra cotta by this firm. The former contract is about \$35,000 and the latter about \$12,000. This is about the most important work secured in some time, the general run of business being low.

William Hosford, President of the Hosford Fire Brick Co., at Great Falls, Mont., has joined the gold-seekers and gone to the Klondike.

Riggs & Robinson have the contract for burning 200,000 brick for the Creamery Company at Tempe, Ariz.

The manufacture of pottery, one of the important industries of Portland, Ore., is experiencing a revival just now, for the first time in five years. R. T. Prael, of the Pacific Pottery Company, that city, says that the prospects for the Northwest trade are very bright. He says: "Business is better than it has been for five years. We have orders coming in at a rate that enables us to keep the works going. Our chief line is dark-glazed stoneware and flower pots. Trade generally has been lifeless for a long time, but it is in such shape now that the year's business will be very good indeed."

Micelli Brothers, of Roseburg, Ore., have secured the contract to furnish 400,000 brick for the new Coos county courthouse at Coquille City.

George W. Atkinson is erecting a brickmaking plant to meet the requirements of the coming season at Nogales, Ariz., as is also Mr. James Butler.

At a recent meeting of the Board of Directors of the Stockton (Cal.) Art Pottery Company it was decided to resume business in all departments of the factory, including the decorating rooms. At the February meeting of wholesalers and jobbers in pottery, held in New York, according to Mr. Hopkinson, who is now in the East, it was shown that the Stockton pottery has absolutely no competitor in its specialty of Rekston ware, and that there is a healthful demand for it, especially for certain lines. The meeting of dealers with the representative of the Stockton works was naturally of great benefit to the local industry, as it was thus learned exactly what classes of wares and what styles of decoration are most in vogue and in demand. Orders were secured for over \$20,000 worth of goods. This resumption of work is encouraging all round.

M. J. Fleming and E. J. McLean, of Red Lodge, James Newton, of Joliet, and Thomas Forman and E. J. Thomas, of Helena, Mont., have started to open up a coal mine north of Joliet. The roof is sandstone, while beneath the vein is a splendid quality of fire clay, and the gentlemen interested, all of whom are practical miners, think they have struck it rich.

A new business venture is shortly to be started in Redding, Cal. Edward Frisbie, President of the Bank of Northern California, and S. Hill are going to establish a brickyard. Orders for over a quarter of a million of brick have been received already.

Thomas Lester has just completed a large kiln of brick at his brickyard, near Nogales, Ariz., including 53,000 large ones for the extension of Captain Mix's new building on Morley avenue, Nogales, Ariz.

Conrad J. Houghttines, a member of the firm of Houghttines Brothers & Goss, prominent brick manufacturers and contractors of Tacoma, Wash., died recently while on the operating table in that city. Mr. Houghttines's death probably resulted from apoplexy or fatty degeneration of the heart.

SUNSET.

IMPROVEMENT AT TOLEDO.

Editor Clay-Worker:

Enclosed find check for \$2 for one year's subscription to the Clay-Worker. At present trade is fair for this time of the year, and the prospects are that 1898 will be an unusually good year. I mean by that the deliveries should equal '91 and '92. The first half of '97 the deliveries were at the lowest point in quite a number of years, July being the lowest average. Each month since then shows some improvement, until the deliveries have again reached a normal condition. The actual amount of brick delivered in December was larger than in July. All the above applies to the trade of the whole city. Brick are now selling for \$4.25 common, \$4.75 hard, \$5 sewer, 25 cents per thousand off for cash.

THE COLLINGWOOD BRICK CO.

Toledo, Ohio.

The MONARCH

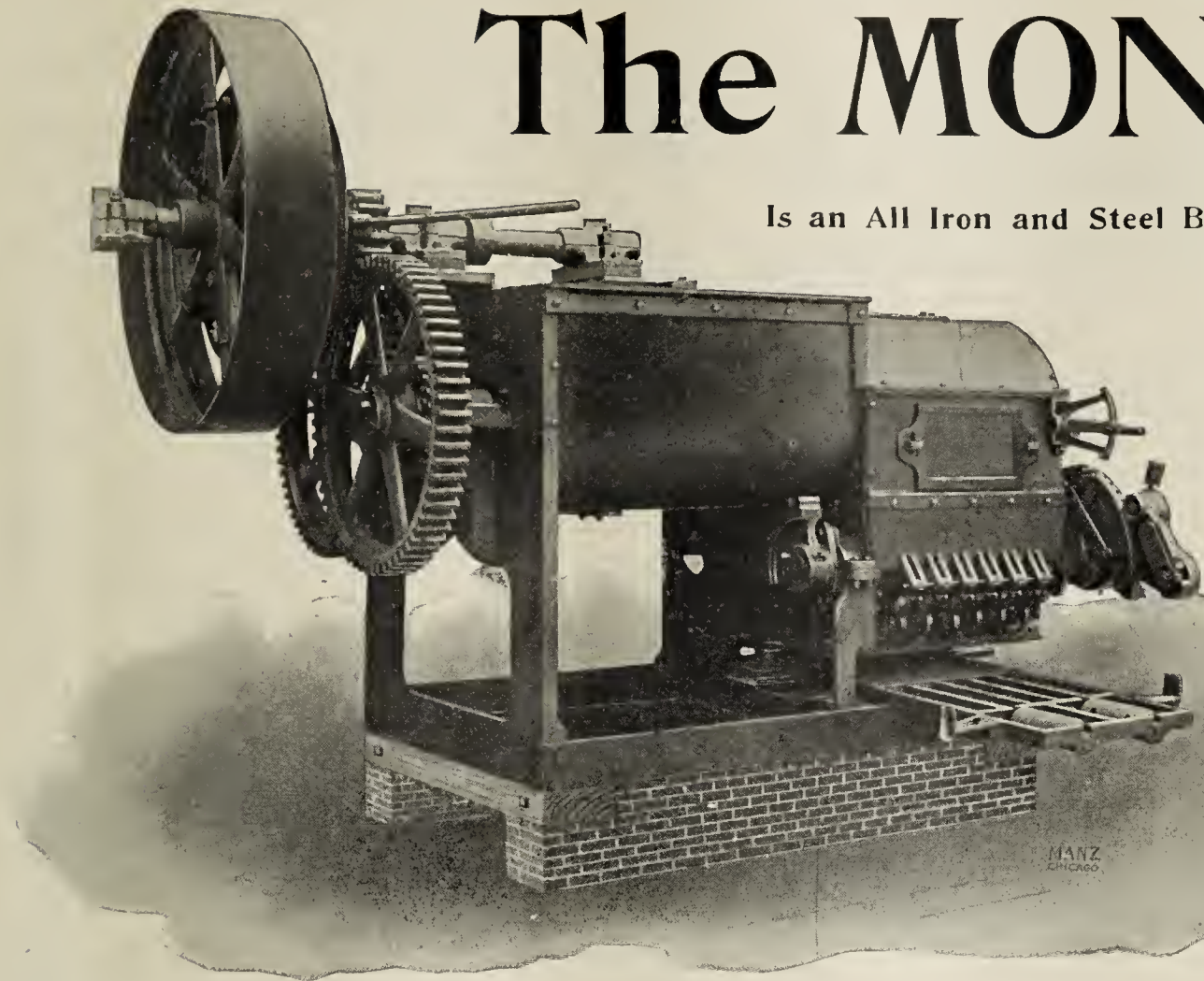
Is an All Iron and Steel Brick Machine with

Double
Pug Mill.

...

SIMPLE
IN CON-
STRUCTION,
DURABLE
AND . . .
POWERFUL.

...

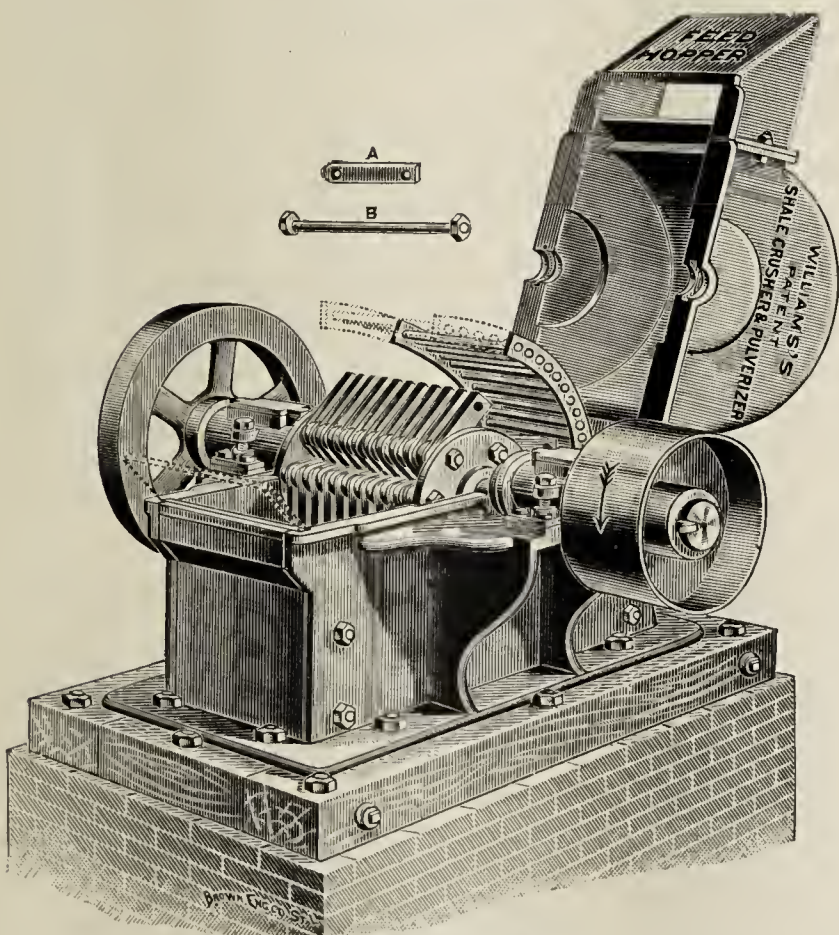


Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER**. Engines and boilers. Send for 1898 Catalogue.

JAMES W. HENSLEY, Successor to **S. K. FLETCHER**, Indianapolis, Ind.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

A Clay Pulverizer of Wonderful Capacity.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

Our Pulverizer is Fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



Office of **HYDRAULIC PRESS BRICK CO.**

St. Louis, Mo., October 30th, 1897.

MILTON F. WILLIAMS, Esq., City.

Dear Sir;—Enclosed please find our order No. 125 for one No. 2 Pulverizer. In a few days, or as soon as our drawings are completed, I expect to give you an order for two more. We have three of your Pulverizers now running, giving perfect satisfaction. We are able to grind clay to any degree of fineness by making very slight changes in the machine. They have been running several months without repairs worth considering.

Yours truly,
HYDRAULIC PRESS BRICK CO.,
W. N. Graves, Gen'l Supt.

HOTEL BERNARD, Wagner, Ind. Ter.

WILLIAM'S PATENT CRUSHER AND PULVERIZER CO.,

Dear Sirs:—The Pulverizer we bought of you sometime ago is a dandy, we would not exchange it for any grinder we know of. Keeping it in repair costs nothing to speak of. Wishing you every success, we are

Yours respectfully,
TAYLOR & RAINS.



These machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known. Will guarantee them under any and all circumstances.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.

2705 North Broadway, **St. Louis, Mo.**

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.

STAINING BRICKS.

It frequently happens that a builder has to build an addition to some brick building already up, and it also happens that he cannot procure bricks to match the old bricks in color. To get over this difficulty he is compelled to use bricks available and render them the color of the old bricks by staining, or staining the old bricks to correspond with the new. There are several methods—all good—of staining bricks, and for the benefit of those builders who may require to employ one or other of the methods, we submit the following: To make a good, durable red stain, mix Indian red or Venetian red with a solution of good Portland cement, regulating the color by adding a little Spanish brown if necessary. Mix with this fine sand, washed clean and dried before being added to the solution. Cement and sand may be used in equal proportions. The mixture is to be a little thinner than ordinary paint. It must be stirred while being used, and applied with a brush. Another red stain, which is easily applied, looks better than the first, but lacks durability. Take as follows and in proportion to amount required: One ounce of glue melted in one gallon of water, add a piece of alum the size of an egg, then a half pound of Venetian red, and one pound of Spanish brown. Try the color and mix more light or dark to suit. For a buff or cream color use any yellow mineral paint, such as yellow ochre, adding a mineral white to make it light if necessary. For black, use asphaltum heated to a fluid state before applying. Bricks should be stained black before being laid, and the best way is to make the brick moderately hot, then dip them about one inch in the melted asphaltum, and leave them to dry before being used. This makes a good, durable job, if they are held in the mixture for a moment or two, in order that the color may have an opportunity of being absorbed to the depth of a sixteenth of an inch. Another method of staining bricks black is to mix together asphaltum and linseed oil, and heat the mixture until it will mix together well. Heat the bricks and dip them in the mixture, where they should remain for a short time. The best way to stain black is to have a flat pan over a fire; fill the pan until it has about an inch in depth of the mixture. Place in the pan as many bricks as it will hold, then take out the first brick and replace it with another. Put the stained brick on a board or a clean spot to dry; then take out the second brick and put another in its place; and continue this operation until brick enough are stained, minding to keep up the supply of asphalt and oil.—Canadian Architect.

WANTED—Good pressed brick setter and sorter. 3 2 d Address BOX 23, Lehigh, Iowa.

FOR SALE—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 1 tf d JESSE T. MORGAN, Wilkes-Barre, Pa.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED—Forty double-deck dry cars; width of gauge 24-inch. Must be in good condition. (2 tf d) E. & H., care Clay-Worker.

FOR SALE CHEAP—One horse-power Wiles brick machine; two tempering wheels in good condition. KELLY & MOREY, 3 1 c Troy, N. Y.

FOR SALE—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN, Room 13 Palmer House, Chicago, Ill. 3 t f d

WANTED—Situation as foreman or burner, up or down-draft kilns; fire brick, shale pavers, soft mud, dry press, shingle tile. (29) Twenty-nine years experience. References. Address "BUSINESS," 3 1 c Care Clay Worker.

WANTED—A position as superintendent of a brick plant. Soft mud, stiff mud or vitrified, by a man possessing executive ability, and a thorough knowledge of the business. Address M. J. 3 1 tp c Care Clay-Worker.

TO RENT—Brick yard; two Martin machines, fully equipped and ready with small outlay to start manufacturing. No competition. Present owner would assist in the management. Address W. H. ODELL, 3 1 c Brookville, Canada.

FOR SALE AT A BARGAIN—One Penfield Upright Soft Mud Brick Mill with Clay Crusher, Elevator and Pug Mill, with all fixtures. Used but a part of one season. Good as new. Address J. W. W., 3 3 cm Care Clay-Worker.

WANTED—Situation as Superintendent or Foreman of brick works. Practical in every detail. No. 1 burner, up or down-draft kilns, dry or stiff clay process. Address SUCCESS, 3 tf 125 P. Care of Clay-Worker.

FOR SALE—One 4-foot 8-inch Wilkes Grinding Pan; one 8-foot Wilkes Grinding Pan; one 100 horse-power boiler; also Porcelain Sagger and other clays mined from our own banks. SALAMANDER WORKS, 3 1 dm 39 Cortlandt st., New York City.

BRICK PRESSES FOR SALE—One nearly new 3 mold Brewis Brick Press, used one season, \$1000.00; one Ditto, used three seasons \$800.00; one nearly new Steadman Pulverizer, \$250.00. All in good condition. Address 2 3 dm GERNERT BROS LUMBER CO., Cor 6th, Hill and A Sts, Louisville, Ky.

FOR SALE—Licenses to erect patented Kilns, continuous, continuous and single combined, connected up and down draft and muffle kilns. For burning fire, paving, building, common and other brick, pipe, terra cotta, etc. Large or small plant. DUPLEX KILN CO., 3 1 cm Perth Amboy, N. J.

FOR SALE CHEAP—One new Henry Martin letter A steam brick machine, never used. One all iron Talcott; four hand presses, one Dry Pan, one 20 H.-P. Portable Engine and boiler; one Potts sander, elevator chain, flange wheels and a lot of moulds. Address C. & L. MERRICK, 3 2 d Syracuse, N. Y.

FOR SALE—I will sell the whole or a one-half interest in one of the best equipped Dry Press brick plants in Pennsylvania, 90 miles from New York City and 400 miles from Philadelphia. Capacity 10,000 per day; two mold Boyd Press, 9 ft. (Fisher) grinding dry pan, 60 h. p. engine, two 60 h. p. boilers, 49 cars, steam dryer, 3 down draft kilns (capacity about 75,000 each) three beds of clay, from which red, buff or white brick can be made. Plant new and complete and can make brick the year round; can be making brick in two hours. Plenty of brick on hand to show color and quality, investigation solicited. Call on or address JAMES EDINGER, 2 2 dm Stroudsburg, Monroe Co., Pa.

WANTED—A combination man, for burning and setting dry press brick, cutting drain tile on Brewer machine. Eudaly down and up-draft kiln. Must be strictly sober, best of reference required. Address GLADBROOK PRESS BRICK & TILE CO., 3 1 c Gladbrook, Iowa.

FOR SALE CHEAP—One second-hand Quaker brick machine, guaranteed 25,000 per day; also one J. I. Case Portable Engine, 12 H.-P., in good running order. Reason for sale, bought a 50,000 capacity outfit. Particulars on application. EAST GRAND FORKS BRICK CO., 3 1 cm Grand Forks, N. D.

FOR SALE—We will sell a part interest or the whole of our Paving Brick and Tile factory. Will give a good liberal deal as we cannot give it the attention necessary. For full particulars address LEHIGH BRICK, TILE & MFG CO., 3 3 dc Lehigh, Iowa.

FOR SALE CHEAP—One Second-hand, double die Columbian Repress; practically as good as new. One Quaker Horse-power Brick Machine, in good order. One Monarch Brick Machine, only used one short season. All in running order. THE HORTON MFG. CO., 1 tf L. Painesville, Ohio.

FOR SALE—To a practical brickmaker, a large or small interest in Vitrified Brick Plant, located in the city of St. Louis. Must be thoroughly competent to take the active management. Quality of shale unsurpassed. Home market for entire product. Rare opportunity for right man. Address H. R. WHITMORE, 3 1 d 417 Pine street, St. Louis, Mo.

FOR SALE CHEAP—One Penfield Plunger brick machine, capacity 50,000 per day; price, \$150; one Disintegrator, consisting of two Rolls, Bar and Chain Beaters, Hollow Boiler Iron Hopper for steam heat, price, \$150; one pair of Penfield Steel Rolls 24 by 36 inches, price \$125. Address GEO. H. DOWNING, 3 2 cm Kearney, Neb.

WANTED—Position as foreman or burner by reliable man. Has 24 years experience in making brick (13 years in Germany, 11 years in America). Firm with dry press, stiff mud and soft mud process. Up-to-date in operating of down-draft continuous and up-draft kilns. First-class references. Address MISSOURY, 3 1 c Care of Clay-Worker.

FOR SALE—Very cheap and on easy terms, owing to death of proprietor, one of Virginia's best equipped and located brick yards. Has a capacity of 90,000 building brick, located on water front, and also has good rail facilities, abundance of good clay and cheap fuel. A money making plant for any good brickmaker. For full particulars address H. B. BOOKER, Administratrix, 2 3 d Hampton, Va.

FOR SALE—Brick and Drain Tile plant. Railroad switch to factory; completely equipped; clay suitable for making the finest china ware, as well as fire brick, front brick, sewer pipe, common brick, etc. Everything new and in perfect order. Now behind on orders. Located in a prosperous community; no tile factory within 150 miles and 300 miles of territory in one direction to work. Requires only a man who understands the business to make a great success. This property will be sold at a bargain and must be sold at once. Only those meaning business address, E. R. H., 3 1 dm Care of Clay-Worker.

TO PRACTICAL BRICKMAKERS AND CAPITALISTS.

TO BE SOLD—The whole or half interest in the two best brickyards within hauling distance of the city of Vancouver, B. C. The brick are preferred to all others, there is demand for all you can make at the best prices, which averages seven to eight dollars on the yard. Apply to J. W. BURNET, 13th ave. Mt. Pleasant, Vancouver, B. C. 3 tf 5p

FOR SALE.

24,000 32 by 10½ inch Pallets at 1¼c each. Racks for same at one-fourth cost price. One Grand Automatic Brick Machine..\$110 One Double Geared Pug Mill..... 50 One Potts Sand Moulder..... 50 Barrows and Pallet Trucks very cheap. Machinery in good condition. Prices f. o. b., Salem Ohio. Address "SALEM," 3 1 2p Care Clay-Worker.

BRICK MACHINERY

Wonder No. 4.
Capacity, 60,000 to 100,000 per day.
Big Wonder.
Capacity, 50,000 to 60,000 per day.
Intermediate Wonder.
Capacity, 25,000 to 40,000 per day.
Little Wonder.
Capacity, 20,000 to 25,000 per day.

BRICK CUTTERS

Cunningham's Side Cut Automatic Cutter.
Cunningham's End Cut 3-Stream Automatic Cutter.
Cunningham's End Cut 2-Stream Automatic Cutter.
Cunningham's End Cut 1-Stream Automatic Cutter.
Side Cut Broad Delivery Table.
Hand Brick Cutting Table.
Combination Side and End Cut Hand Brick Cutter.

PUG MILLS

No. 3, Plain Closed Top Pug Mill.
No. 3, Open Top Pug Mill with Wallace Patent Cleaner Teeth.
Tempers clay for 75,000 to 100,000 brick per day.
No. 2, Open Top Pug Mill.
No. 2, Closed Top Pug Mill.
Tempers clay for 35,000 to 50,000 brick per day.
No. 1, Open Top Pug Mill.
No. 1, Closed Top Pug Mill.
Tempers clay for 25,000 to 35,000 brick per day.
No. 1, Wallace Patent Pug Mill.
No. 2, Wallace Patent Pug Mill.
Tempers clay for 20,000 to 40,000 brick per day.

DRAIN TILE MACHINERY

Little Wonder Makes 3 to 12 inch.
Capacity, 8,000 to 12,000 4-inch daily; others in proportion.
Intermediate Wonder Makes from 3 to 18 inch.
Capacity, 10,000 to 15,000 4-inch daily; others in proportion.
Drain Tile Cutting Tables for large and small tile
Trucks for Handling Large Tile.
Reversing Device for large tile.

CLAY PREPARING MACHINERY

Dry and Wet Pans, 6, 8 and 9 feet, with wood and iron frames.
Clay Screens.

Clay Crushers and Stone Separators of many designs and capacities to suit conditions.
Clay Elevators all lengths and widths to suit your desire.
Dry Clay Bucket Elevators of length and breadth to suit desires.

Friction Hoisting Drums.
Friction Geared Hoisting Drums.
Clay Cars. Truck Wheels and Axles.
Kiln Doors and Frames.
Kiln Doors without Frames.
Wheelbarrows for Brick and Tile.
Brick Pallet Spring Trucks.
Engines. Boilers. Pumps.

Shafting, Pulleys, Hangers,
Couplings, Journal Bearings and
Belting, both Rubber and Leather.

A Long Argument



IS NOT NECESSARY TO CONVINCE PRACTICAL BRICK-MAKERS OF THE MERITS OF OUR MACHINEERY. OUR SUCCESSSES PROVE THAT. . . .

A Case in Point

Is that of the Burnham plant in Milwaukee where we were reported to have made a failure. Under date of October 26th, '97, Mr. John F. Burnham writes:

“You guaranteed the **Big Wonder** to make 50 M brick per day; as a rule we have been able to better that amount by several thousand, and running under favorable circumstances have made as many as 80,000 a day, and you know our clay is very difficult to work. In fact some have said it could not be worked successfully by the stiff clay process—but the **Wonder Machine** is doing it.”

Mr. Burnham's equipment including Granulator, Compound 4-Roll Crusher, Pug Mill, Big Wonder Machine and Cunningham's Automatic Cutter was all furnished by us, and is entirely satisfactory.

Need we say more?

If you want anything in the line of clayworking machinery. Don't fail to get our prices.

Wallace Mfg. Co.

Frankfort, Indiana.

CHICAGO AGENTS:
CHICAGO BRICK MACHINERY CO., Chicago, Ill.

See Ad. on Page 299.

THE TROUBLES you have with your clay, machinery or kilns, can be remedied. Consult the **TECHNICAL ENGINEER**, 12 tf l care Clay-Worker.

FOR SALE CHEAP—100 iron, wood-top dryer cars and 10 to 15 thousand wood pallets, used in connection with ears. All in first-class condition. Address **PHILADELPHIA**, 13 d care Clay-Worker.

FOR SALE—At your own price. Penfield Upright Stock Brick Machine; independently geared Pug mill. Machine good as new. A great bargain. Address **CEDAR FALLS BRICK & TILE CO.**, 22 d Cedar Falls, Ia.

FOR SALE.—Half or whole of well-equipped brickyard in prosperous district and near the busiest 8,000 town in northern Michigan; steam power, 20,000 a day. Address **"BRICKYARD."** 13 cm 432 S. Jefferson, Saginaw, E. S., Mich.

FOR SALE—Brickyard at St. Johnsville, N. Y., complete with down-draft kiln, Freese & Co. Pug mill Auger Machine, boiler and engine, barrows, sheds all complete for business and abundance of blue clay; on easy terms. Must be seen to be appreciated. Inquire of **ROTH & ENGELHARDT**, 23 cm St. Johnsville, N. Y.

FOR SALE—Brick and tile plant in the South; R. R. switch to kilns, soft and stiff mud machines, Sharer dryer. Clay good for front brick and fire proof wares. Growing market from wide and prosperous territory. Will sell entire plant, or machinery alone. Will sell part interest with management to right man. Address **G. P. ORENDORFF**, 2 tf c Lacon, Morgan Co., Ala.

FOR SALE—One nearly new 4-mold Boyd Dry Press brick machine; one 4-mold Eureka dry press brick machine; one No. 2 Worrell clay dryer; one 48-inch Ross disintegrator; five second-hand horizontal boilers, 15 and 16 ft lengths, 3-inch tubes, ranging from 50 to 60 h. p., 5 and 6 foot diameter; one straight line engine, 14 x 14 cylinder, nearly new, a No. 1 order; 8 fans, 7 ft. diameter, good as new. Will be sold very low. Address **C. SIEDLER, Pres.** 2 tf dm 156 Fifth Ave., New York.

FOR SALE.—A complete Brick Yard Outfit, consisting of an A Special E. M. Freese & Co., Galion, O., stiff mud machine, crusher, disintegrator, winding drum with 300 feet of wire cable, clay cars with complete set of shafting, pulleys and being capable of turning out 25,000 bricks a day; also a ten-track Wolff's Chicago steam drier with 165 brick cars, complete with trucks for storing of empty cars, transfer cars, turntables, all ready for immediate use, and can be had at a bargain by applying in person or by letter to **J. A. BLAFFER**, River Front and Austerlitz st., New Orleans, La. [31 d]

BRICK YARD BRUNSWICK, MO., FOR SALE OR LEASE.

Creagers Grand Automatic machine, pug mill, disintegrator, 24 ft. elevator, Raymond No. 1 Repress, 30 h. p. Atlas boiler and engine, 12,000 fence lath pallets 9½x36, dry sheds, Clamps, 5 barrows, 5 spring off-bearing trucks, 6 wing dump table. All guaranteed a No. 1. Will sell any part. **P. H. BEAZLEY**, Administrator, 312p Brunswick, Mo.

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, ¼ screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
1 Barr Pumping Company steam pump.
1 Chambers Bros. Company brick machine.
All new or little used, and in excellent condition. **WALNUT**, 1 tf d Care Clay-Worker.

FOR SALE.

Two 8-foot dry grinding pans, under gear pan.
One 8-foot, under geared, iron frame wet for wood work.
One new 5-foot wet pan for wood frame.
One Potts stock brick machine.
One Potts sanding machine.
One 7-foot horizontal pug mill.
Two vertical pug mills.
Large lot of steel and iron pallets.
Twenty pallet cars.
One 30 H.-P. horizontal tubular boiler.
Lot of boilers, tanks, etc.
THOMAS CARLIN'S SONS, 11 12 c Allegheny, Pa.

FOR RENT—Desirable brick yard on James River, Va., equipped for business. 22 dm **T. F. ROGERS**, Norfolk, Va.

FOR SALE—20,000 second-hand, 32-inch pallets, 2 cents each, F. O. B. cars Wabash. Address, 22 cm **THOS. BRIDGES' SONS**, Wabash, Ind.

FOR SALE.—One of the best paying brick and tile factories in Iowa; part pay in good land. Address, **PATTON & MUNSON**, Lock Box 11, 11 tf dm Lohrville, (Calhoun Co.) Iowa.

FOR SALE AT A BARGAIN.—One 4-mold Boyd dry press brick machine in perfect condition. **THE FERNHOLTZ BRICK PRESS CO.**, 8 tf l St. Louis, Mo.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer. **T. W. CARMICHAEL**, Inventor and Manufacturer, 6 tf d Clarksburg, W. Va.

BRICK PLANT FOR SALE—Well equipped with latest improved machinery, which is new. For particulars inquire of the **DANVILLE FIRE BRICK CO.**, 23 c Danville, Pa.

H. W. CLASSEN & CO.,

CHAS. H. CLASSEN, Proprietor.

Manufacturers Agents, for sale of Sewer Pipe, Fire, Pressed and Paving Brick, Clay Products, etc. Correspondence invited 305 McElderry's Wh'f (Long Dock.) Box 8, Builders' Exchange, 33 e Baltimore, Md.

ENGLISH PLANS FOR PLASTIC BRICK WORKS.

Complete sets including general plan and elevation of works.

Plans and sections of machine room.

Plans for Dryer heated with waste gas from boiler.

Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.

Prices on application to

BENNETT & SAYER, Derby, England.

NOTICE. Permanent Injunction and an Accounting.

A decree for a perpetual Injunction and an accounting, in the suit in the United States Circuit Court at Cleveland, against J. W. Penfield & Son, has been recently entered, and an **INJUNCTION ISSUED**, restraining the surviving defendant, Raymond C. Penfield from infringing our Patents No. 275,467 of April 10th, 1883; No. 297,671 of April 29th, 1884; No. 297,675 of April 29th, 1884 and No. 362,204 of May 3rd, 1887 (the wheel cut-off.)

CHAMBERS BROTHERS CO., Philadelphia, Penn.

Dry Pan— Clay Crushers.

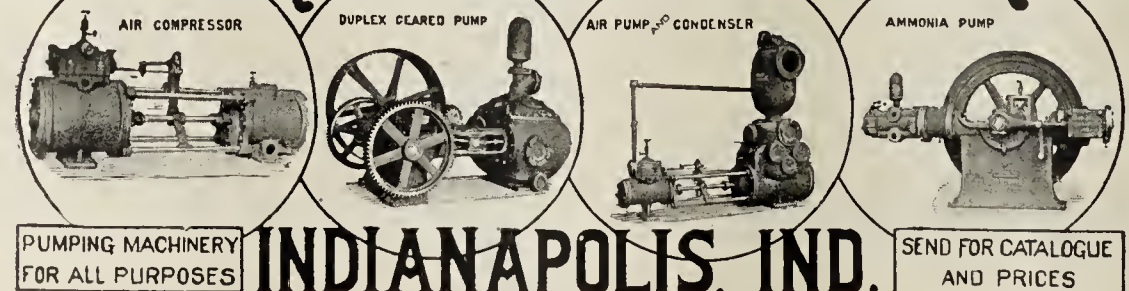
CLAY SCREENS AND ELEVATORS.

....

Eagle Iron Works,

Des Moines, Iowa.

DEAN BROS' STEAM PUMP WORKS.



FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

The PERFECT CLAY SCREEN.

Always Clean.

Perforations always open.

Separates the clay to full size of perforation

It is simple, durable and effective.

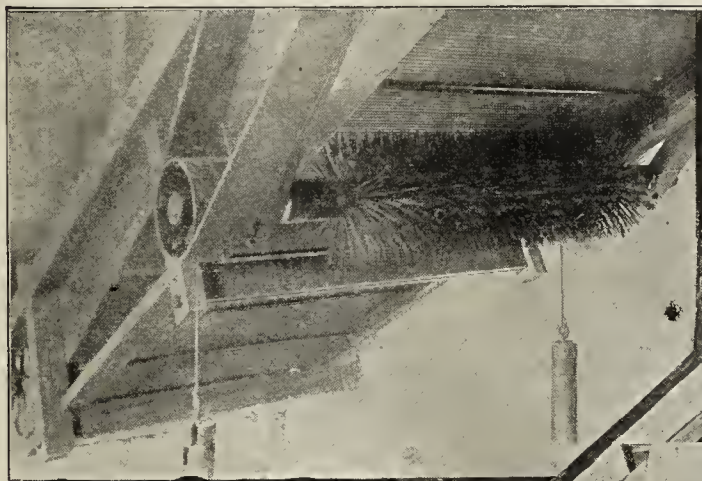
Impossible to clog or paste it over.

Especially adapted to moist clay.

Purchaser takes no risk.

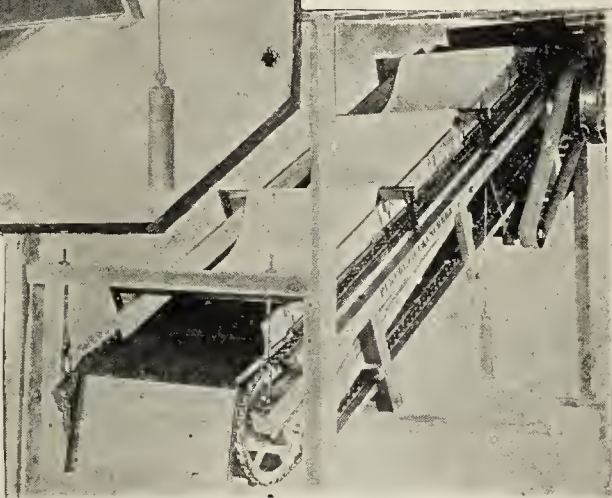
Satisfaction guaranteed or no pay.

... Write us for full information ...



View on underside showing action of Rotary Brush

HAS NO EQUAL.



ELDER & DUNLAP,

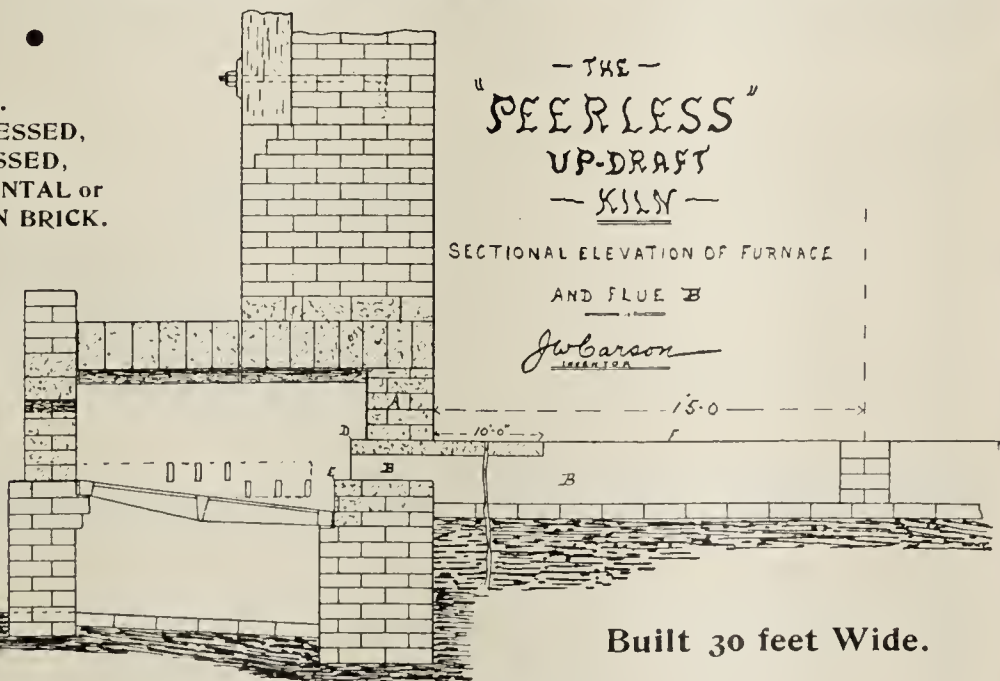
Bloomington, Ill.

The "PEERLESS" UP-DRAFTKILN.

For Burning....

DRY-PRESSED,
RE-PRESSED,
ORNAMENTAL or
COMMON BRICK.

Write for
Circulars,
Testimonials or
Information on
Economical
Burning to



Built 30 feet Wide.

J. W. CARSON, LaPrairie, P. Q., Can.

FOR SALE CHEAP.

One second-hand, double die Columbian Re-press; practically as good as new.
One Quaker Horse-power Brick Machine, in good order.
One Ten Horse Power Portable Engine, in good order. THE HORTON MFG. CO.,
1 tf 1 Painesville, O.

A GREAT CHANCE FOR A PRACTICAL BRICKMAKER.

A brick plant situated near Anniston, Ala., (this city now again coming to the front), and there will be a demand for bricks in 1898; for sale, or will lease to a practical brickmaker on easy terms. We have the finest clay in Alabama for common, red press and buff bricks, jugs and terra cotta, etc. Address JNO. M. ELLIOTT,
1 tf 4 pm Easton, Md.

Study Law at Home.

An opportunity for ambitious young men to take up the study of law without neglecting the business of earning a living. You can live at home while preparing for admission to the bar. We require only your evenings and guarantee as thorough a legal training as may be had at any law school in America. Write at once for our special offer to new students.

Indianapolis College of Law,
80 When Building, INDIANAPOLIS, IND.

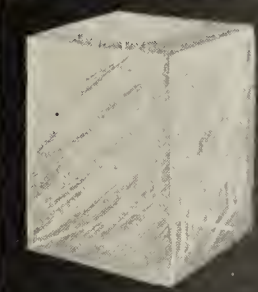
A. F. TENNILLE'S

Bureau of

**News and
Legislative
Information,**

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.



IT CUTS

Some ICE

the kind of "CUTS" you use;

Poor ENGRAVINGS will spoil your catalogue or advertisement.

WE MAKE THE GOOD KIND.

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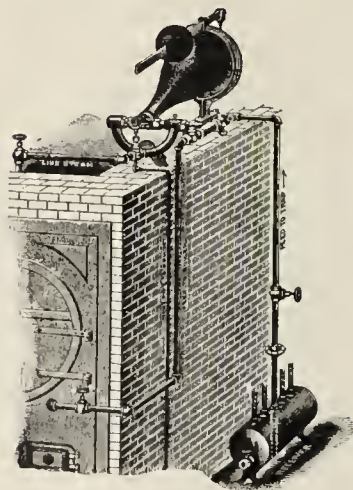
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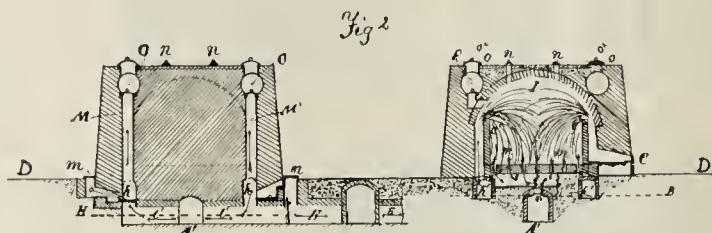
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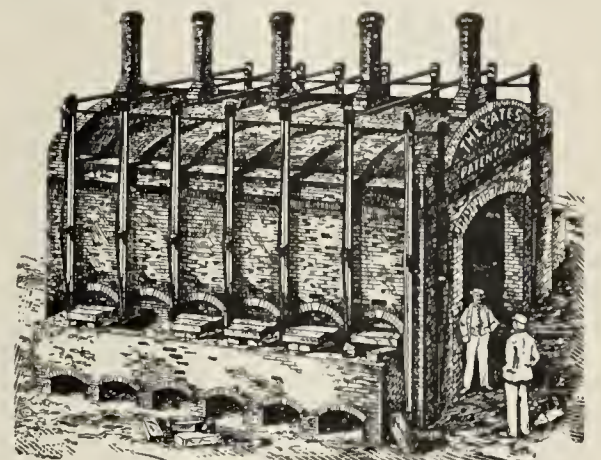
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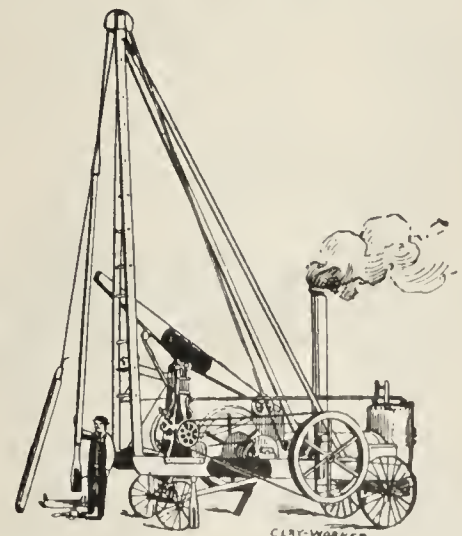
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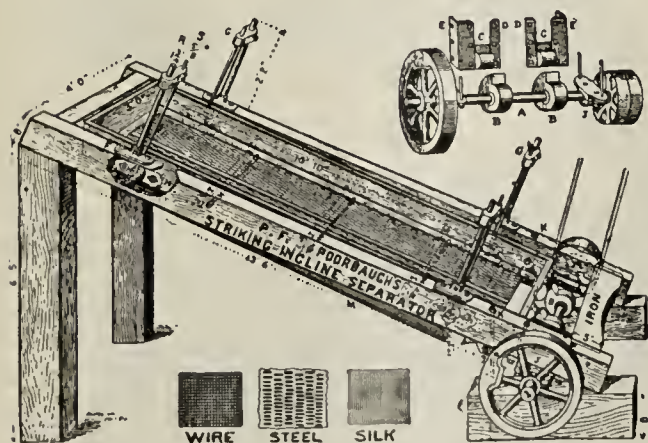
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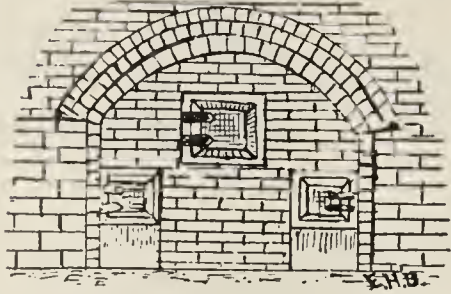
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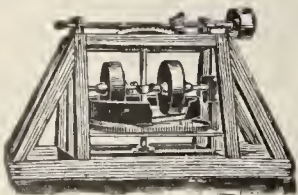
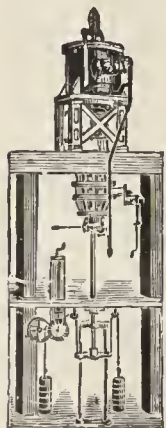
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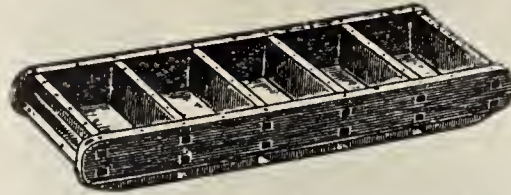
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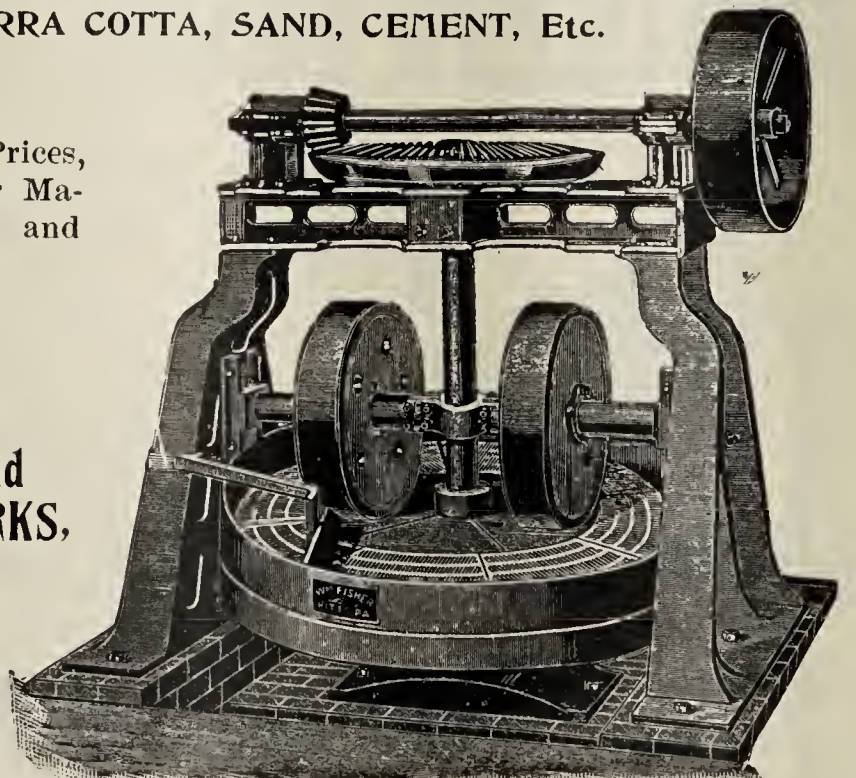
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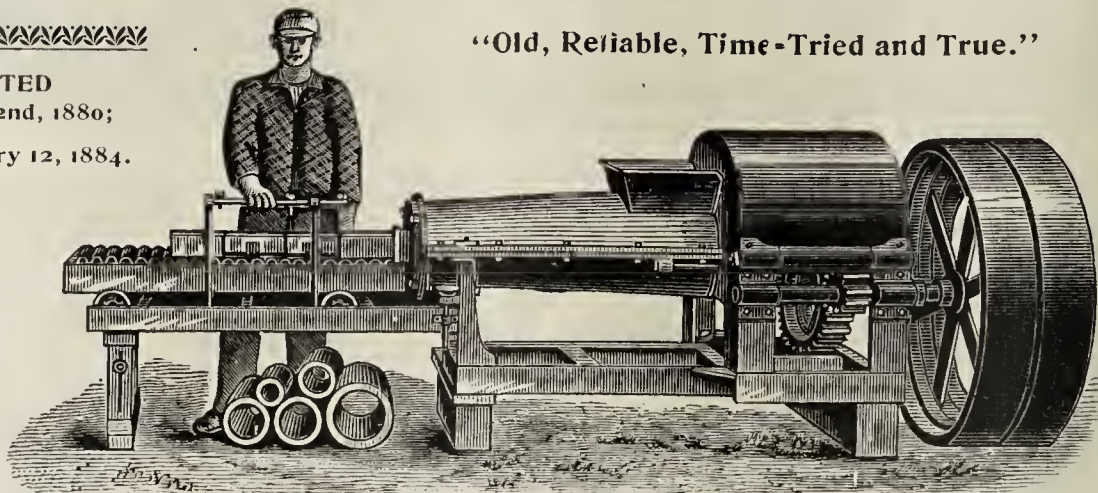
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To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

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PATENTED

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THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the backs and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

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We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

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SOMERSET ENAMELED BRICK CO.,

By Warren H. Sanford, Agent.

BRISTOL COUNTY, SS. Nov. 22nd, 1897.

Then personally appeared Warren H. Sanford above named and made oath that the foregoing statement by him signed is true.

[SEAL]

Before me,

J. C. BLAISDELL, Notary Public.

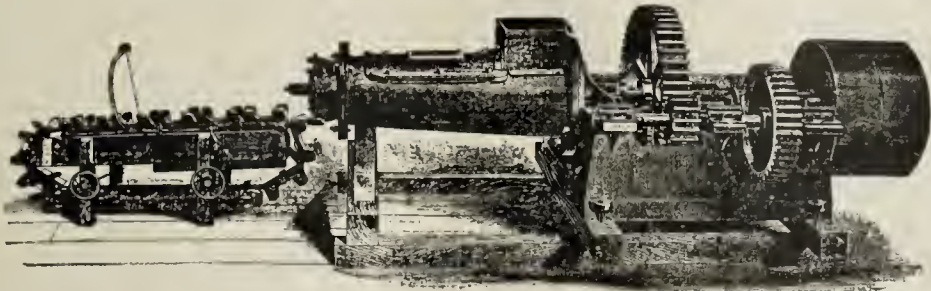
S. G. PHILLIPS, Agent and Patentee, 161 Grand Street, Rahway, N. J

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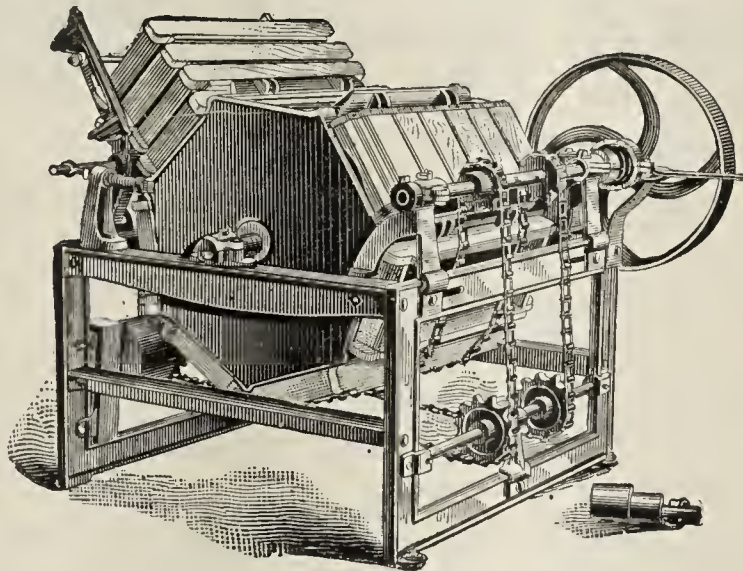
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No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the mold riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,

Manager and Sole Agent,
HAVERSTRAW, N. Y.



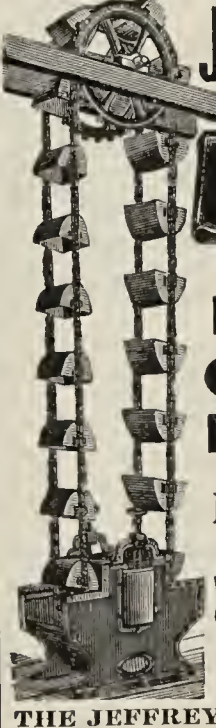
The case of Newton vs. Buck, has again been decided, February 4, 1898, by Judge Cox, in the United States Court, holding that Newton is the owner of patents, Nos. 284,115; 301,087; 272,698; and 407,030, and has the exclusive right to manufacture machines under these patents, and entitled to an injunction against Buck and all persons claiming through or under him, from making, using or selling the Buck machines, and for damages for past infringements. This is absolutely the end of the long litigation between Newton and Buck and every point is decided in favor of Newton.

We own and control nine patents, and all sanding machines employing either the cylinder or the feed rack, infringes some one or more of these patents, and all persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages against all infringements.

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CLAY,
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No. 20 Passenger..... 7:00 a. m.
*No. 22 Passenger..... 1:20 p. m.
No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
No. 23 Passenger..... 2:50 p. m.
No. 25 Passenger..... 6:20 p. m.
*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
A. H. SELLARS, Agent,
Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

**TAKE THE
BIG 4
TO
ST. LOUIS**

The "New South" Brick Machinery

Built for Business.

Has won over a number of others, in actual service, in the past. We expect to make it continue to win in the future.

• • •

GREENVILLE, S. C., Sept. 23rd, 1897.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Since putting in your "Xtra" machine with automatic cutter I have the brick business of this city all to myself. I made 112 in one minute this morning, and can make 50 M any day of 11 hours. The bricks are dandies.

Yours very truly,

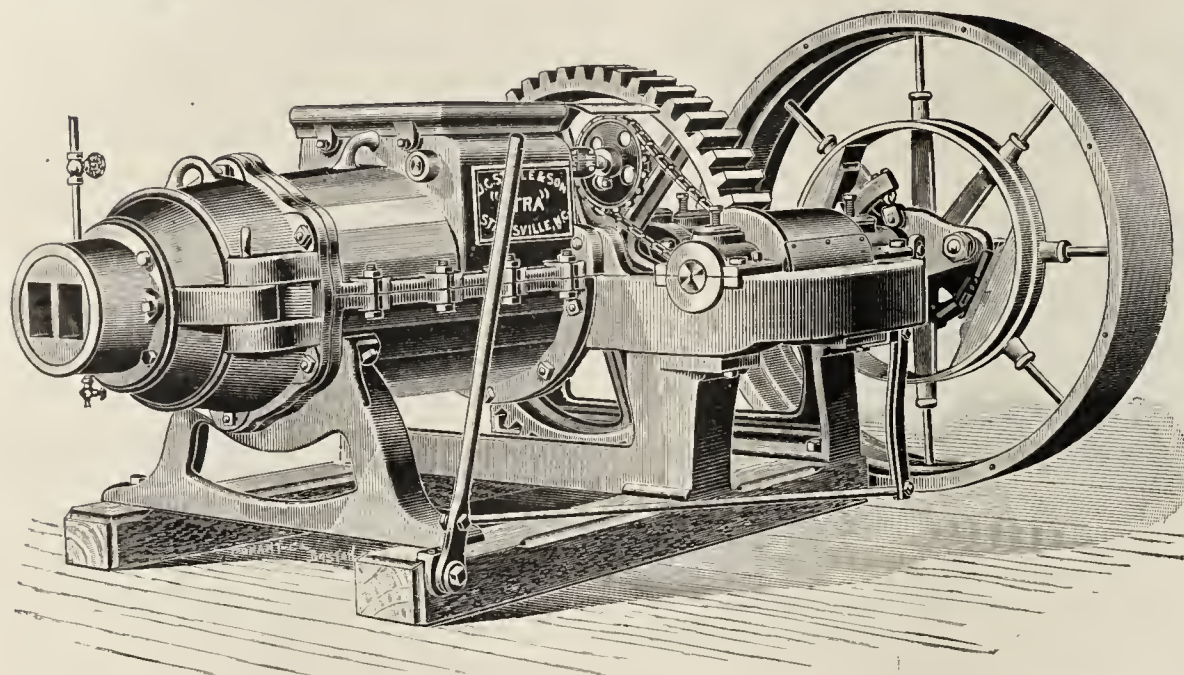
THOS. J. HANNON.

Mr. Hannon took out another machine that was almost new, and put in our "Xtra." We do not claim 50 M per day for this machine, but this is what our customers say that it will do.

• • •

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.



X-tra Machine. Capacity 25,000.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

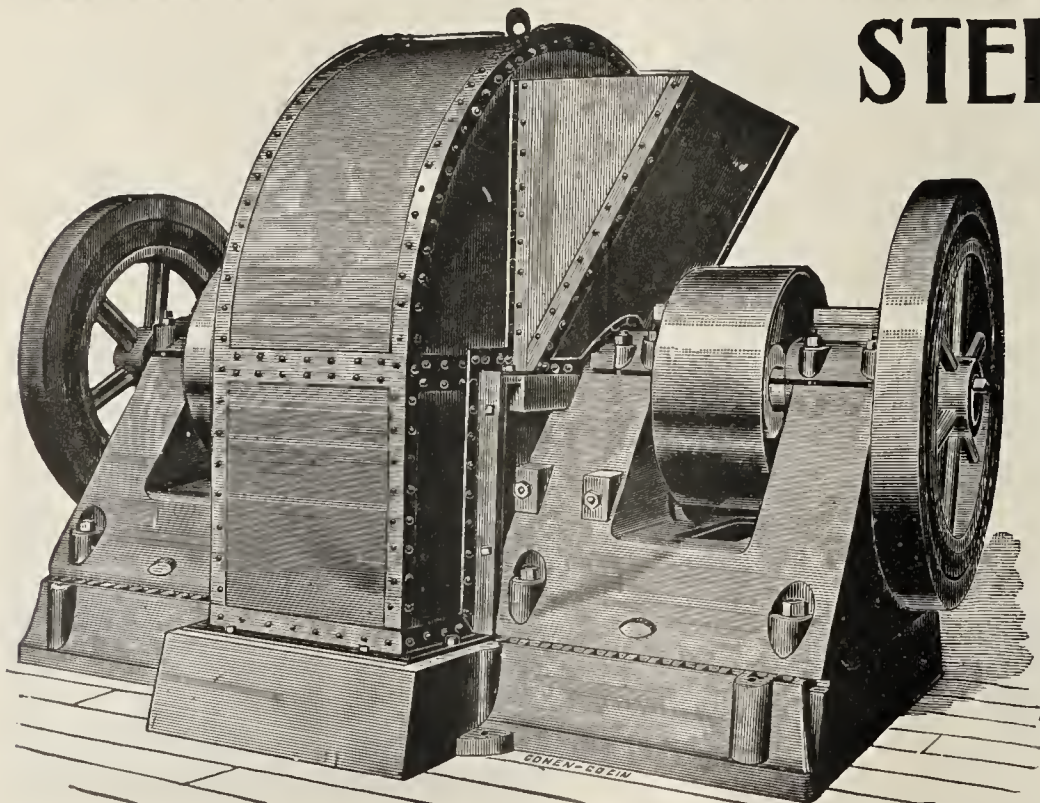
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

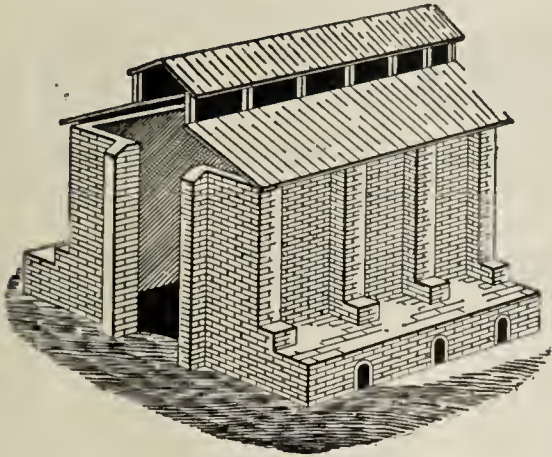
Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

LOUIS H. REPELL'S IMPROVED-KILNS

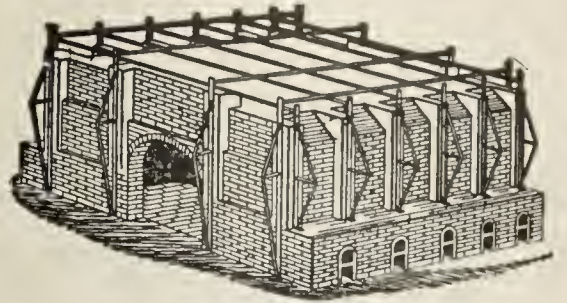
For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

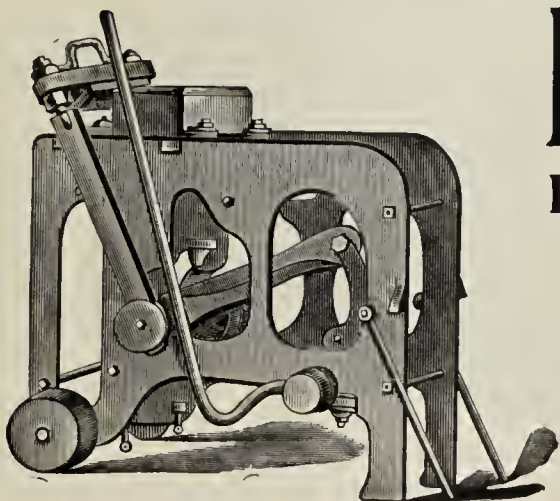
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

Days Brick Works.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,

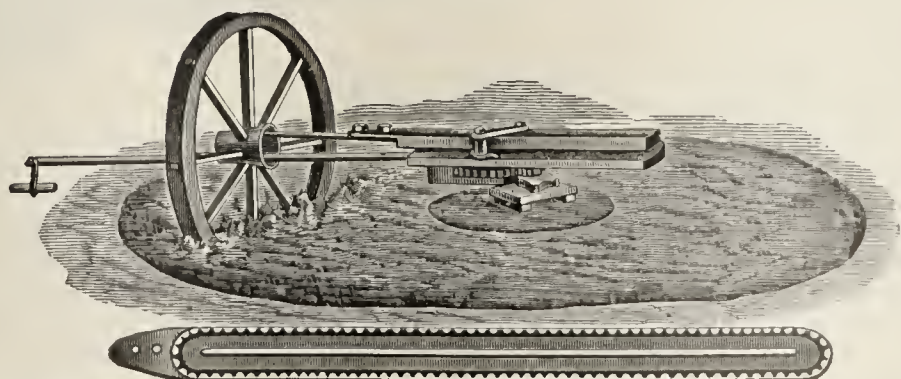
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

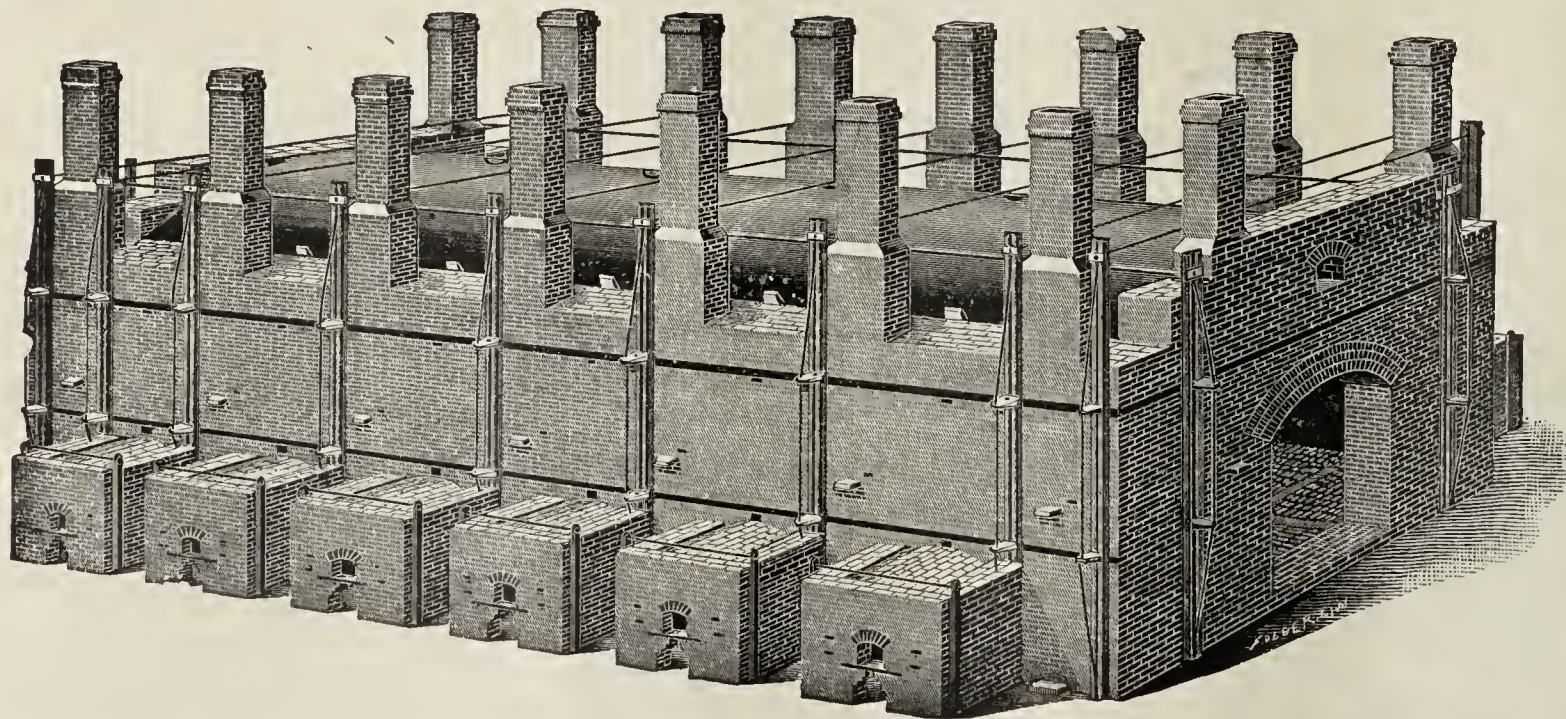
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



WOULD like to show you also my new Kiln Floor for Round or Square Down-draft Kilns. It is a permanent floor, to any one who has to use sand in sanding their brick it is a money saver, a floor can be cleaned in two hours without moving any brick; and fuel is saved in the burning of the product, and a great deal of annoyance saved in leveling etc., for dry pressed and other high grades of brick.

Address **H. HAIGH, Catskill, N. Y.**

The Lehmann ^{Portable Continuous} Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

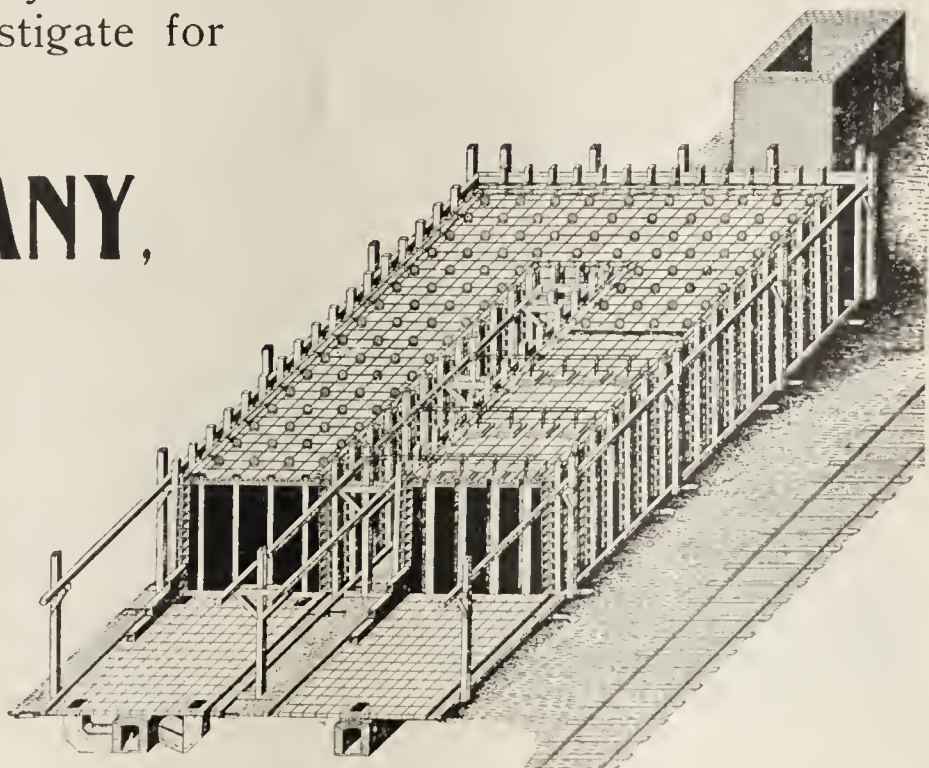
F. LEHMANN & COMPANY,

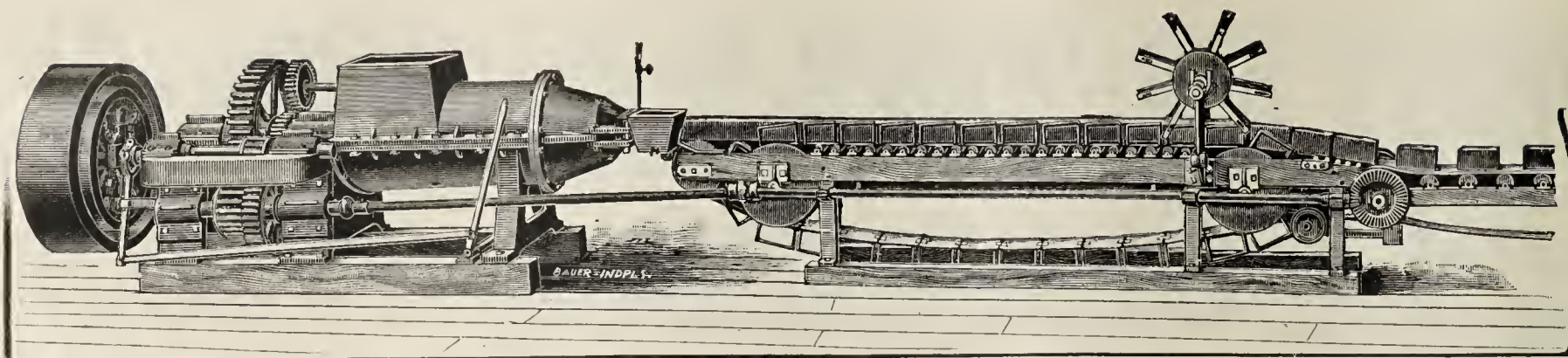
Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,
Plans and estimates furnished for Brick, Lime and
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.





Office of **MATTES BRICK COMPANY,**
Building and Paving Brick.

Decatur, Ill., January 22nd, 1898.

LEADER M'FG. CO., Decatur, Ill.

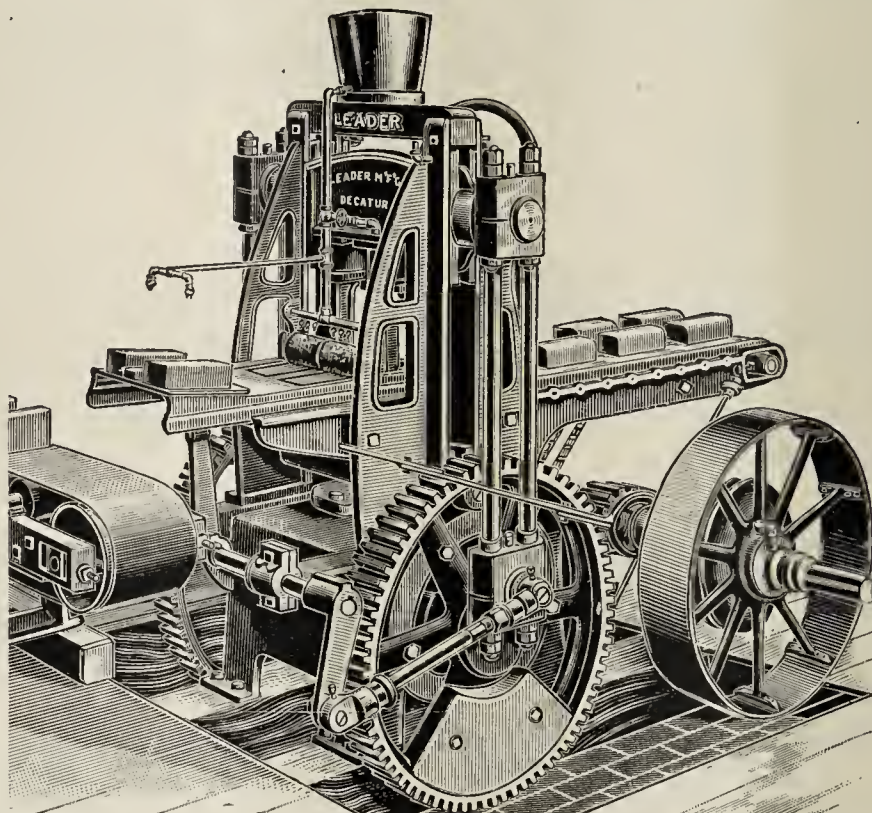
Gentlemen:—After having repressed about one million brick on the two LEADER REPRESSES you furnished us last Summer, we are pleased to bear testimony that they are beyond a doubt the most perfect working press we have ever seen. They are simple and strong in construction, run easy and perfect in every test, and no time is ever lost by them.

Hoping you may have the success you merit with this new machine, we remain,

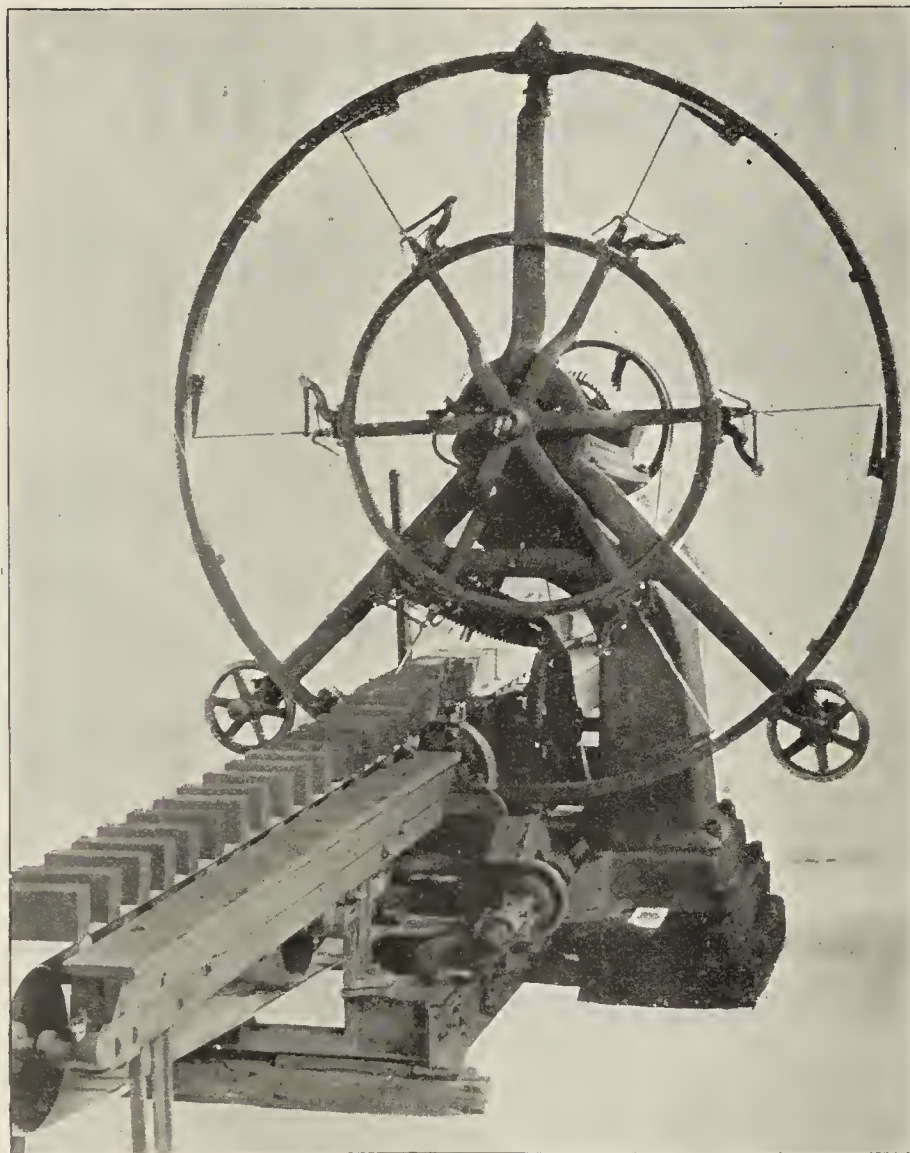
Respectfully yours,
MATTES BRICK COMPANY.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

Leader Manufacturing Co.,
 Decatur, Ill.



Automatic Side-Cutter
For Stiff-Tempered
Brick Machines.



The Chambers Automatic Side-Cutter.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

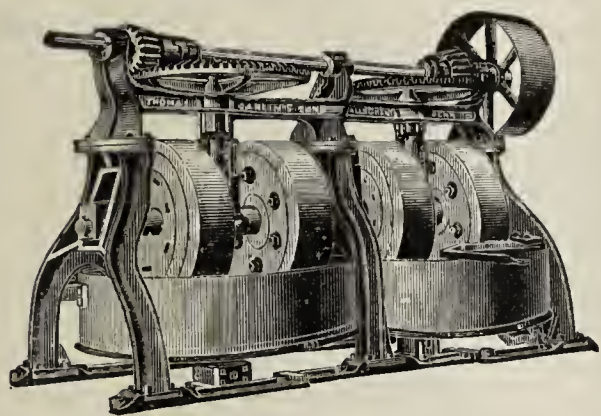
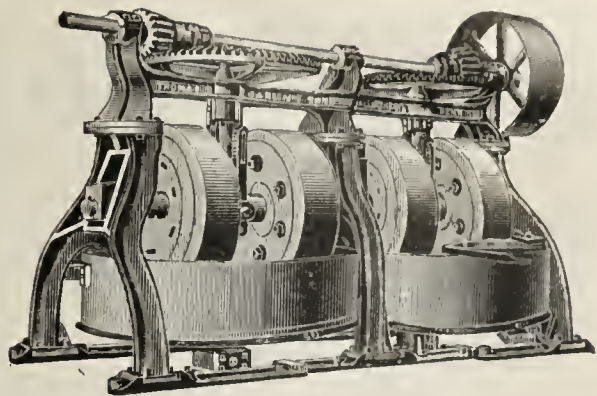
The machinery is above the dirt and all gearing encased.

MANUFACTURED and
 GUARANTEED. . . .

Chambers Brothers Co.,
PHILADELPHIA, PA.

CARLIN'S DRY PANS are

The Best and the Cheapest Dry Pans on the market. They are the **Cheapest** because they are the **Best**. Carlin's Dry Pans are built for service and capacity. Ask those who are using Carlin's Dry Pans and they will tell you they are the **best and cheapest** pans made. We make several different sizes. If you are going to buy a Dry Pan and want the best value for your money don't fail to get our prices and terms.

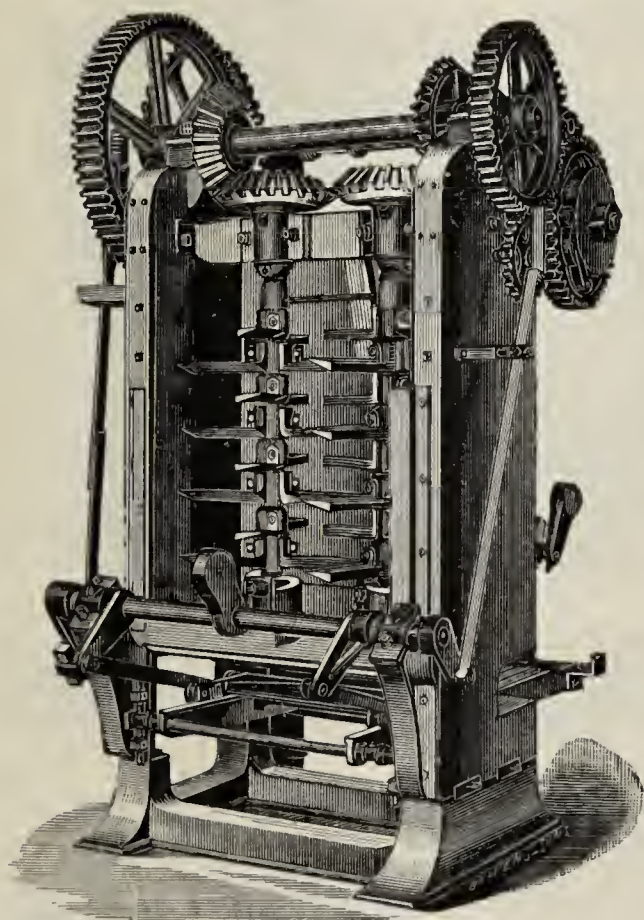


We also sell **Engine Boilers, Pallet Cars, Revolving Cranes, Conveyors, Hoisting Machinery, etc.**

Thomas Carlin's Sons,
ALLEGHENY, PA.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



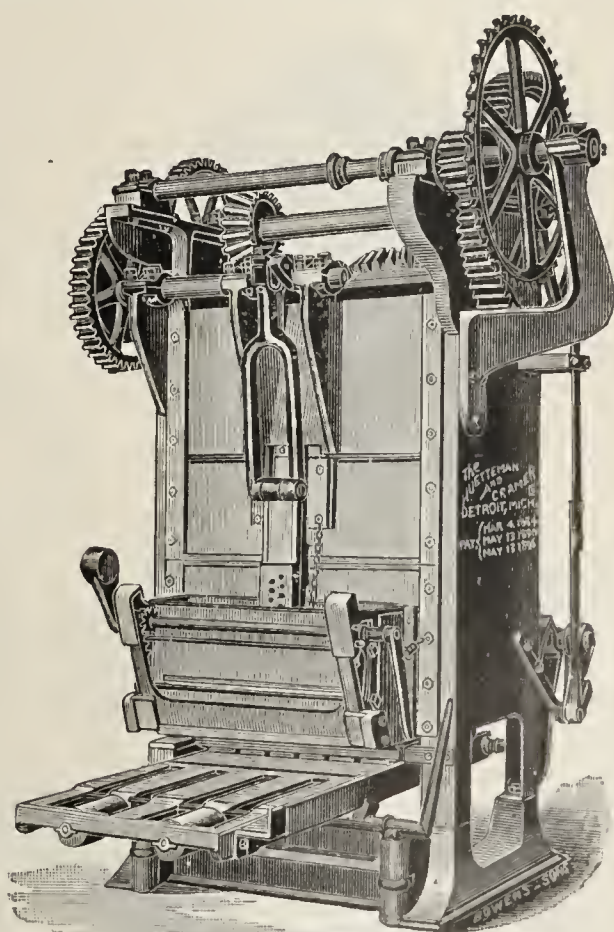
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE
AND PRICES TO

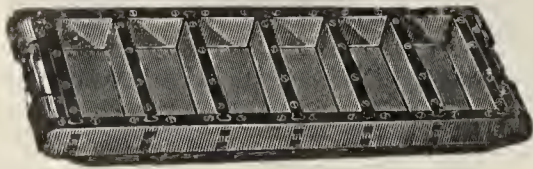
**The Huetteman
& Cramer Co.,**

Manufacturers of the Duplex Brick Machine and general outfit for
brickyards,

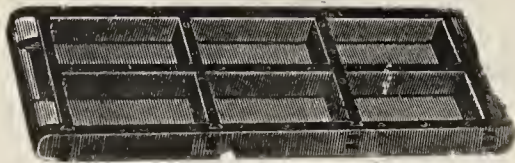
12, 14 & 16 Sherman St.,
DETROIT, - - MICH.



Do YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold.



3 Brick Hand Mold.

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see?"

We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

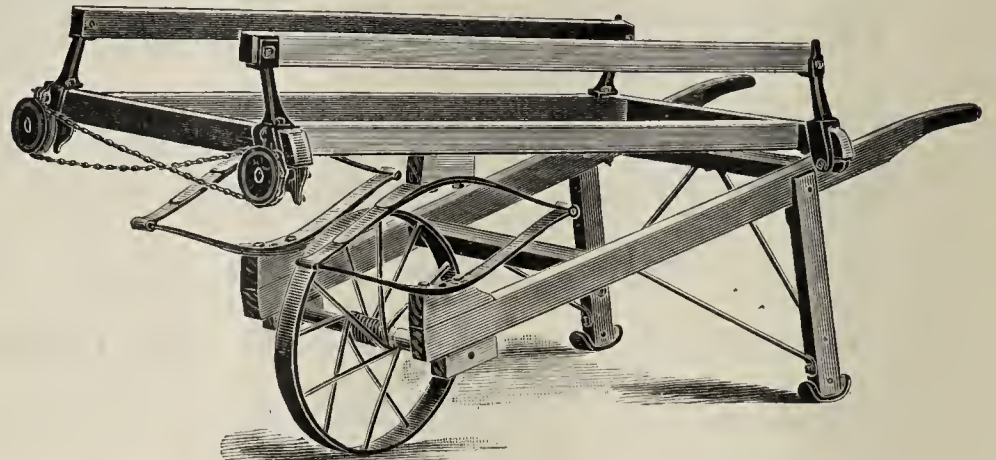
future delivery desired now. We make the best

➔ Moulds, Trucks and Barrows,

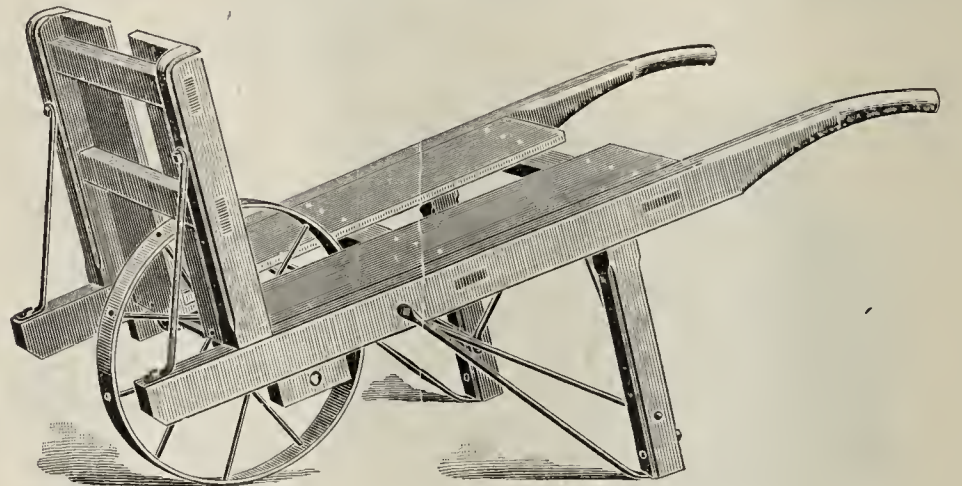
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



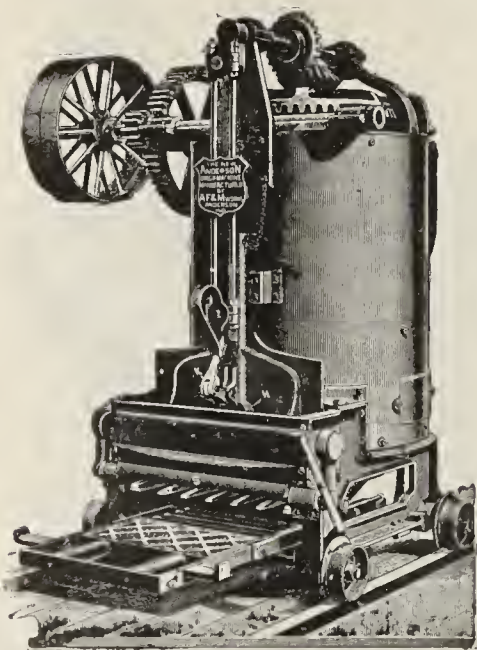
No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

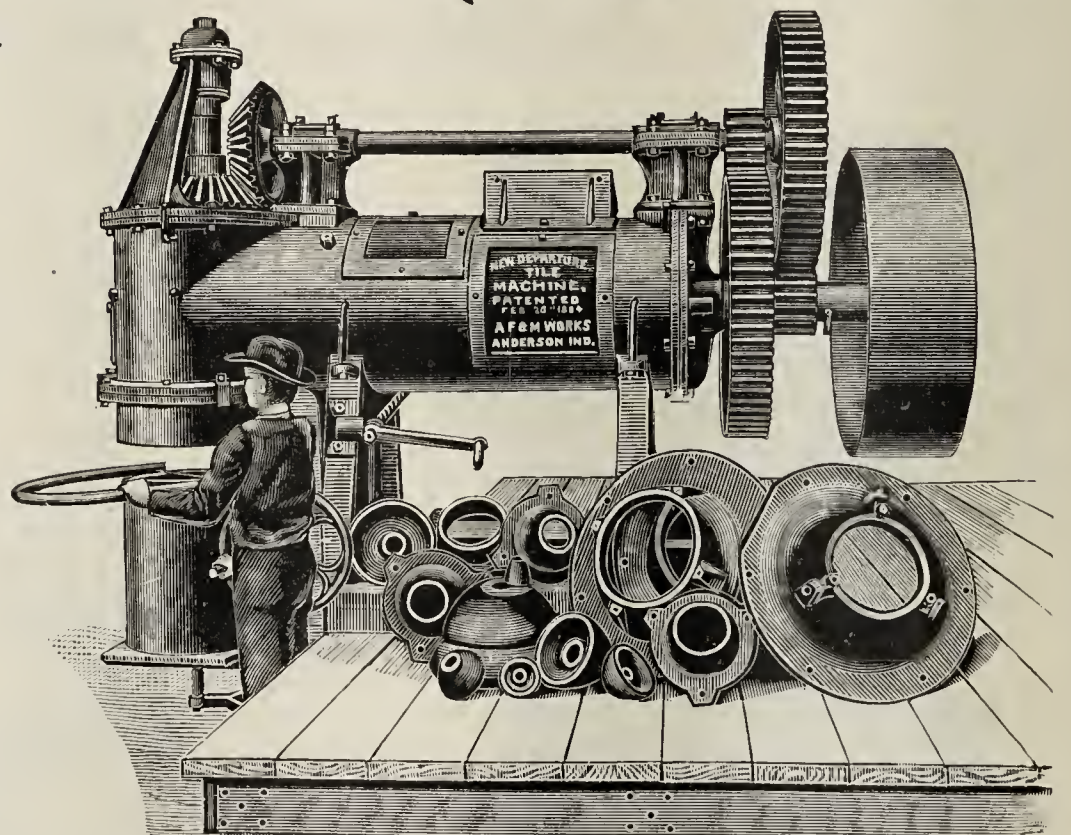
New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

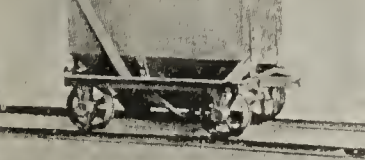
The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana



No. 146. TURNTABLE.



No. 150. STEEL BOTTOM DUMP.



No. 170. STEEL SIDE DUMP.



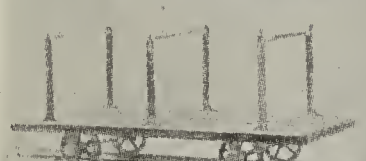
No. 201. OAK SIDE DUMP.



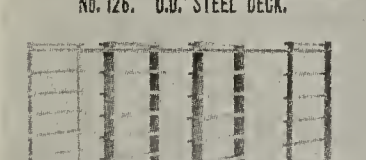
No. 142. TRANSFER CAR.



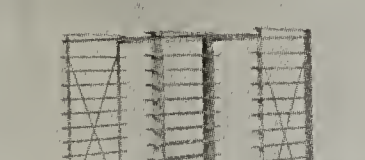
No. 124. DOUBLE DECK.



No. 126. D.D. STEEL DECK.



No. 136. 3 SECTION RACK.



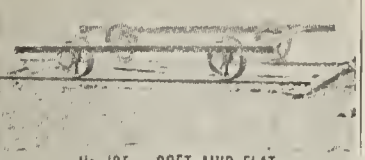
No. 133. SOFT MUD RACK.



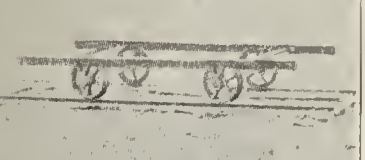
No. 140. BOX SHOCKS, Etc.



No. 139. SHINGLES, STAVES, Etc.



No. 105. SOFT MUD FLAT.



No. 103. STIFF MUD FLAT.



No. 108. FLAT, STEEL DECK.

THE ATLAS BOLT & SCREW CO.,
CLEVELAND, O., U.S.A.

MANUFACTURERS OF

STEEL BRICK DRYER CARS,

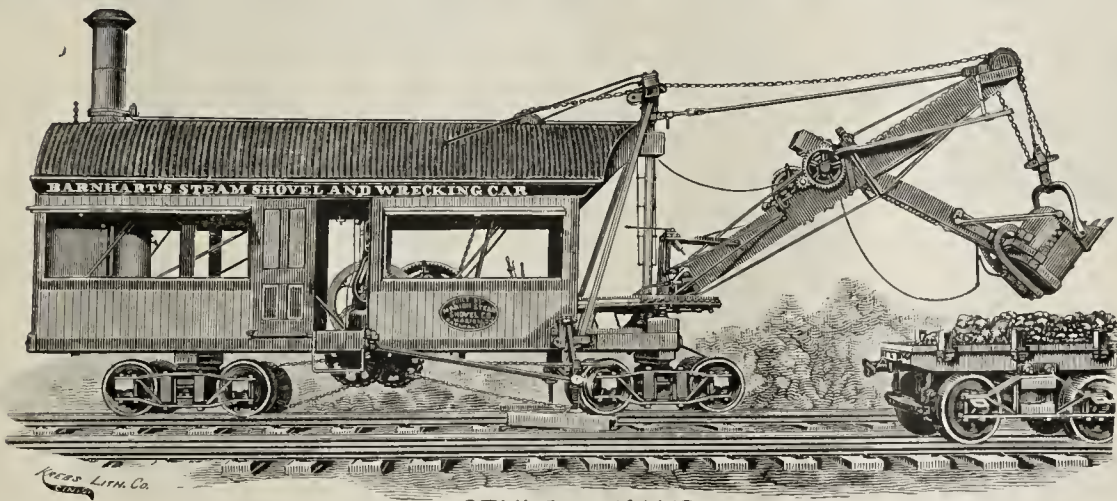
SMALL CARS OF ALL KINDS,

STEEL DRY KILN, LUMBER TRUCKS,

STRONG, LIGHT AND EASY RUNNING.

FULL LINE STEEL WHEELBARROWS.

Steam Shovels for Brickyards.



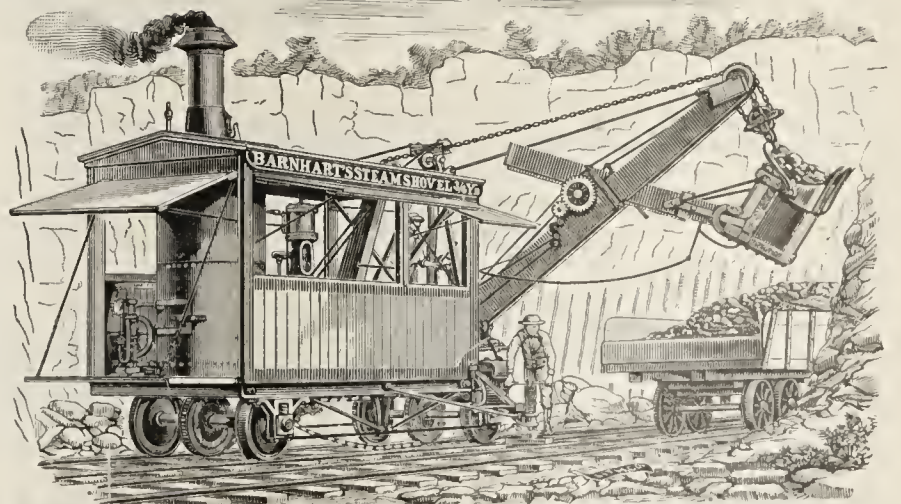
STYLE A-1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,
603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



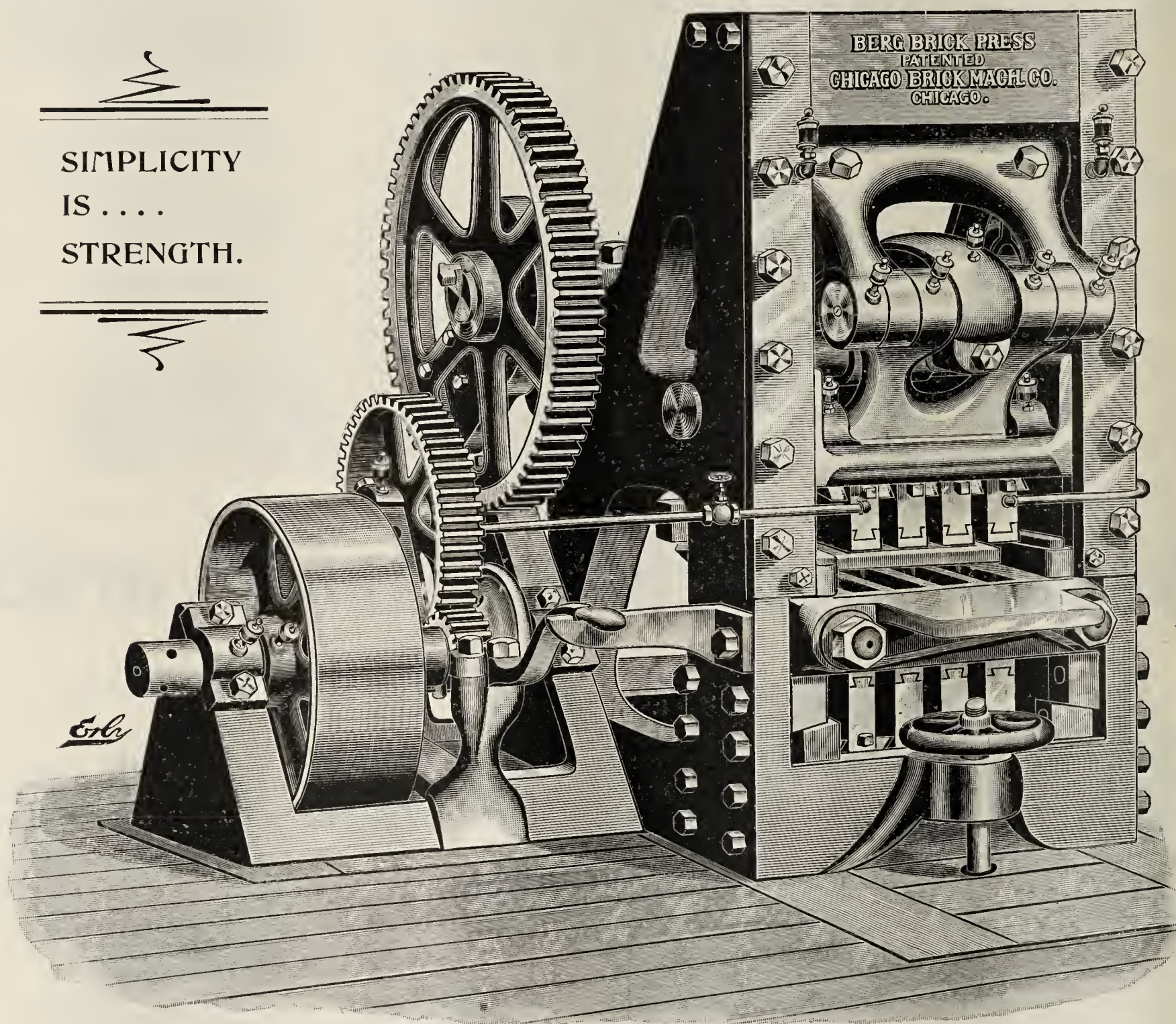
STYLE C-¾ YD.

The BERG BRICK PRESS

Is Pronounced by the U. S. Government—the Highest Development of the Art of Making Brick. . . .

ENTIRELY ORIGINAL IN MOVEMENT.

SIMPLICITY
IS
STRENGTH.



Absolutely Unbreakable.

Fully Guaranteed.

No Experiment, has been running successfully more than a year. Simplest and Strongest of all Dry Presses. Many new features. Send for Circular.

Our Stiff Clay Machinery is just as good in its line as our Dry Press. Most modern in Design and Construction. Makes highest grade of Paving and Building Brick and Drain Tile. Also the latest and highest development of Soft Clay Machinery, combined Disintegrator, Pug Mill and Brick Machine. Only successful down delivery mill for making large tile.

In fact, anything you want—and all Up-to-Date.

CHICAGO BRICK MACHINERY CO., 225 Dearborn St.

GALESBURG....

The Paving Brick Mecca of the World.

— USES THE EAGLE.



GALESBURG, ILL. is the largest manufacturing center of paving brick in the world. Some of the shrewdest and most successful clayworkers operate there. In Galesburg there are 13 Eagle Represses at work. No other repress built has a record of 13 in a single town. The Eagles' superiority gives it precedence here as elsewhere. In Galesburg there are seven Eagles in one factory purchased at different times. No other repress ever built has this record. Here is what Galesburg people say of the Eagle. Send for testimonials of hundreds of other users:

Galesburg, Ill., Feb. 24th., 1898.

The American Clay-Working Machinery Co., Bucyrus, O.

Gentlemen:—Yours of Jan. 26th received. In regard to the Repress I have found it perfect in every respect. I have been using it for the past three years and in no instance has it given us any trouble. I have made from 25,000 to 32,000 brick in ten hours, and can safely say the Eagle Repress is the best repress on the market to-day. Yours respectfully,

GALESBURG VITRIFIED BRICK CO.
Per R. A. Ross, Sup't.

Galesburg, Ill., July 10, 1897.

The American Clay-Working Machinery Co., Bucyrus, O.

Replying to yours asking how we are pleased with your Represses, of which we are using seven, would say that they are giving us the very best of satisfaction, and I doubt if there is any repressing machine made that needs so little care and attention as the Eagle. Outside of the wear on the mold-boxes we have no repairing. I do not recall a single repair we have ordered since the Represses were put in. We are repressing about 100,000 per day, one-third being 3-4-9 blocks.

Yours Truly, PURINGTON PAVING BRICK CO.
Per W. S. Purington, Gen'l Mgr.

Galesburg, Ill., November, 12, 1897.

The American Clay-Working Machinery Co., Bucyrus, O.

You ask, how about the Eagle Represses, and are they doing good work? The Eagle Represses purchased of you in the spring of 1895 have been in constant use, making from 26,000 to 30,000 brick a day each. They run all the time, and I have never known they were in use as far as any demands being made for repairs. I don't know how I can say anything more to your satisfaction than that you have never had a cent from us for repairs in all this time. The product is first-class, and is being placed in the most traveled parts of such cities as Chicago, St. Louis, Minneapolis, etc., and are pronounced superior to all. You will never get rich in selling new machines to Galesburg, as they never need repairs or wear out. From four to five million brick made on each Repress in a year shows their reliability. There is but one Repress and Eagle is its name.

Very Truly,
GALESBURG BRICK & TERRA-COTTA CO.,
Per Albert Warren, Sup't.

IF YOU WANT THE greatest output with the least repairs, you must get our line. Write to-day. Tomorrow never comes.



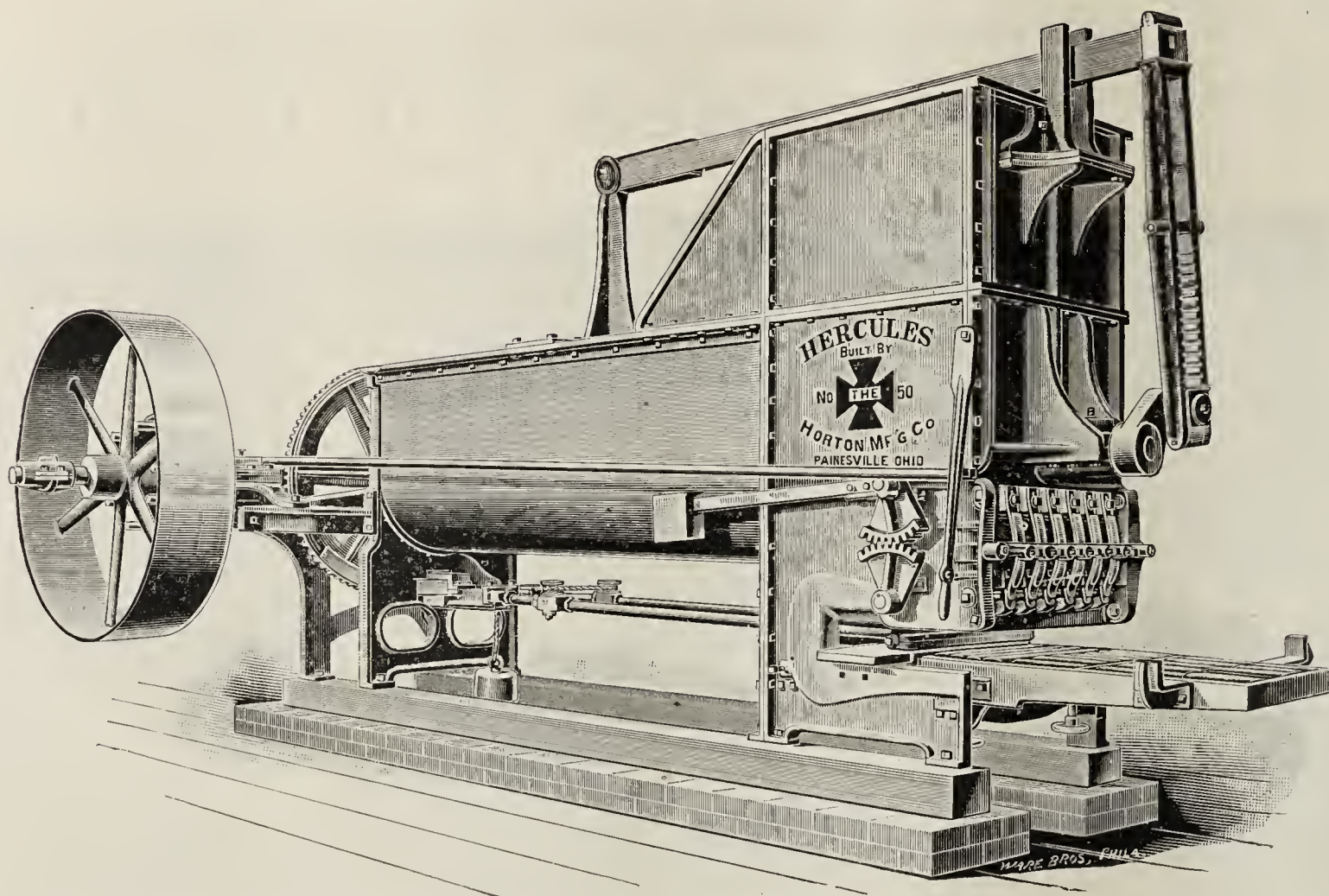
The American Clay-Working Machinery Co.,
Bucyrus, Ohio, U. S. A.



HERCULES.

As its Name Denotes Strength.

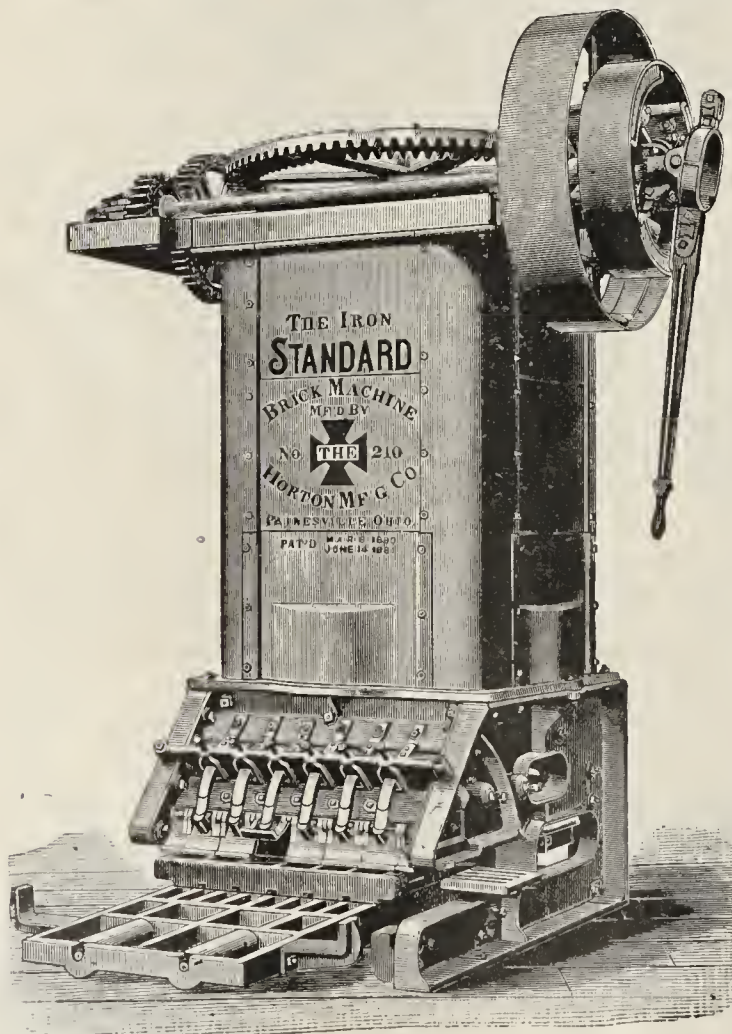
Capacity 40,000 to 50,000
Brick per Day.



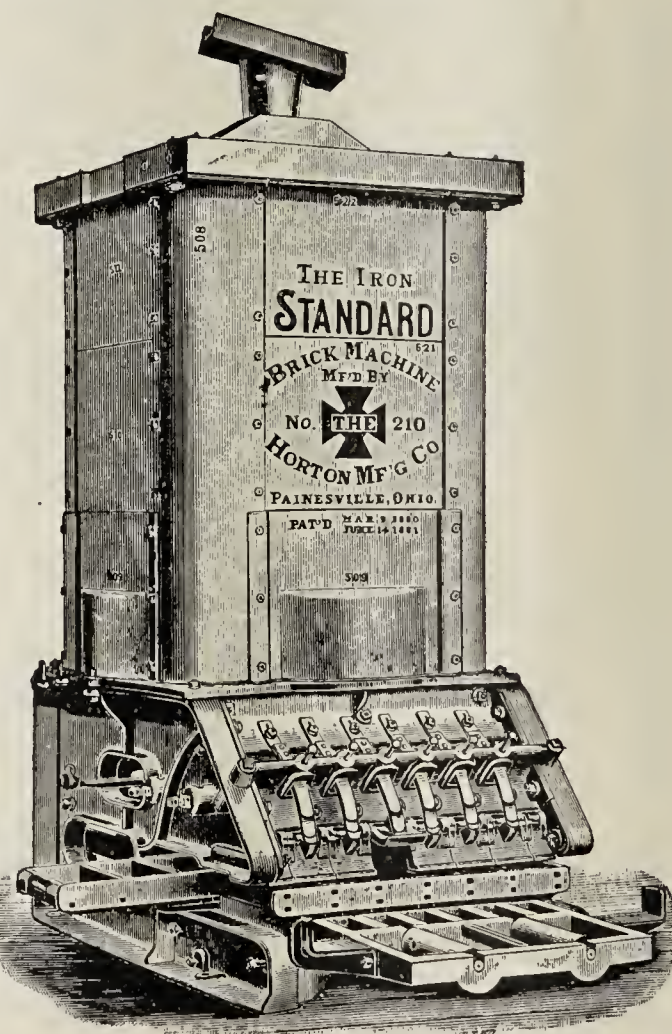
The Acme of Simplicity, Durability and Capacity.

Do not overlook the fact that this is the simplest machine in the field to-day. We can convince you of the superior merits of our machines in very short order; our illustrated '98 Catalogue gives full details. This machine is a new departure from all other Mold Machines. It is no Experiment, it has features that are found in no other machine built to-day. Do not adopt an out of date machine, write to us for catalogue giving full particulars.

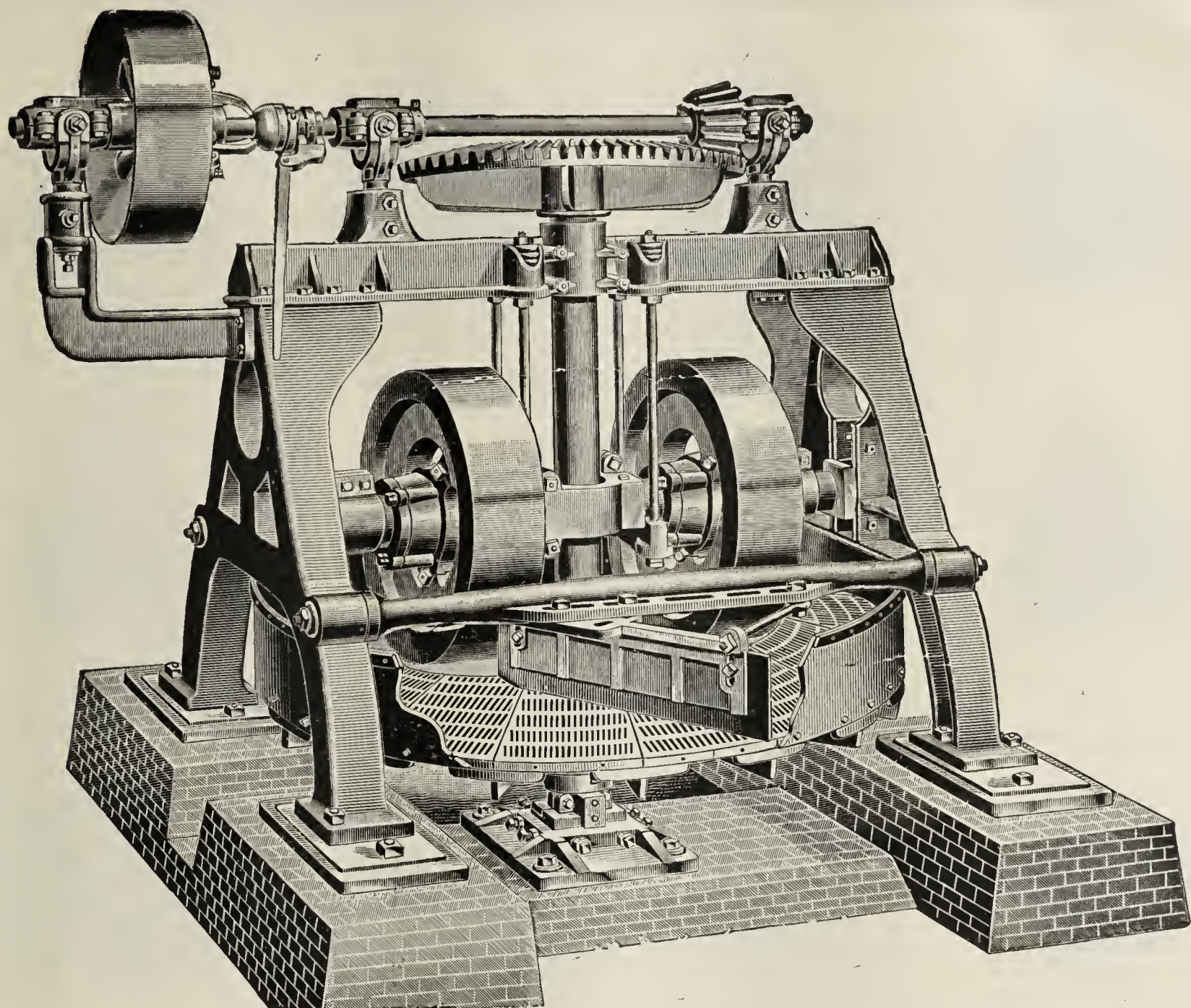
Our Standard Machines.



Mold Sanders,
Disintegrators,
Hoisting Drums,
Pug Mills,
Wheel Barrows,
Dump Carts,
Clay Cars,
Elevators
And the best Mold in
the market.

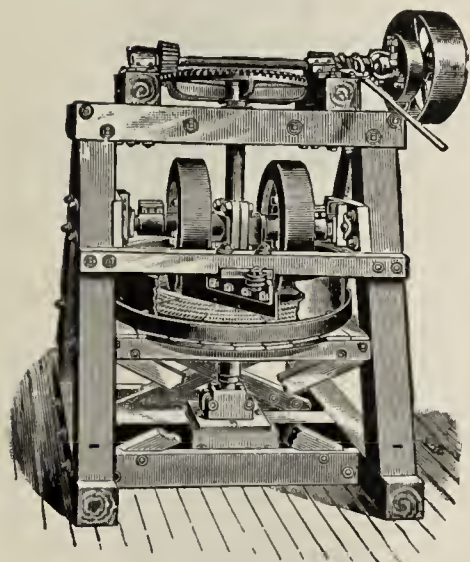


The Horton
Manufacturing
Company,
PAINESVILLE, OHIO.



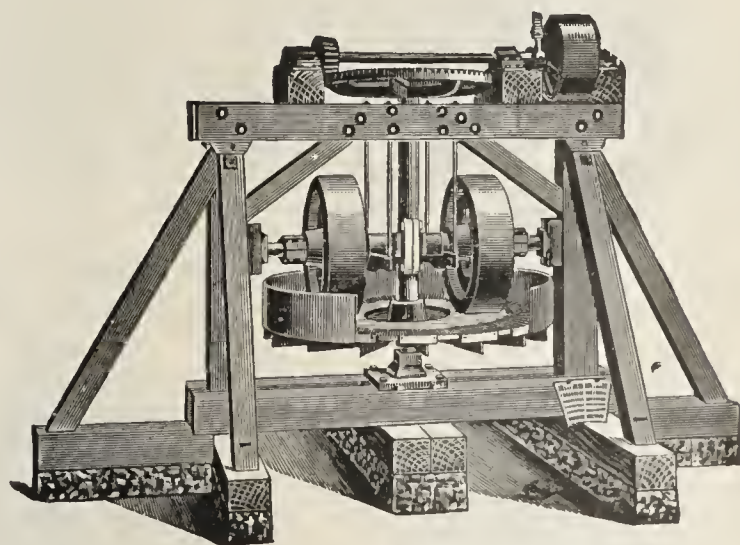
OUR SPECIALTY IS

DRY PANS.



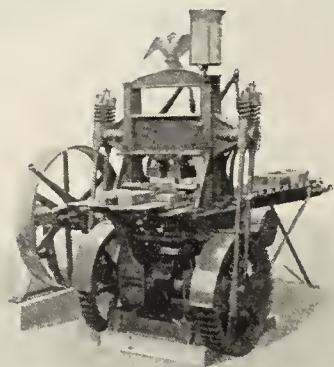
IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~

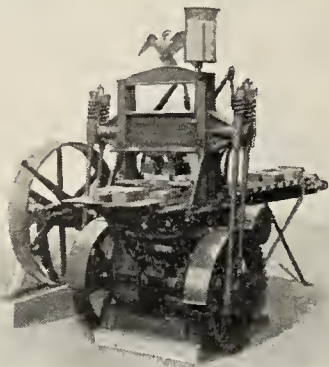
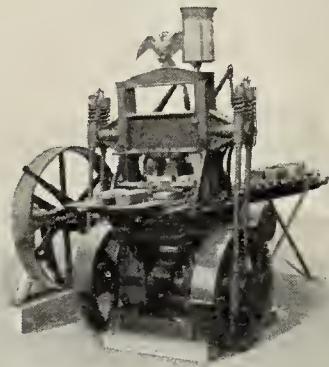
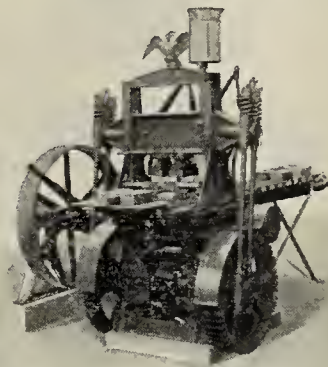
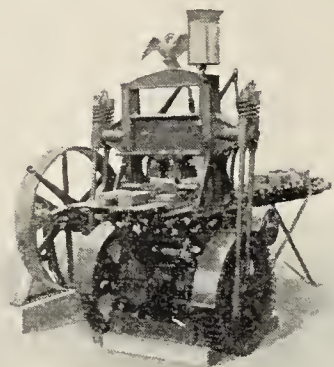


.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.



Winslow & Co., Portland, Maine.

Atchison Paving Brick Co.,
Atchison, Kan.Marion Brick Works No. 1.,
Montezuma, Ind.Marion Brick Works, No. 2.
Montezuma, Ind.Humboldt Brick Mfg. Co.,
Humboldt, Kan.

The Past and Present.

The past has been a seed time and the present a harvest. The seeds of success were sown when we put the Eagle Reprass on the market, because we embodied in it the most correct and advanced ideas in reprass building: It possesses simplicity and durability, backed up with honest construction. These germs grew, they were good seeds and took root upon the clayworkers. Each year the growth of popularity has spread and the Eagle has taken a stronger hold upon the trade, until the present it is recognized as the peer of presses, and the successful brickmaker who is in the market for the best press turns naturally to the Eagle. Thus the present is a harvest of orders reaped from the seeds of merit. It's money in the clayworker's pocket to buy the Eagle because the saving on repairs will pay the cost of the press in a short time to say nothing of the added quality of the brick made.

There are more Eagle Reprasses used to-day than all other makes combined. Not only are they giving the best of satisfaction but any user will give a flattering report of the Eagle.

If you want the best reprass, Write us.

If you want to save money on repairs. Write us.

If you want to know what others think of the Eagle.

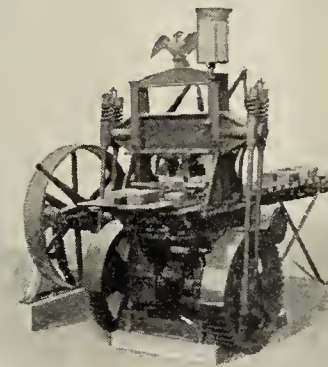
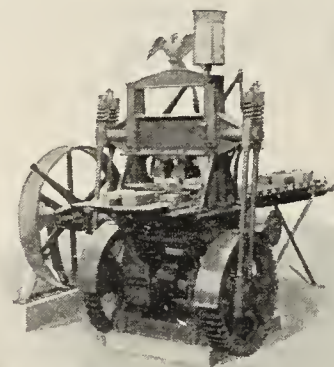
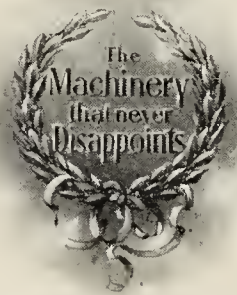
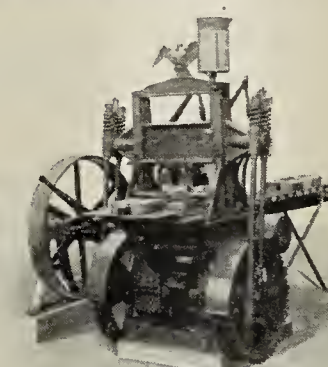
Write us.

If you want to talk it over. Write us.

Write to-day, to-morrow never comes.

This page contains photos of the Eagles put in during the past sixty days, with names of buyers. These represent some of the most advanced and successful Clayworkers of the country: The men who are in business to make money and not to pay repair bills. If you want the best machinery come to us and we'll sell you some of "The Machinery that Never Disappoints." We make a full line of it, all as good as the Eagle Reprass, and it is the best there is. We have in Galesburg, Ill., alone, 13 Eagles. We have in Des Moines, Iowa, alone, 6 Eagles. This is our record in two of the leading brick centers of the country.

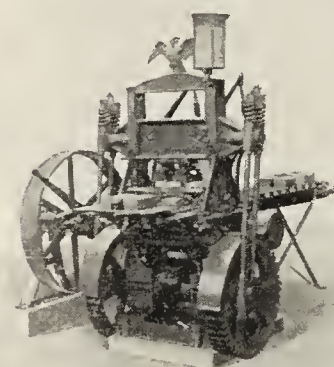
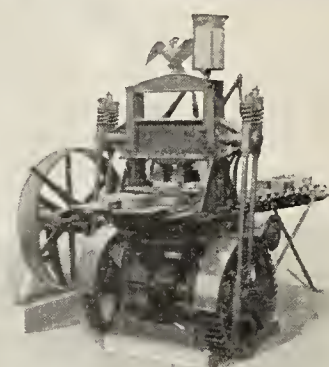
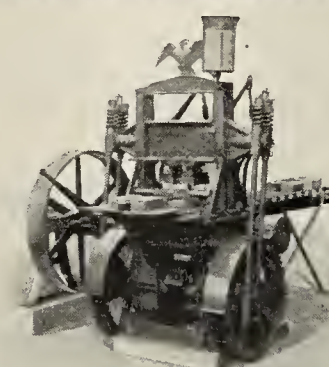
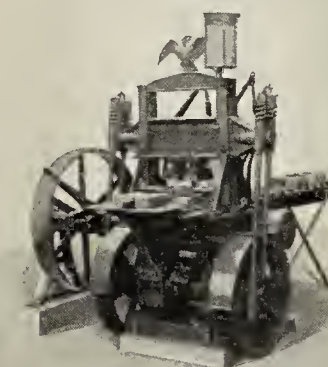
P. S. Take notice we give names of purchasers.

Marion Brick Works, No. 3.
Montezuma, Ind.Washington Brick, Lime & Mfg. Co.,
Spokane, Wash.

The Turner Brick Chicago, Ill.

The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

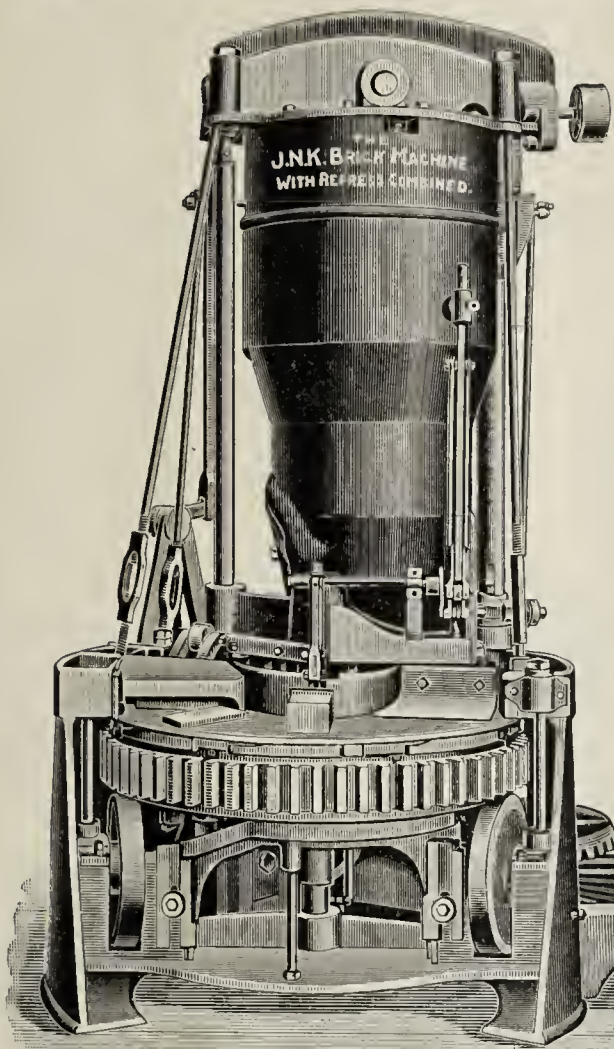
The Flint Brick Co., No. 1.
Des Moines, Iowa.The Flint Brick Co., No. 2,
Des Moines, Ia.Moberly Brick Tiling & Earthenware
Co., Moberly, Mo.Capital City Brick & Sewer Pipe
Co., Des Moines, Iowa.

A GREAT IMPROVEMENT IN STIFF MUD BRICK MACHINES.....

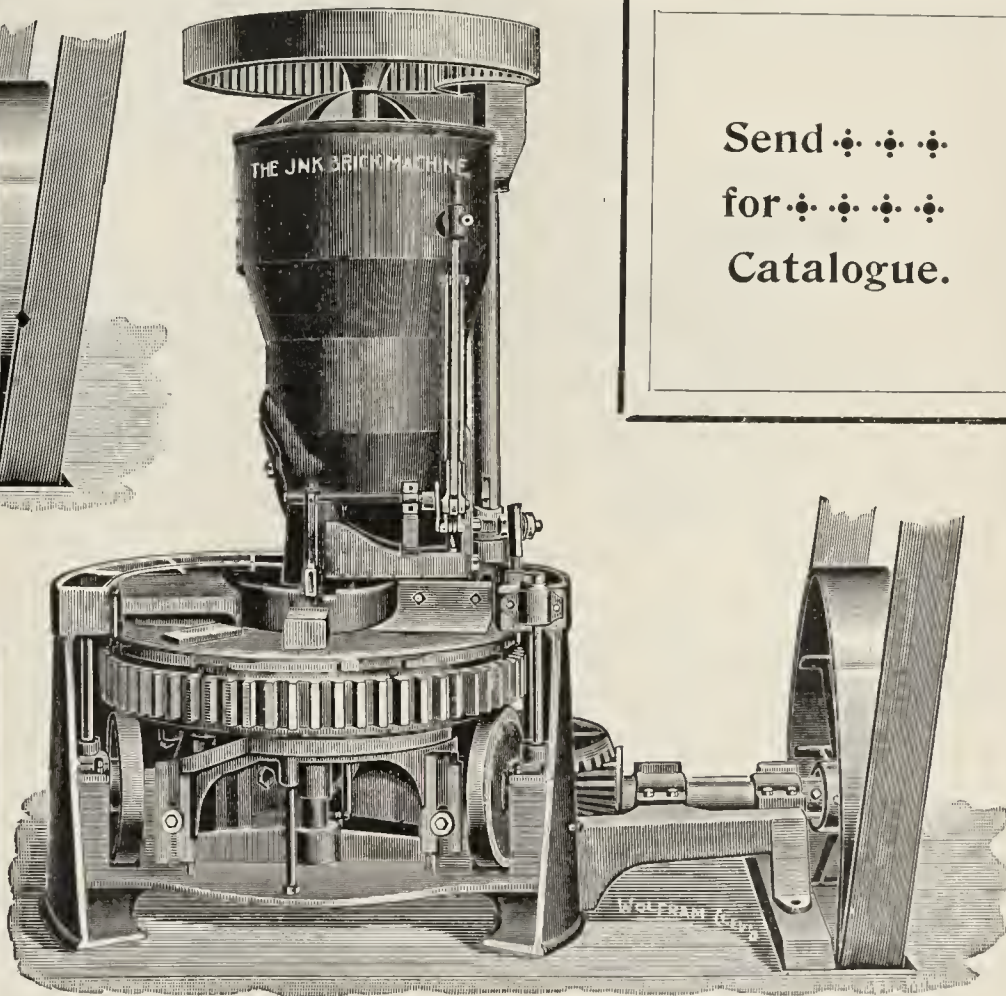
The J. N. K. Brick Machine

With Repress Combined.

THIS MACHINE has eight molds in the mold wheel, and the wheel revolves and brings the mold under the clay cylinder, where the molds are filled, then pressed to an even thickness, then comes the repress and represses them, next the brick is pushed out of the molds and onto a belt, then the mold is wiped and oiled and passes on under the clay cylinder again; now you have followed one mold around, and have made eight brick, now you can see as one brick is being made, one is pressed and one is repressed, one pushed out and one pushed off, and one mold wiped and oiled, and the repress is wiped and oiled every time it makes a brick, by these combined movements there is no time lost as 45 brick are made in one minute, and repressed and pushed off, and the molds wiped and oiled in the same minute, as all these movements act at the same time. With this machine fine re-pressed brick can be made as cheap as common brick.



The J. N. K. BRICK MACHINE with
Repress Combined.



The J. N. K. BRICK MACHINE without Repress.

Send ♦ ♦ ♦
for ♦ ♦ ♦ ♦
Catalogue.

The J. N. K. Brick Machine

Without the Repress will make 60 brick per minute, square, even in thickness, smooth top and bottom, sharp corners and edges, parallel in thickness, a good nice-looking brick, the mold is wiped out and oiled, and the brick are made the same as the brick on the repress machine, and the movements are the same, except the repress taken out, and it can readily be seen what I mean by a great improvement in stiff mud brick machines. As I manufactured the P. L. Sword Machine for about 10 years and having heard of all complaints, and objections to it I started out four years ago, when I bought them out, and began to remove all these though it has taken me four years of hard work and thousands of dollars to accomplish it, the results are the J. N. K. Brick Machine has none of these objections, which were made against the P. L. Sword machine; namely, the press plate and cut-off knives are not used on the J. N. K., as the brick are finished under the cylinder. The molds, when first filled, are filled one half-inch fuller than you want the brick; this surplus half-inch of clay is pressed back, under a heavy pressure into the cylinder, and the pressure is kept on till the brick is finished, so there cannot be any shifting of the clay to one side. The J. N. K. has a thorough system of wiping and oiling the molds. I will further say to those that are using the Sword Machine and are in need of a new mold wheel, or any other repairs, I respectfully request a continuance or the liberal consideration, which was at all times shown to me, by those who purchased from me. Any one wishing further information on the J. N. K. Brick Machine or desiring a P. L. Sword Machine or any part thereof, address

Central Machine Works,

JOHN N. KAUFHOLZ, Proprietor,

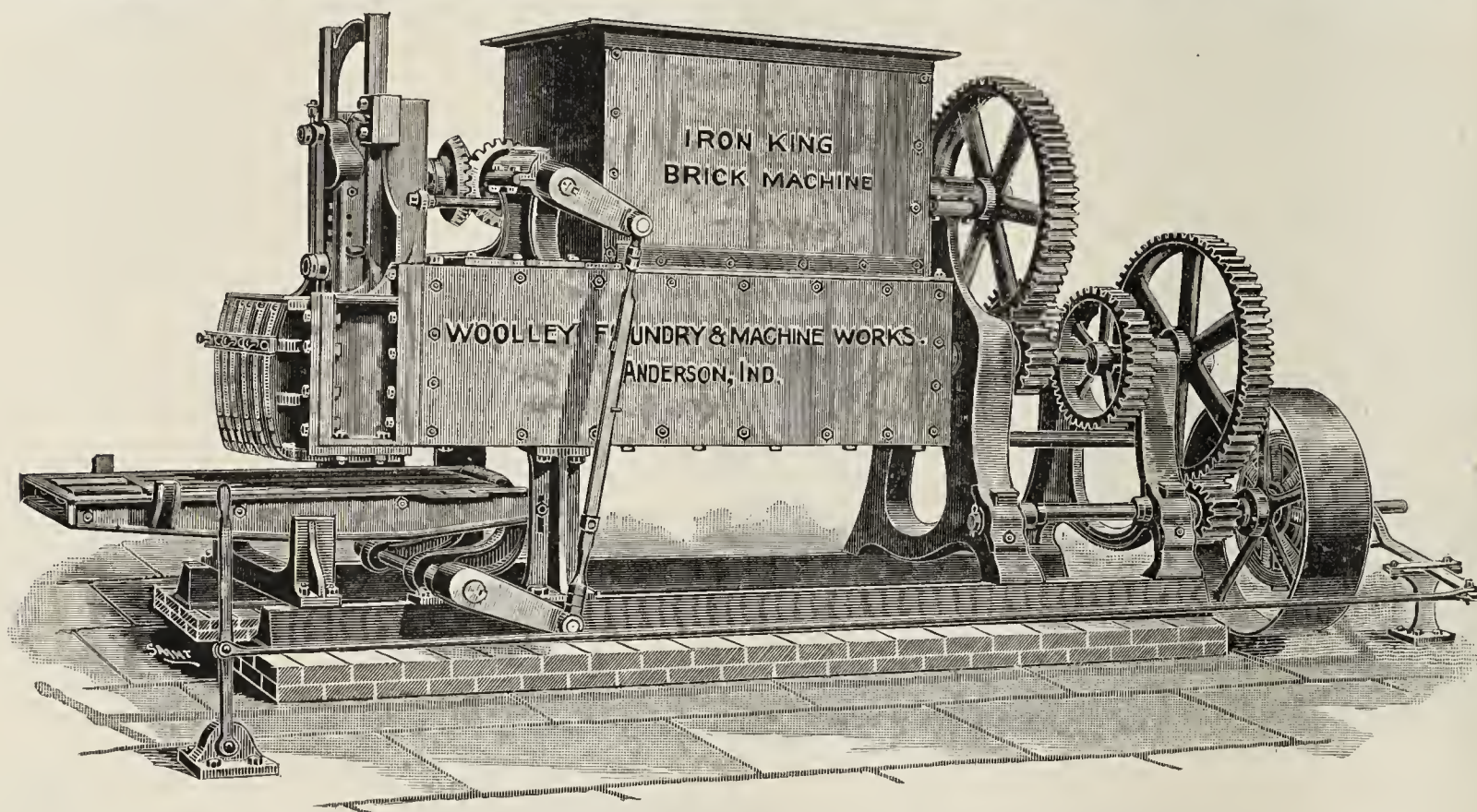
OFFICE AND WORKS:
226-236 Abbey Street.

CLEVELAND, OHIO.

SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “IRON KING” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

WOOLLEY DRY PANS,
PUG MILLS,
SLIP PUMPS
and PRESSES

Are all made for hard service If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

Mention the Clay-Worker.



From Maine to California.

YORK CORNER, ME., October 25, 1897.

THOS. GOSS,
President.

A. A. HUBBARD,
Sec'y and Treas.

C. & A. POTTS & Co.:

Gentlemen—It give me pleasure to say the two Brick Machines, two mould sanders and two disintegrators I bought of you six years ago are all doing excellent work.

The two No. 4 Disintegrators I can not speak too highly of. They separate the stones, thoroughly disintegrate the clay, and do their work in every way satisfactorily.

The two brick machines make 45 M per day each. The bricks are perfect, as good as can be struck with mud. They are smooth, sharp corners, and struck stiff enough to retain size, while trucking off on pallets or put in racks.

The two Mould Sanders do their work all right—I hear no complaint.

Wishing you success that you merit,

Very truly yours,

J. P. NORTON,
York Corner, Maine.

CITY BRICK COMPANY,

Office, 125 West Second Street.

Telephone Main 788.

LOS ANGELES, CAL., December 20th, 1897.

Messrs. C. & A. POTTS & Co., Indianapolis:

GENTS—It is a pleasure for us to give testimony as to the good qualities of your Iron Horizontal Stock Brick Machine, which we have had in use for the past two seasons.

It gives us entire satisfaction. We have not paid out one dollar for repairs, and the quality of bricks turned out can not be excelled. Our output is 36,500 bricks per day of eight hours.

We will add to this, that, should we need another machine, our first choice would be an ALL IRON POTTS HORIZONTAL.

Yours truly,

CITY BRICK CO.

A. A. Hubbard, Sec'y.

“In every action reflect upon the end; and in your undertaking it, consider why you do it.”—Jeremy Taylor.

And from every State in the Union we have any number of just such letters as the above.



Hundreds of them are in use and every one giving entire satisfaction. We manufacture everything needed on the Brickyard. Now is the time to purchase your supplies for the coming season.

Brick Machines, Disintegrators, Mould Sanders, Granulators, Elevators, Cars, Winding Drums, Moulds, Trucks, Barrows and all Brickyard supplies.

Our prices are low and terms liberal.

C. & A. POTTS & CO.,

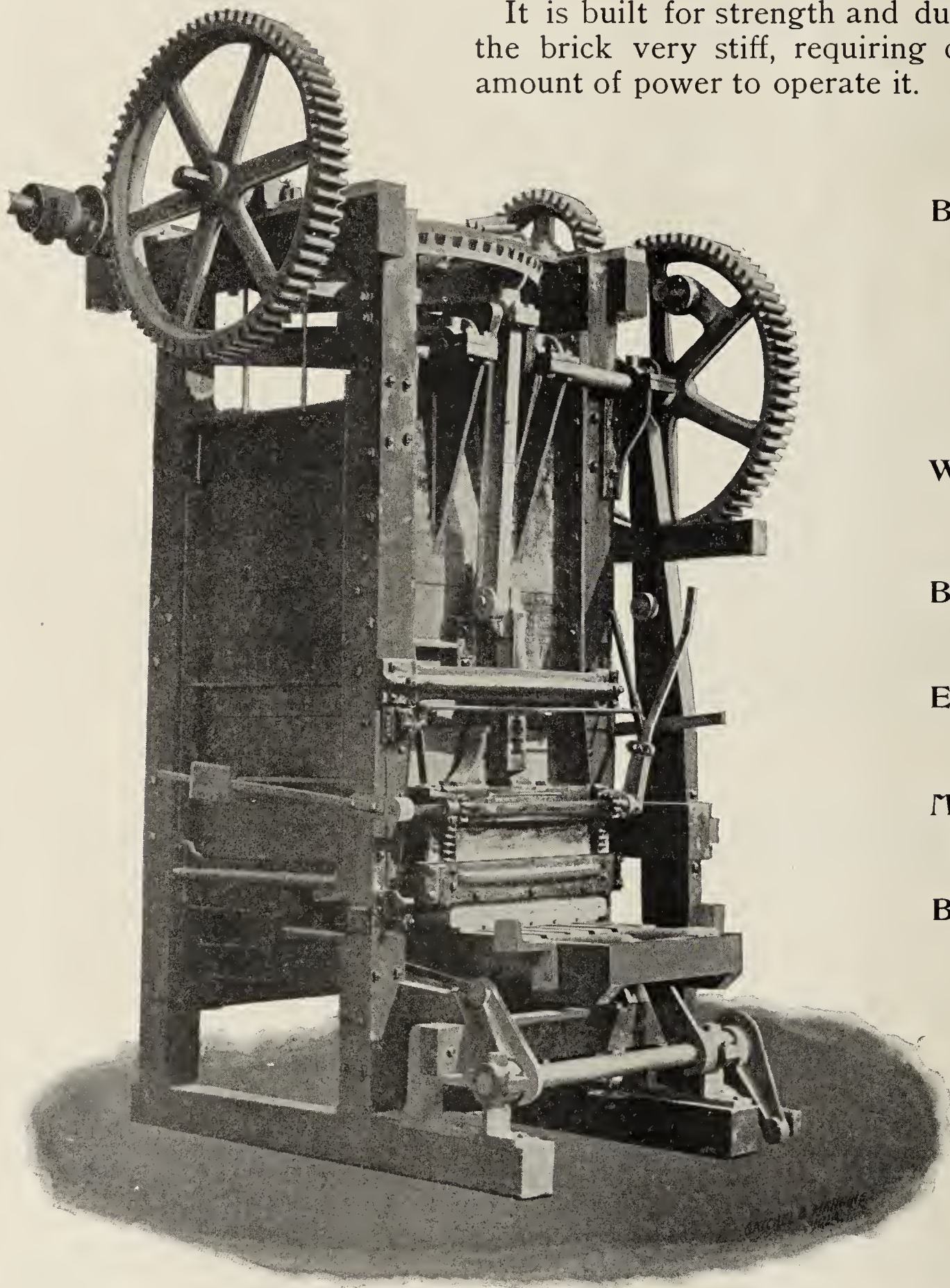
816-828 West Washington St.,

INDIANAPOLIS, IND.

The Favorite Stock Brick Machine.

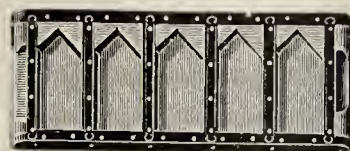
Weight 10,500 Pounds.

It is built for strength and durability, and to mould the brick very stiff, requiring comparatively a small amount of power to operate it.



• • •

BRICK MOULDS



....a Specialty.

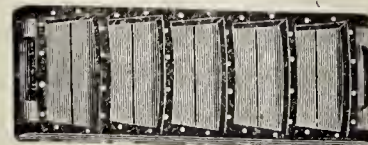
• • •

We furnish everything
a Brickmaker needs.

• • •

Brick Machines,
Pug Mills,
Clay Crushers,
Elevators,
Sand Grinders,
Mould Sanders, etc.
Machine Moulds,
Hands Moulds,
Wheel Barrows,
Brick Trucks,
Sand Dryers,
Dump Cars,
Dryer Cars,
Kiln Castings, etc.

• • •



ALL SIZES. ALL SHAPES.

Send for our 1898 Catalogue and mention anything you need.

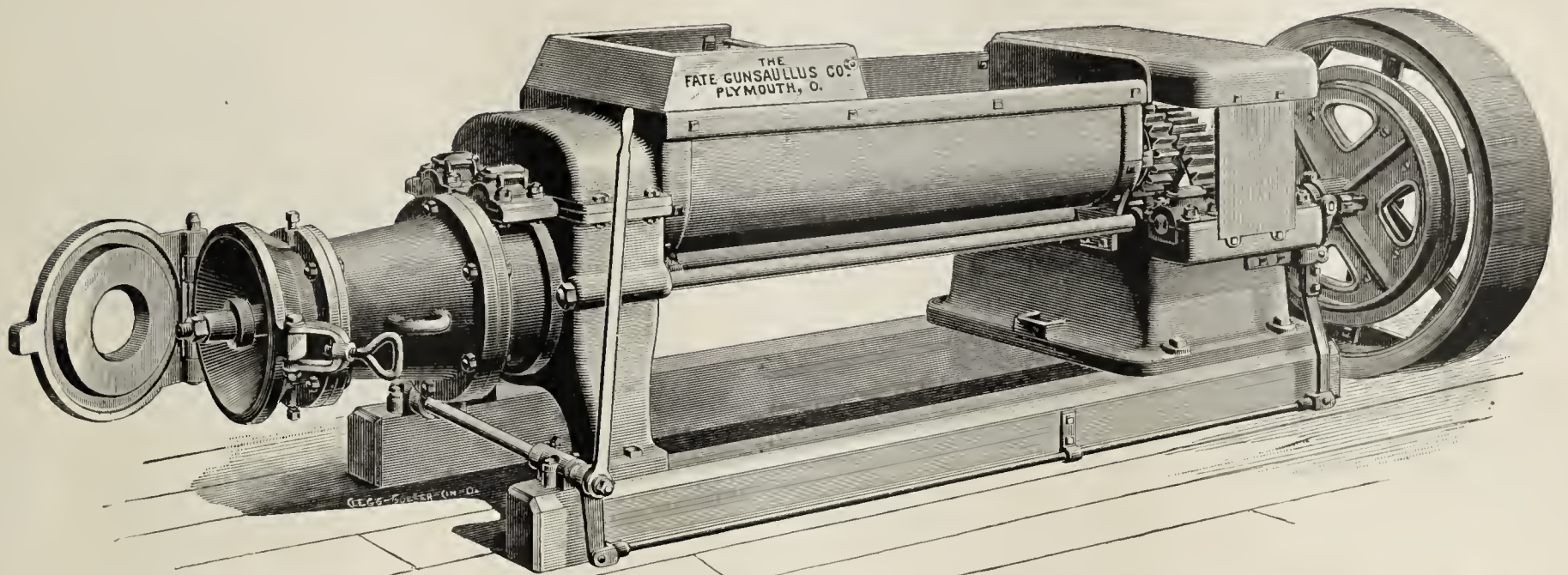
The Henry Martin Brick Machine Mfg. Co.,

OFFICE AND WORKS: 552 No. Charlotte St.

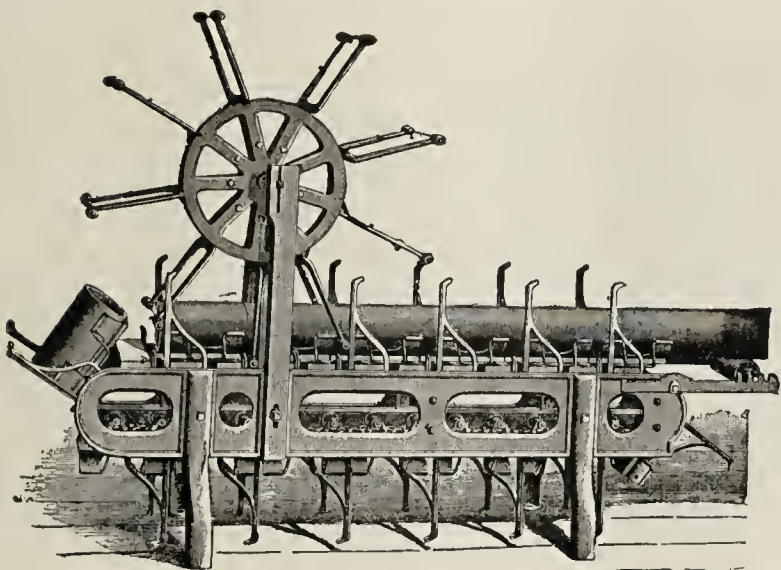
LANCASTER, PENN.

Postal Telegraph-Cable Co. Direct Wires to Factory Office.

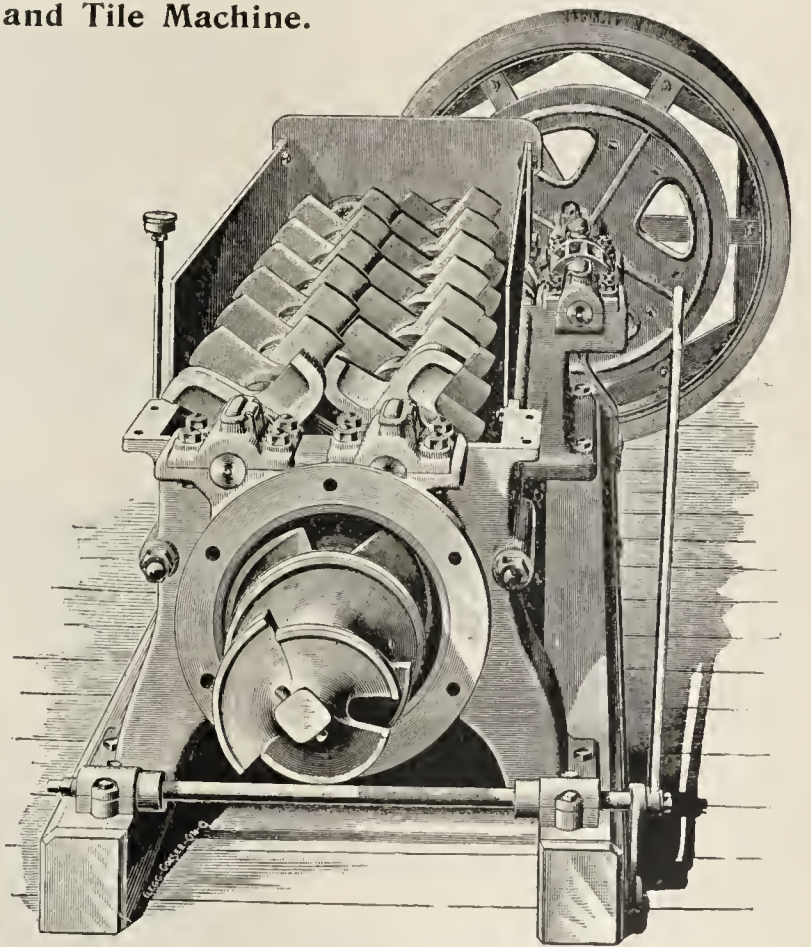
The "PLYMOUTH."



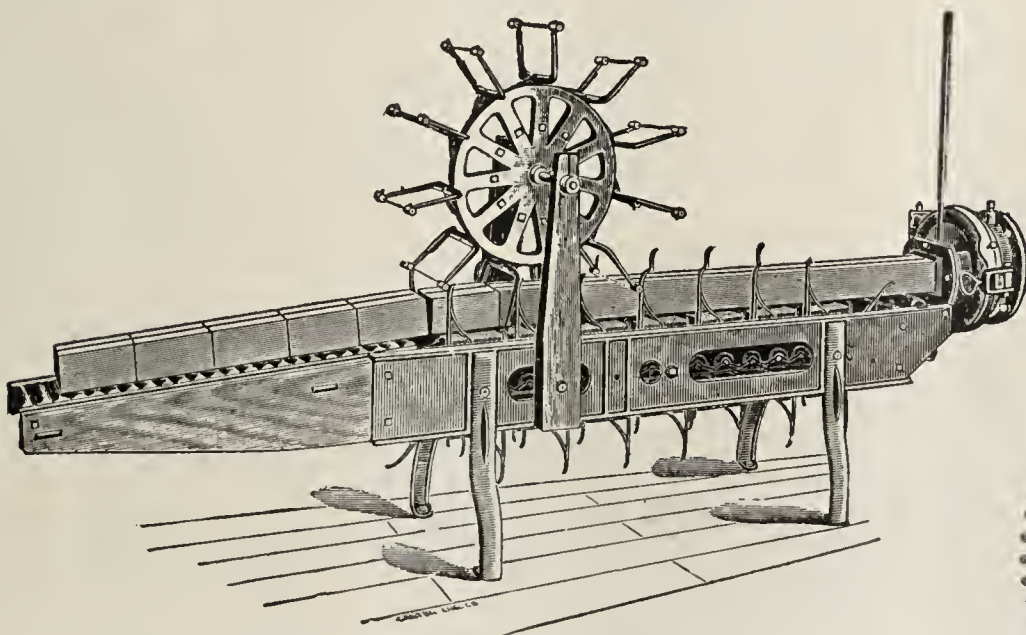
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



"HUMMER" (Interior View.)

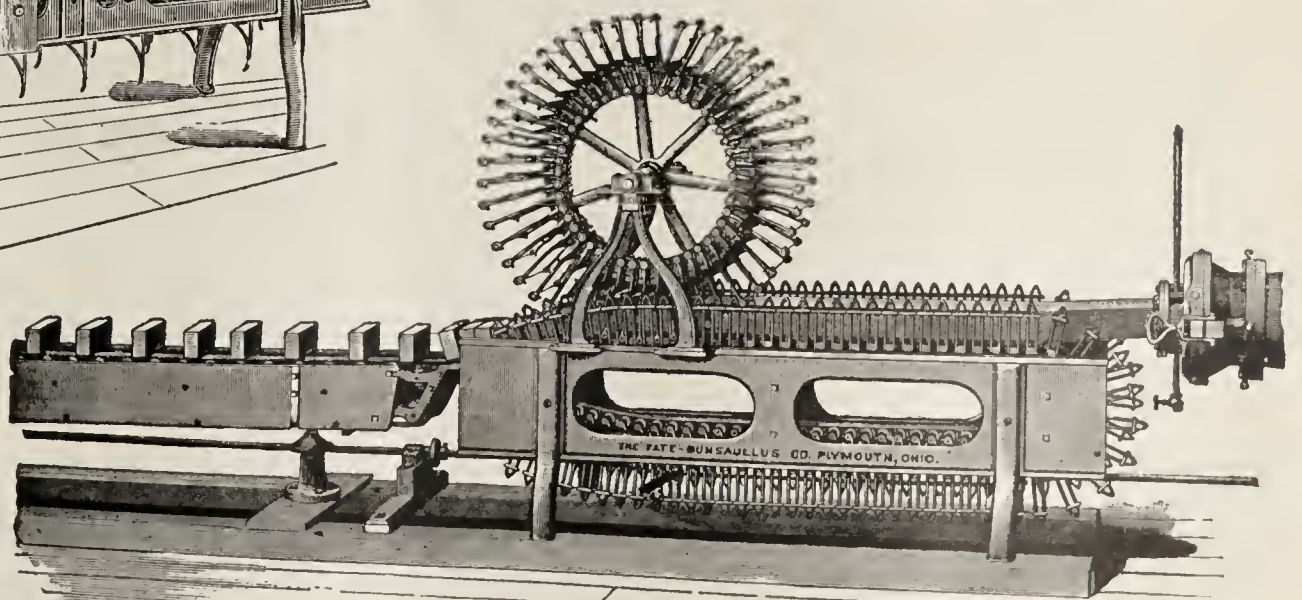


Automatic End-Cut Brick Table.

Write for particulars to

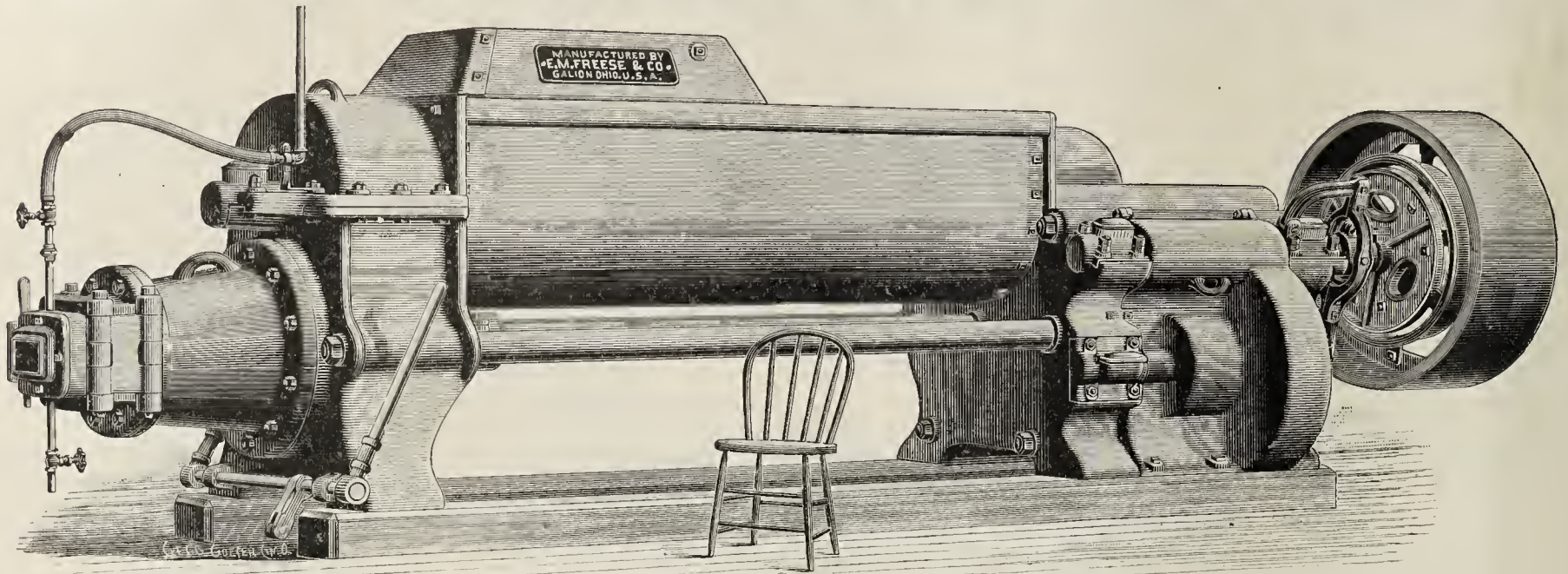
**The Fate-
Gunsaulus Co.,**

**PLYMOUTH,
Richland County, OHIO.**



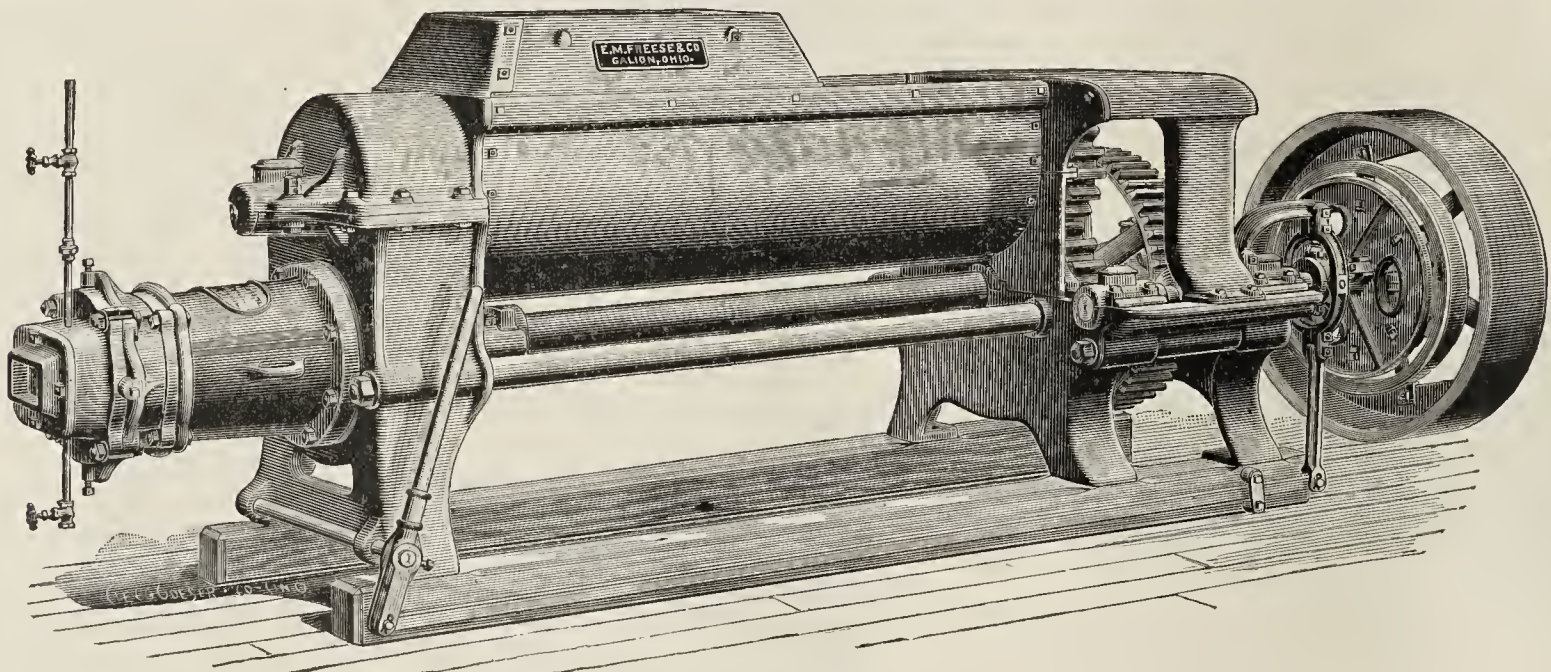
Automatic Side-Cut Brick Table.

The Original Union Brick Machines



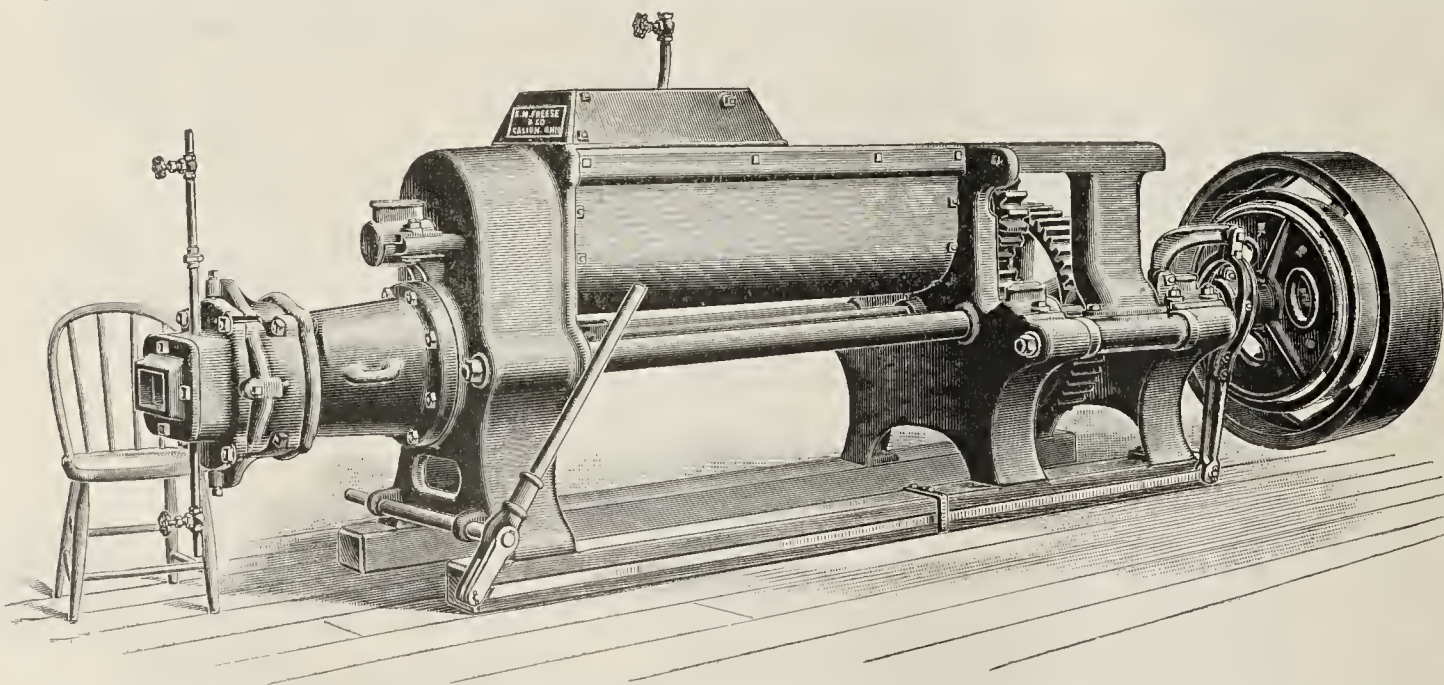
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

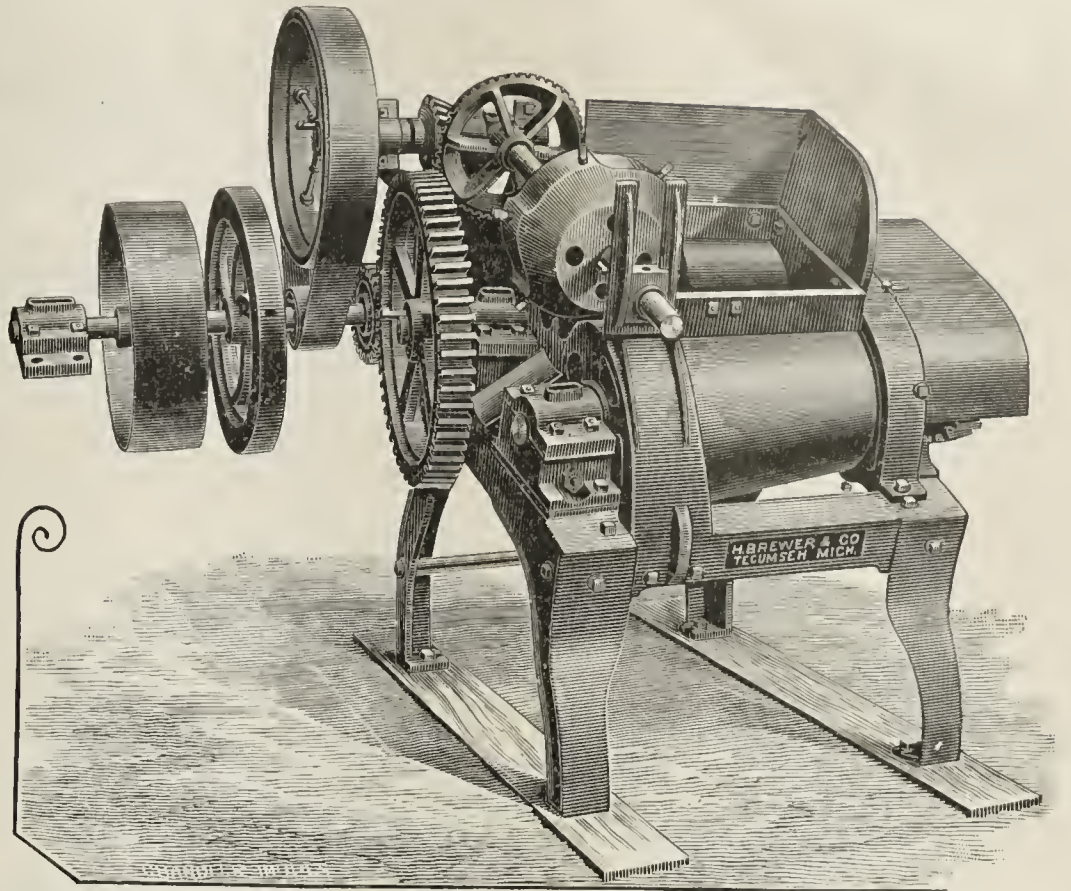
These Machines are
NOT an experiment.

They are used in fif-
teen States.

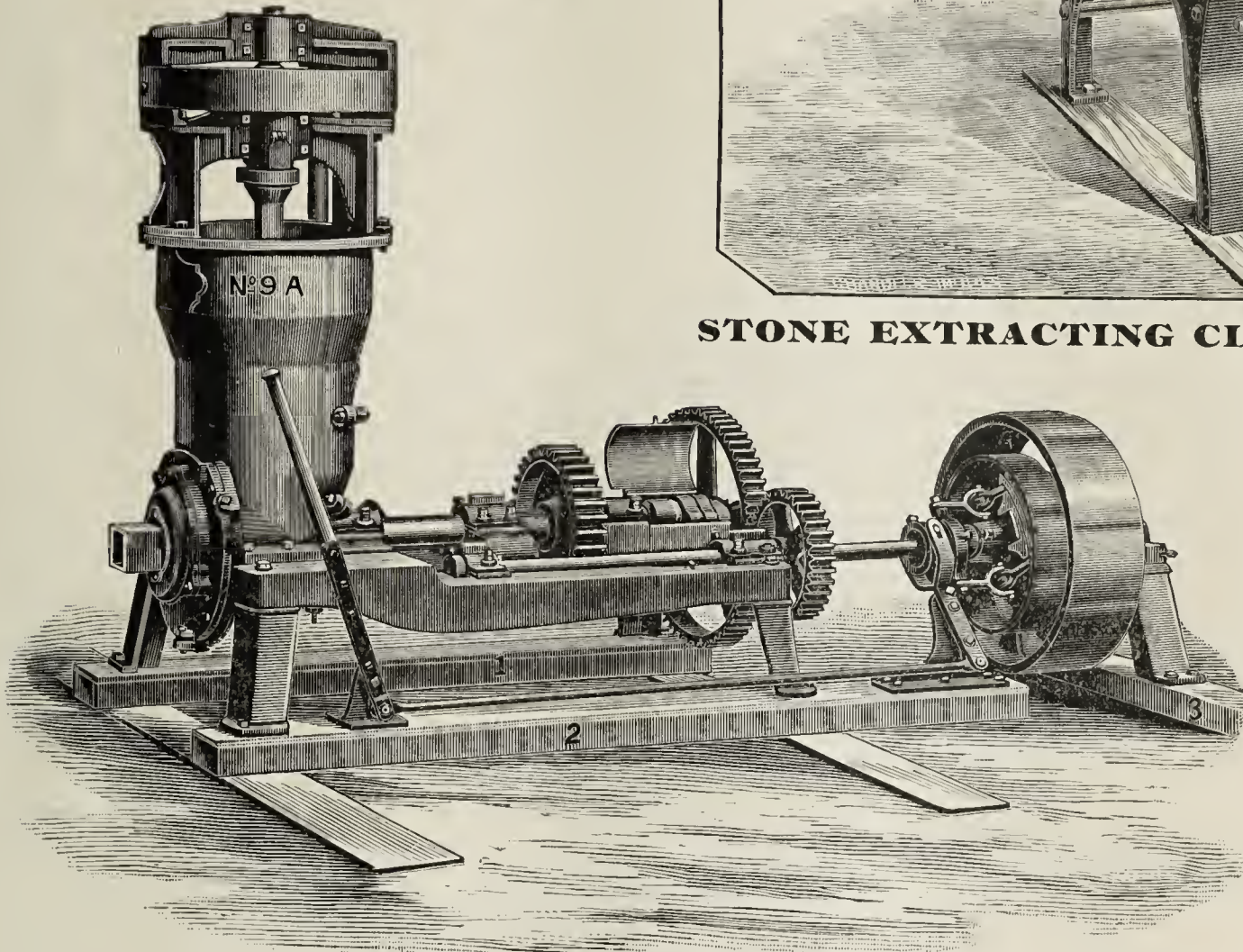
They are a SUCCESS
Investigate them.

No separate Pug Mill
required.

Clay Working Machinery



STONE EXTRACTING CLAY CRUSHER.



No. 9 "A" BRICK MACHINE.

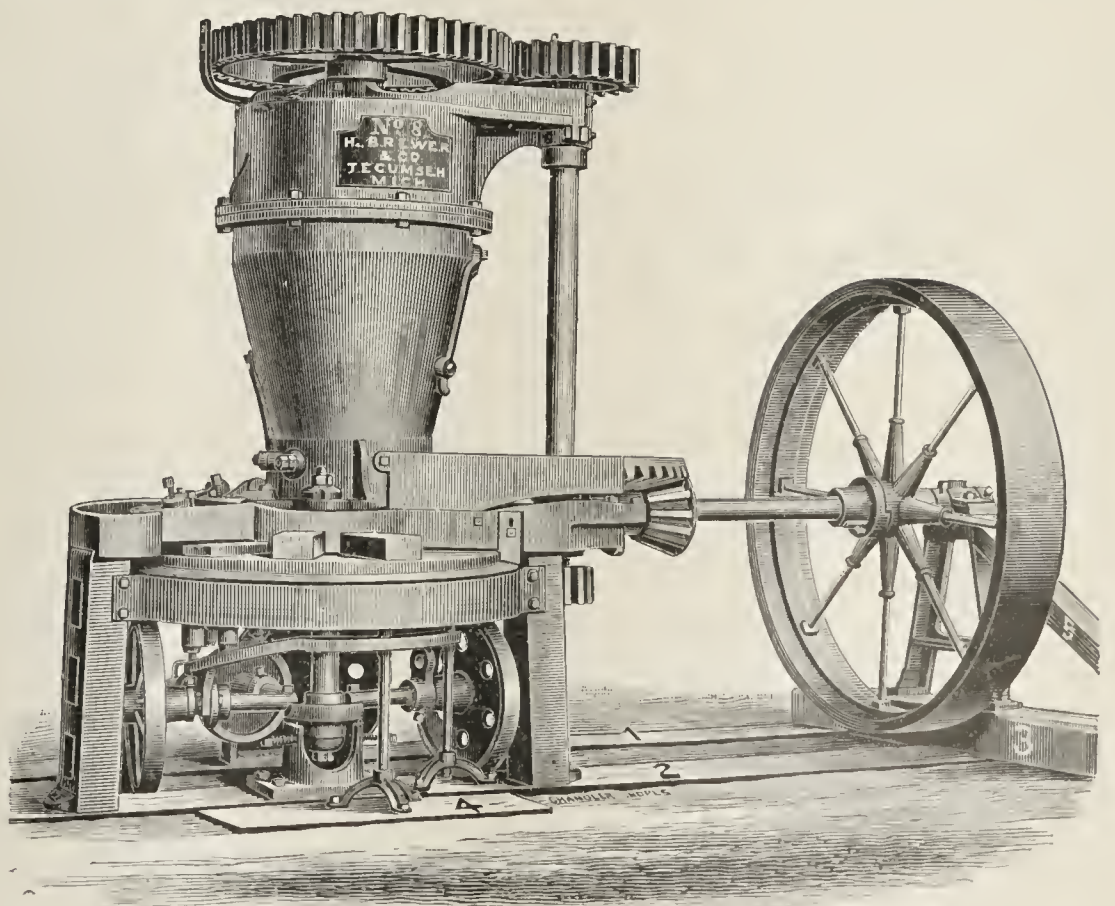
Complete
Brick
and
Tile
Outfits
a Specialty.



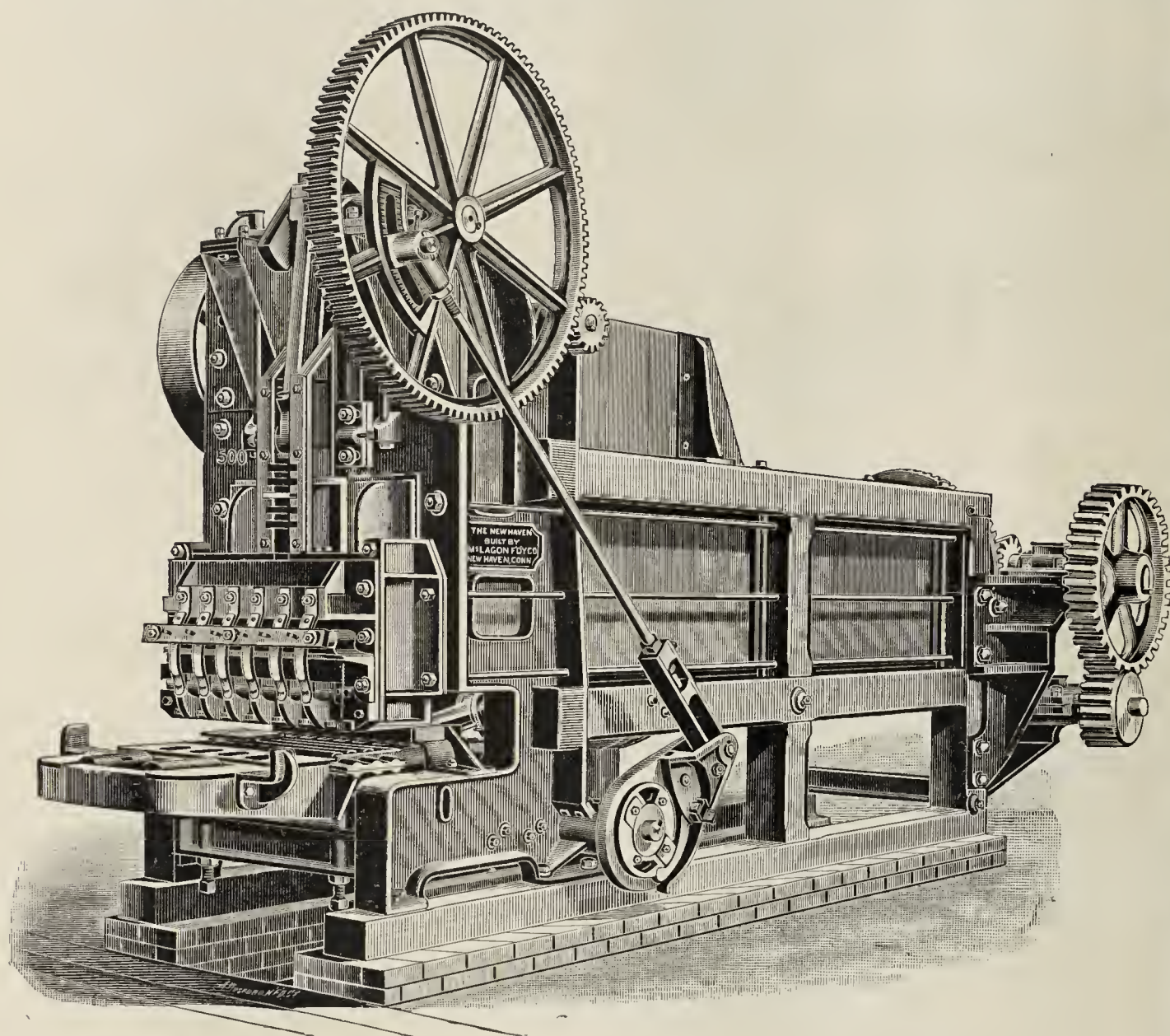
Manufactured by

**H. Brewer
& Co.,**

**TECUMSEH,
. . . . MICH.**



SIXTH SEASON.



No Expense
Whatever
for Repairs.



No Loss
of Time.



Made Better
Brick Than
Before.

SAG HARBOR, N. Y., Nov. 10, 1897.

THE EASTERN MACHINERY CO., New Haven, Conn.:

Gentlemen:—We ran the "New Haven" Brick Machine the past season without any expense whatever for repairs, and without loss of any time, and made better brick than we ever made before; this being the Sixth Season we have used it.

Truly yours,

SAG HARBOR BRICK CO.

C. W. PAYNE, Treasurer.

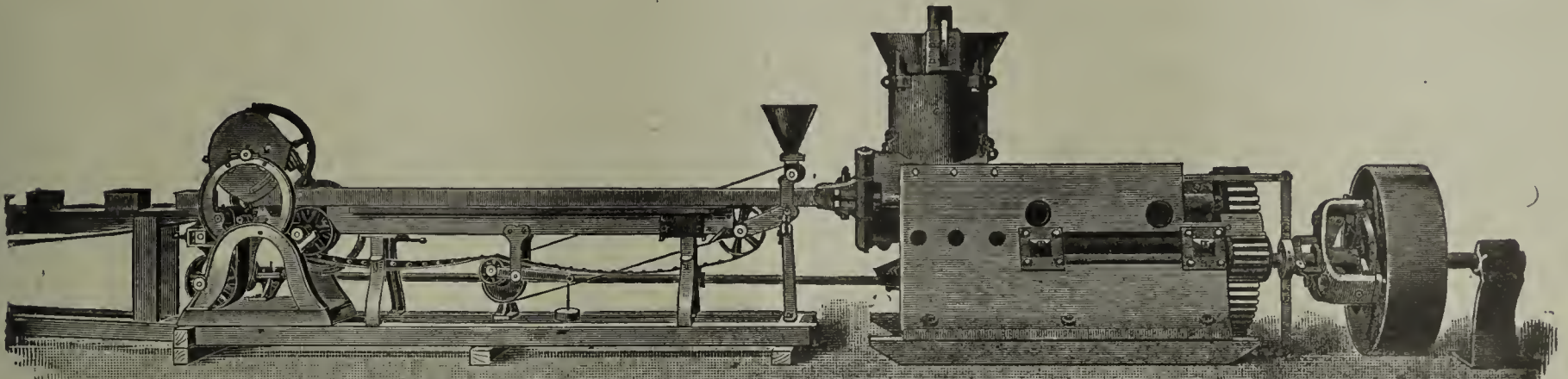
We think this a Good Record.

Write for "Reports from Reliable People."

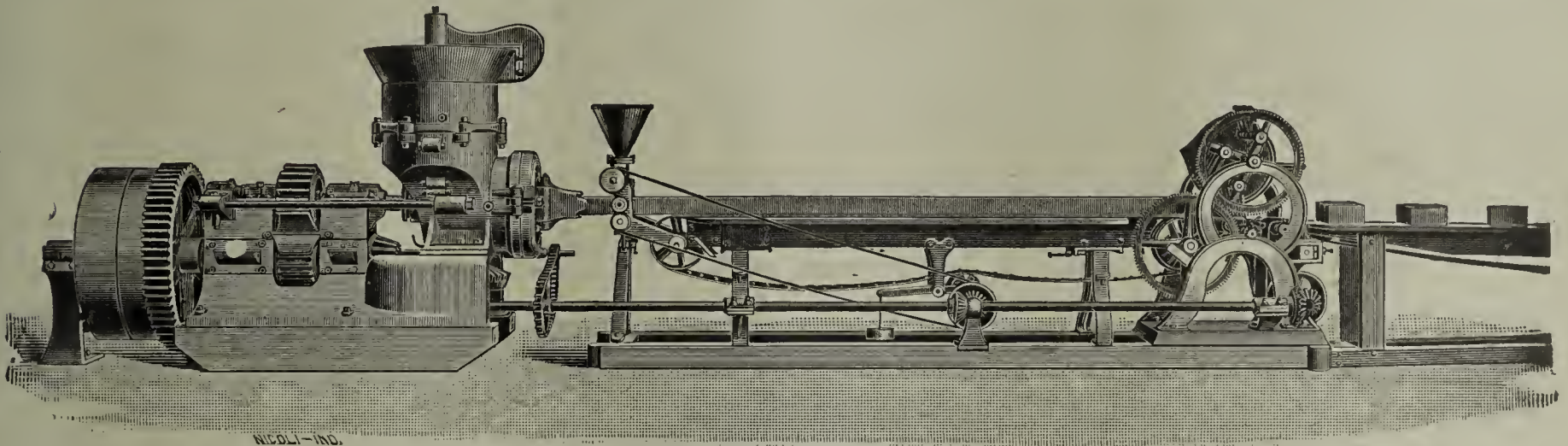
The Eastern Machinery Co.,

NEW HAVEN, CONN.

WONDER MACHINERY.



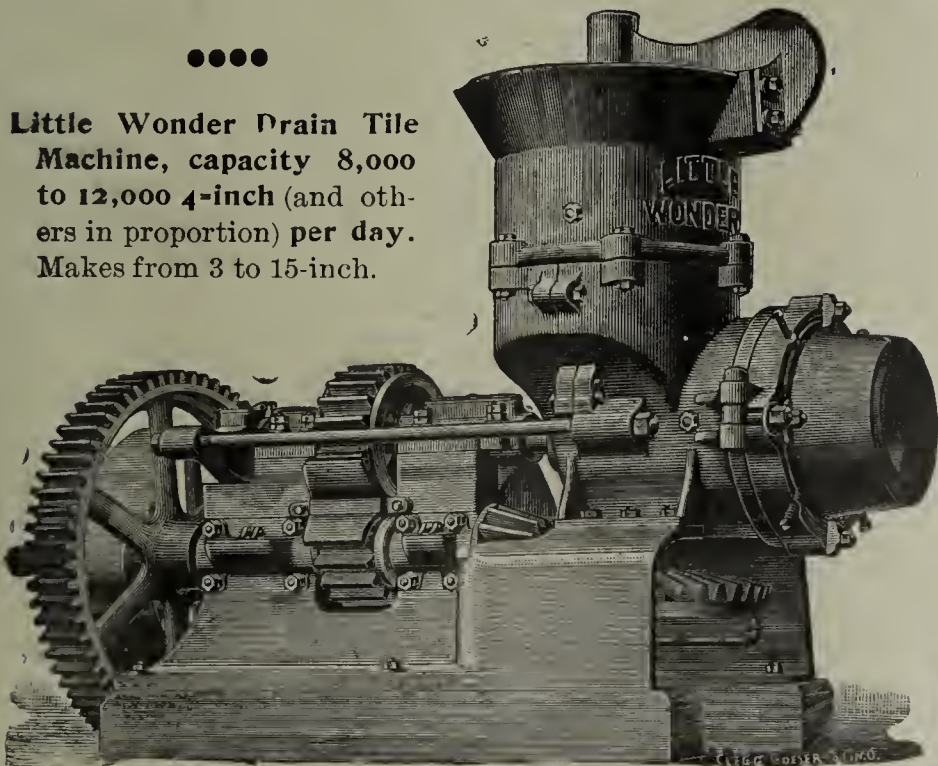
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



MANUFACTURED BY ~

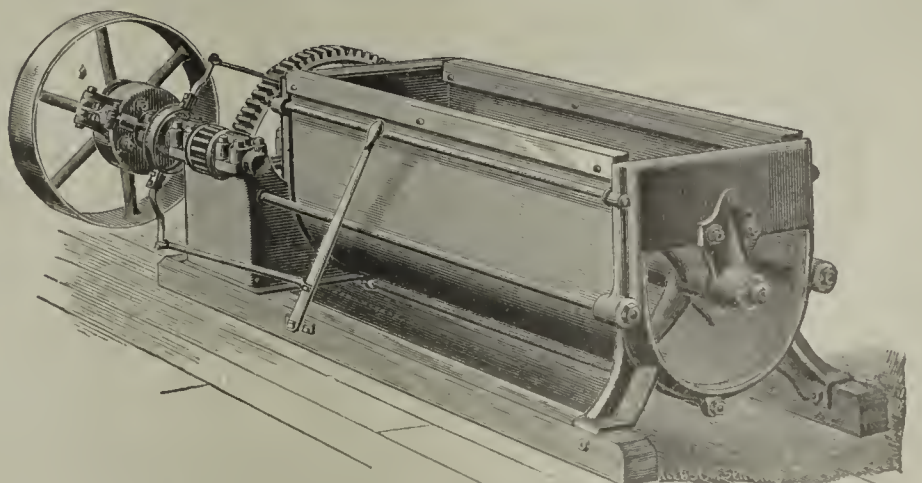
The Wallace Mfg. Co.,
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

Catalogue Free.

THE WONDER BRICK MACHINES
have a Great Puging Capacity, therefore, less lamination in the brick. Guaranteed to run with less power and require less repairs, hence, they are "MONEY SAVERS" and MONEY MAKERS."



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity

Iron Clad Dryer.....IN THE LEAD

All Dry Houses Built in 1898
will be equipped with Important new inventions for reducing cost of drying.

...

**Steam
Heat,
Natural
Draft.**



Guaranteed To dry soft mud, stiff mud, dry pressed brick and tile, free from white-wash, disintegration or other injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,
Harrison 296.

CHICAGO, ILL.



DETROIT, MICH.

**The
Best Brick
Dryer
On Earth**

NOTE -

• WE DRY ENOUGH BRICKS ANNUALLY -
• TO BUILD A WALL TEN COURSES -
• HIGH FROM SAN FRANCISCO TO -
• NEW YORK -



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX, No. 4.

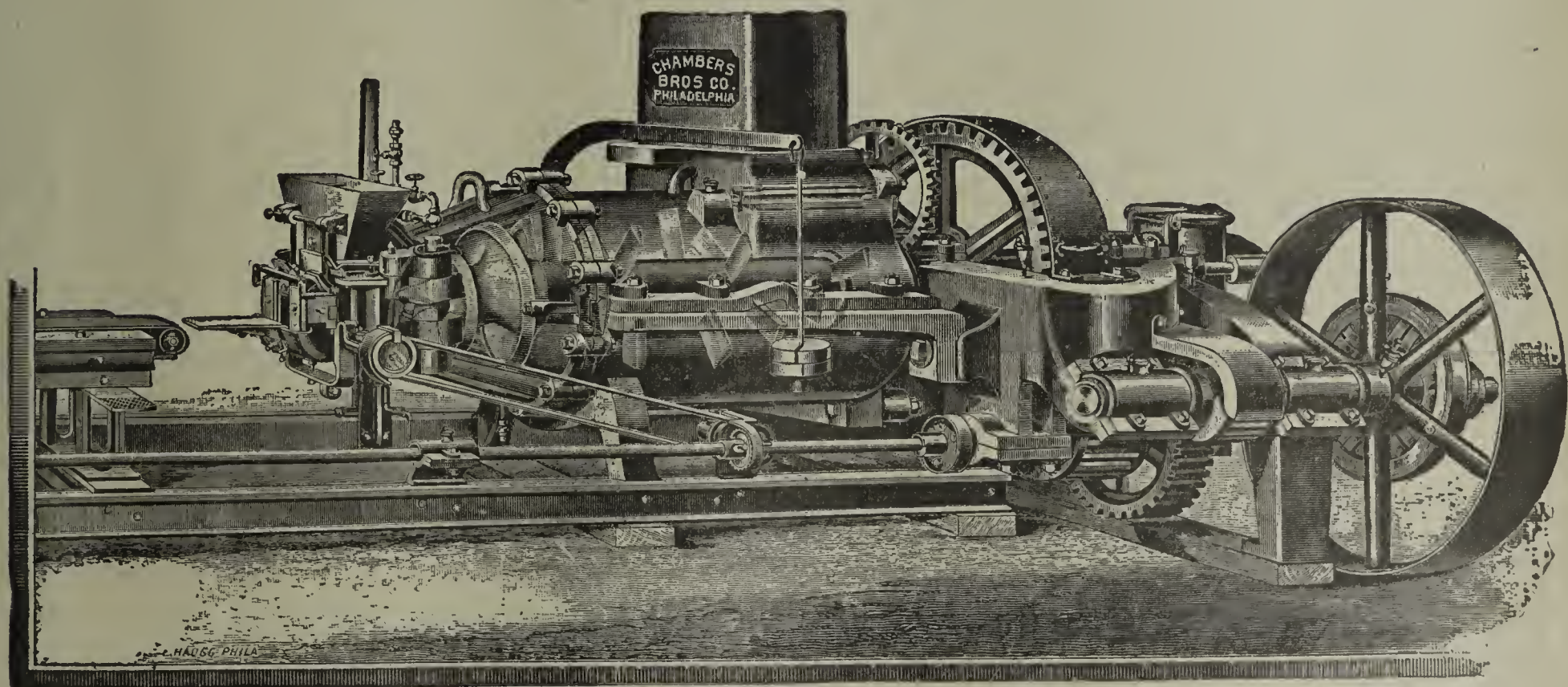
INDIANAPOLIS, IND., APRIL, 1898.

\$2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

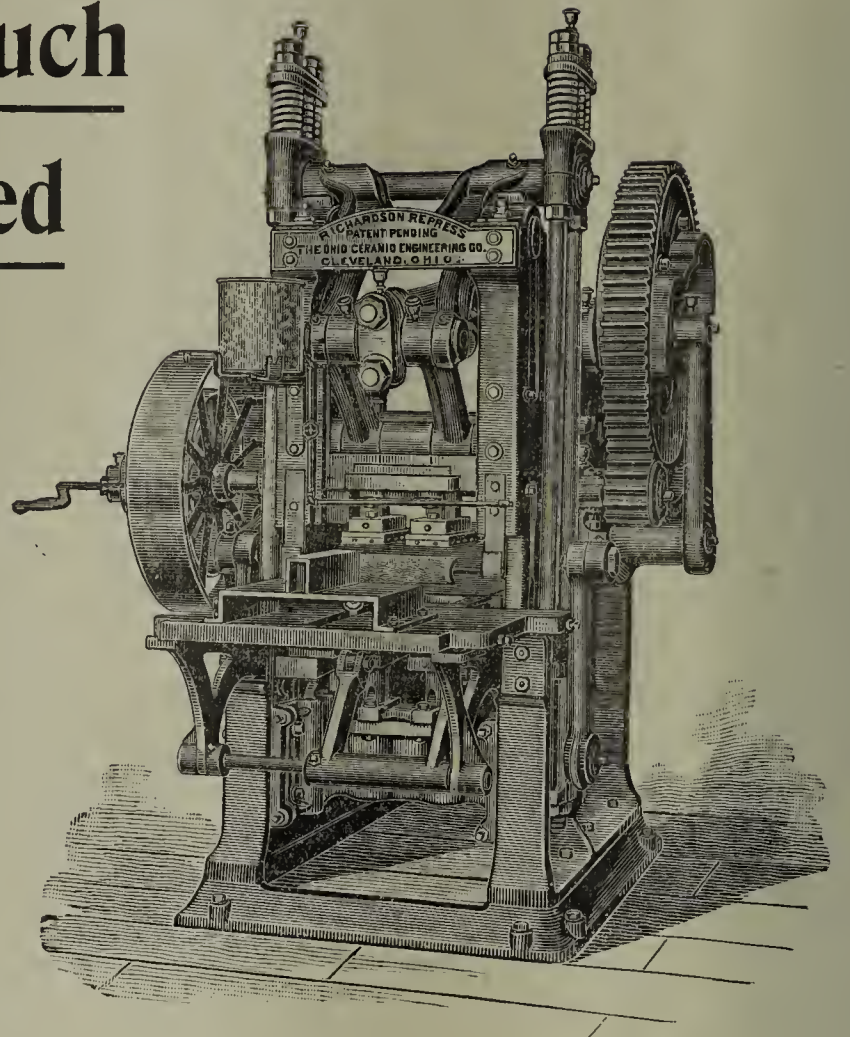
FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.



Very Much Surprised Indeed



That's the frame of mind that certain manufacturers of clayworking machinery say they will be in, if we continue in the business after disposing of what machines we have already built. Notwithstanding these opinions, however, **we are in the business to stay**, and why shouldn't we be? Our machines are superior in many ways to all others—and cost no more than those of inferior make. The **RICHARDSON REPRESS, Improved SCREEN and AUTOMATIC FEEDER and HOPPER** are described in our catalogue. Let us send you a copy.

The Ohio Ceramic Engineering Co., Cleveland, Ohio.

The Potts Mould Sander.

Simple in Construction, Strong and Durable. Never breaks or Causes Delays.

• • •

THE BROCKWAY BRICK COMPANY,

Manufacturers of Superior Quality Building Brick.

Fishkill-on-Hudson, N. Y., October 23, 1897.

Messrs. C. & A. Potts & Co., Indianapolis, Ind.

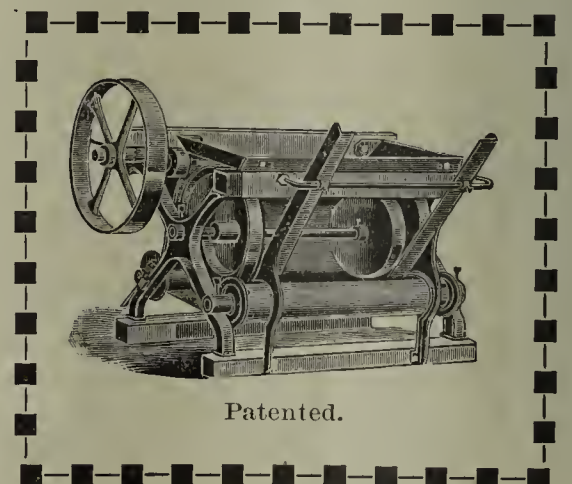
Dear Sirs—We have used four of your Mould Sanding Machines the past season, and they have given us entire satisfaction, neither one of the four having lost any time from breakdowns, or delays of any kind.

Yours respectfully,
BROCKWAY BRICK COMPANY.

• • •

This is a great money maker. A boy does the work better than can be done by hand; no sand wasted; is easily adjusted to suit any size mould.

We also make a specialty of Brick Moulds for machine or hand, made of all cherry, bound with extra heavy steel. You will find our prices right.



C. & A. POTTS & CO., 814 to 824 W. Wash. St., INDIANAPOLIS, IND.

THE HARRINGTON & KING PERFORATING CO.
CHICAGO, ILL.

THE H. & K. P. CO.
PERFORATED SHEET STEEL
FOR
CLAY SCREENS

SEWER PIPE
BRICK
FOR CHUTE
SCREENS.
TERRA-COTTA
FOR REVOLVING
SCREENS.
DRY PAN
SCREENS.

Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.

The MONARCH

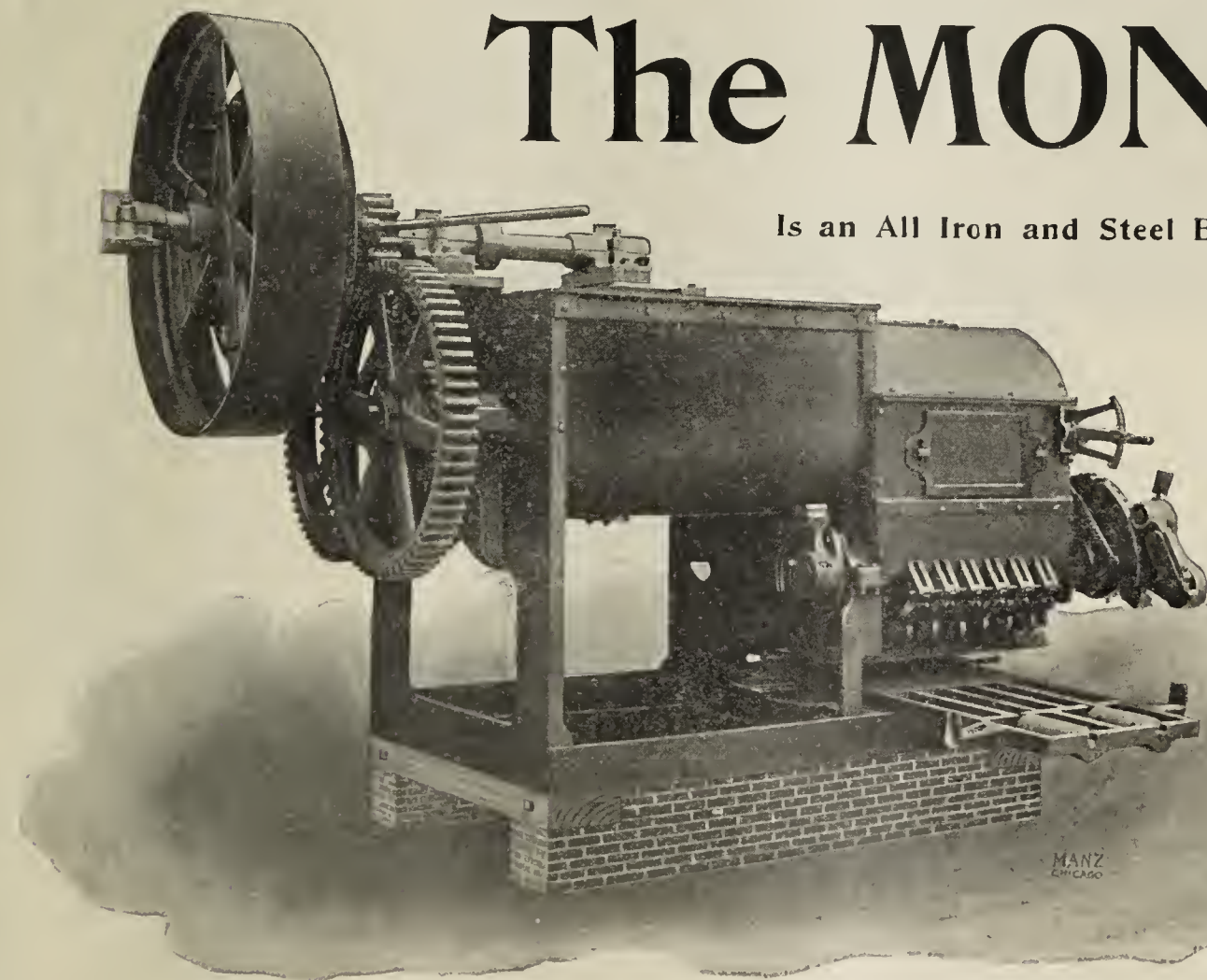
Is an All Iron and Steel Brick Machine with

Double
Pug Mill.

...

SIMPLE
IN CON-
STRUCTION,
DURABLE
AND . . .
POWERFUL.

...



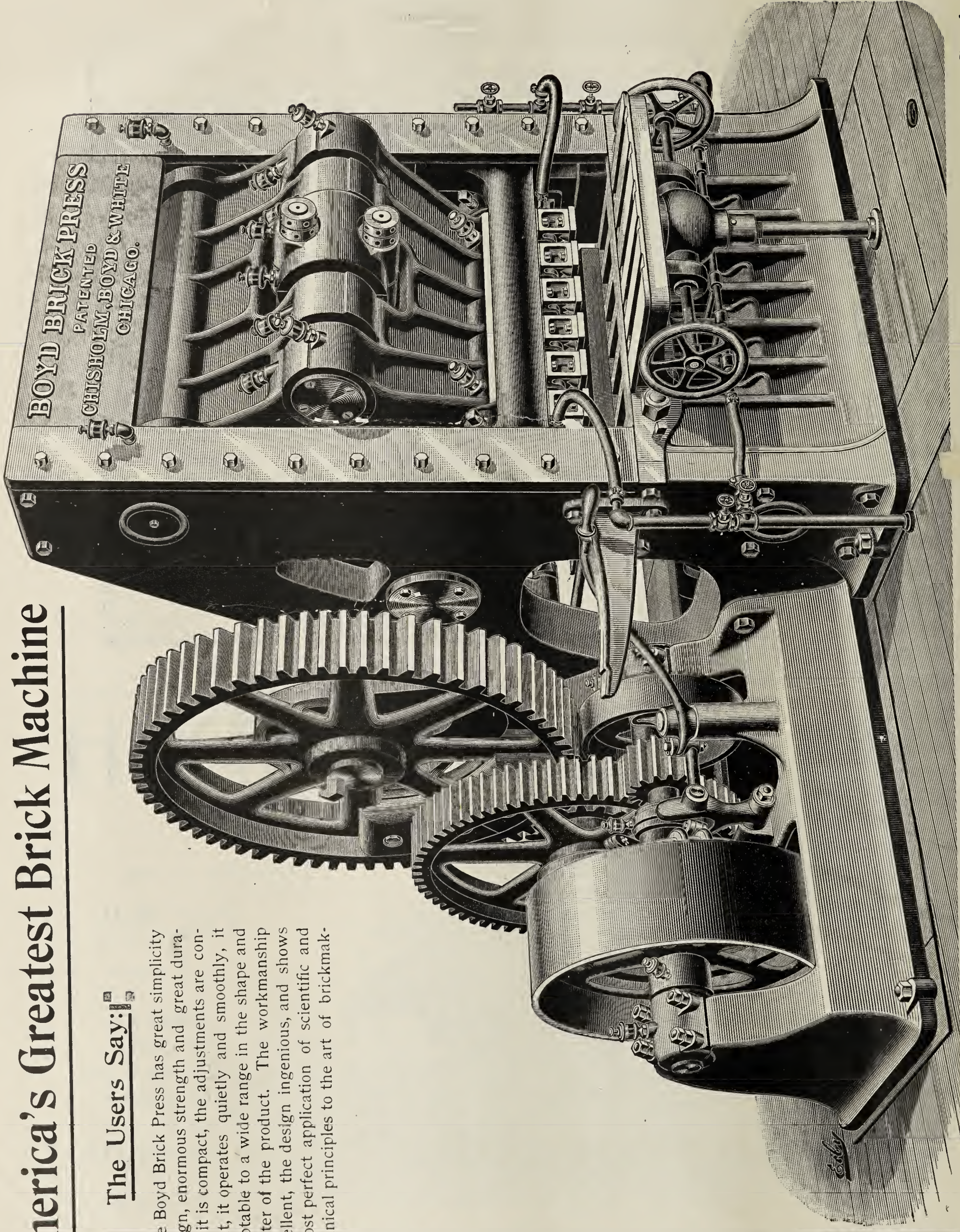
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"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



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We will construct and equip a Brick Plant of any capacity desired, for any responsible party, furnishing Brick Machines, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of Brick, and turn the Plant over to him in proper working order, under guarantee of satisfactory results as to quality of product and cost per thousand; the loss to be ours in case of failure.

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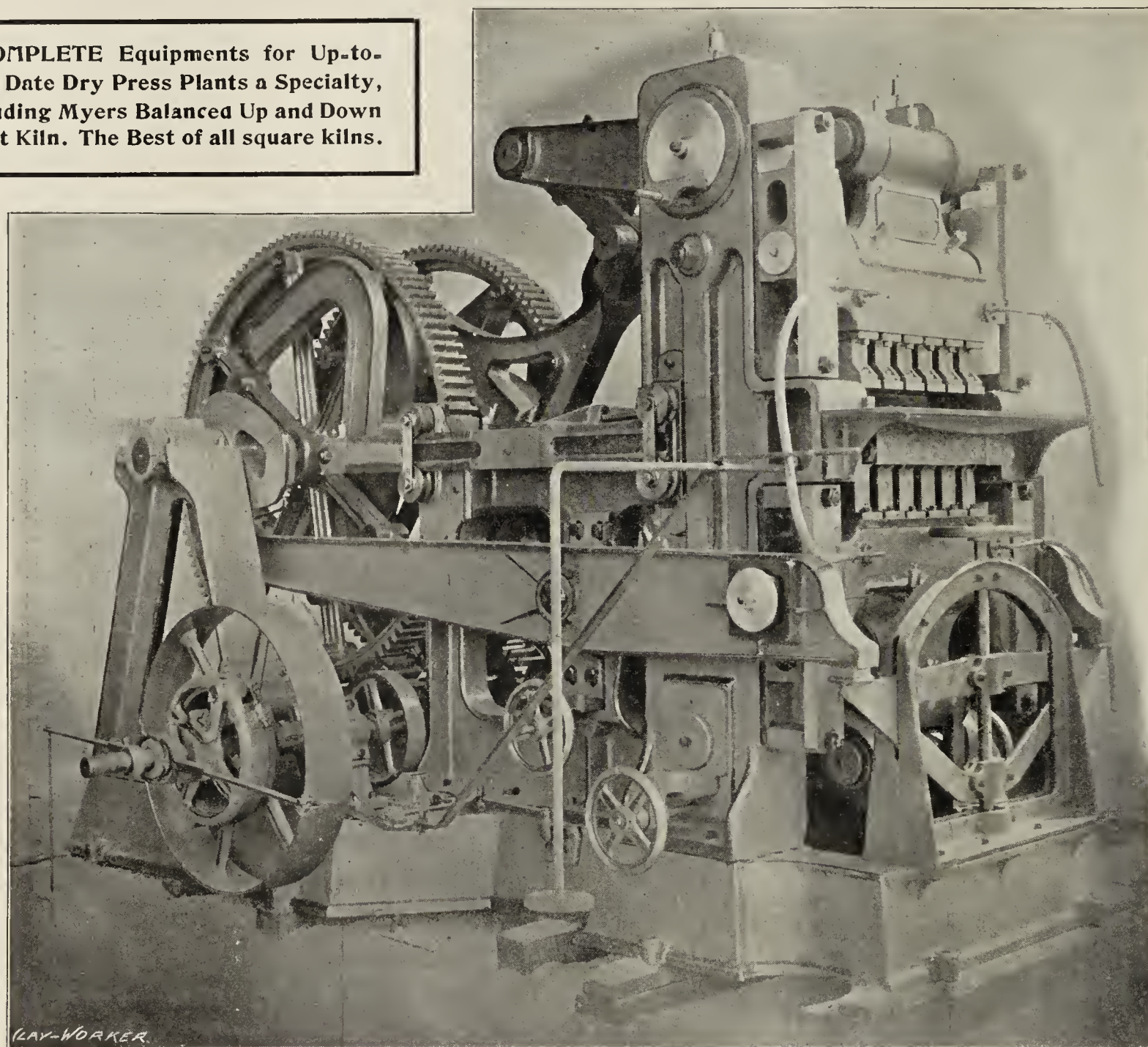
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THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

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The Fernholtz Brick Press Co.,

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THE inexorable law of the "Survival of the Fittest" is well illustrated in the continued success of the **SIMPSON BRICK PRESS**. It was one of the first successful dry presses manufactured in America and from its introduction has held a leading place. The improved **SIMPSON PRESS** is a thoroughly up-to-date machine and embodies many excellent features, that make it invaluable to the brickmaker who wishes to make the best quality of Press Brick—at moderate cost.

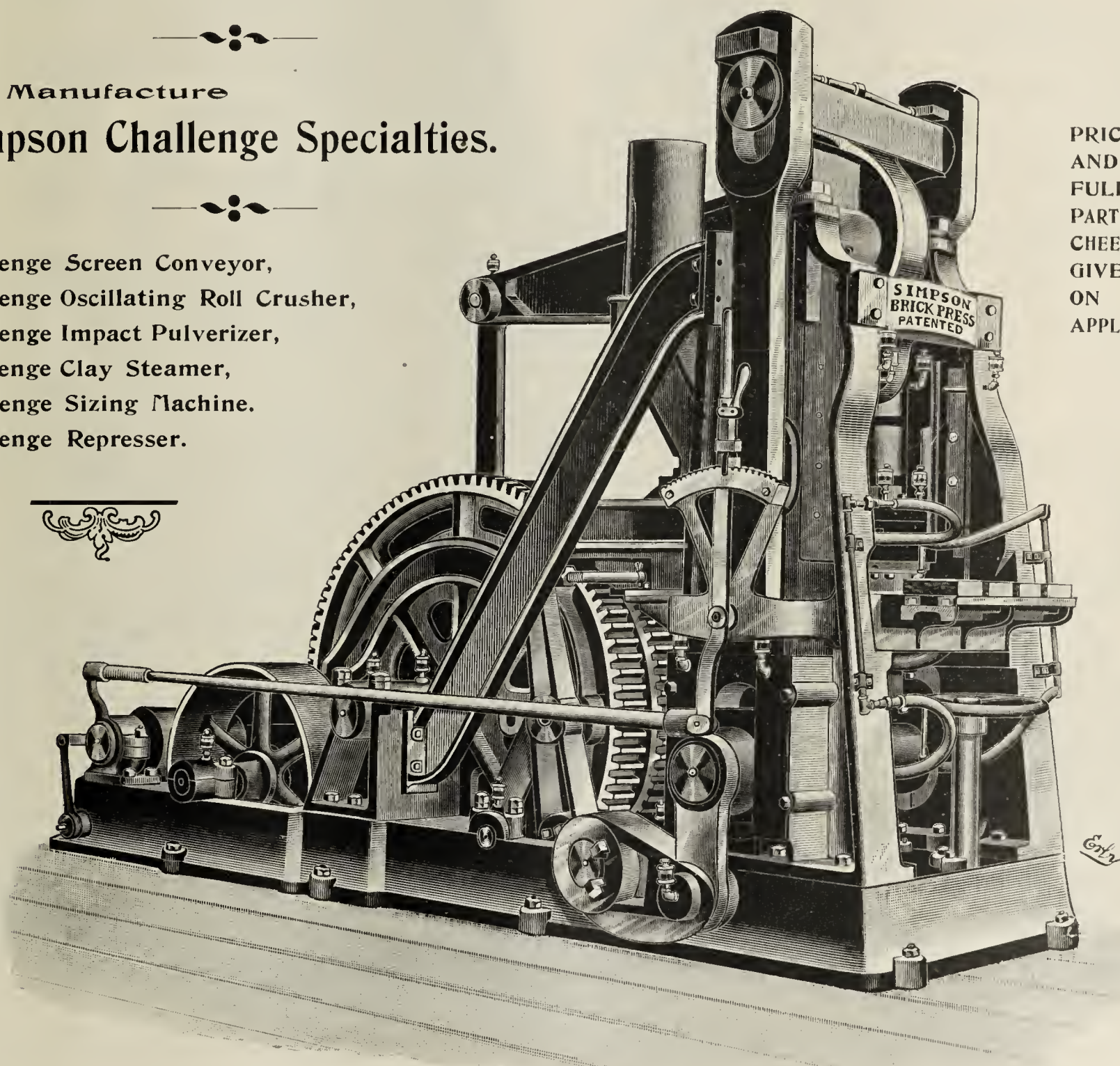
We make a specialty of complete equipments including every device required on a modern press brick plant. Don't fail to get a list of our new improved Challenge Clay Preparing Machinery.

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Simpson's 4-Mold Brick Press, Model AA, New Style. BUILT IN 4 SIZES.

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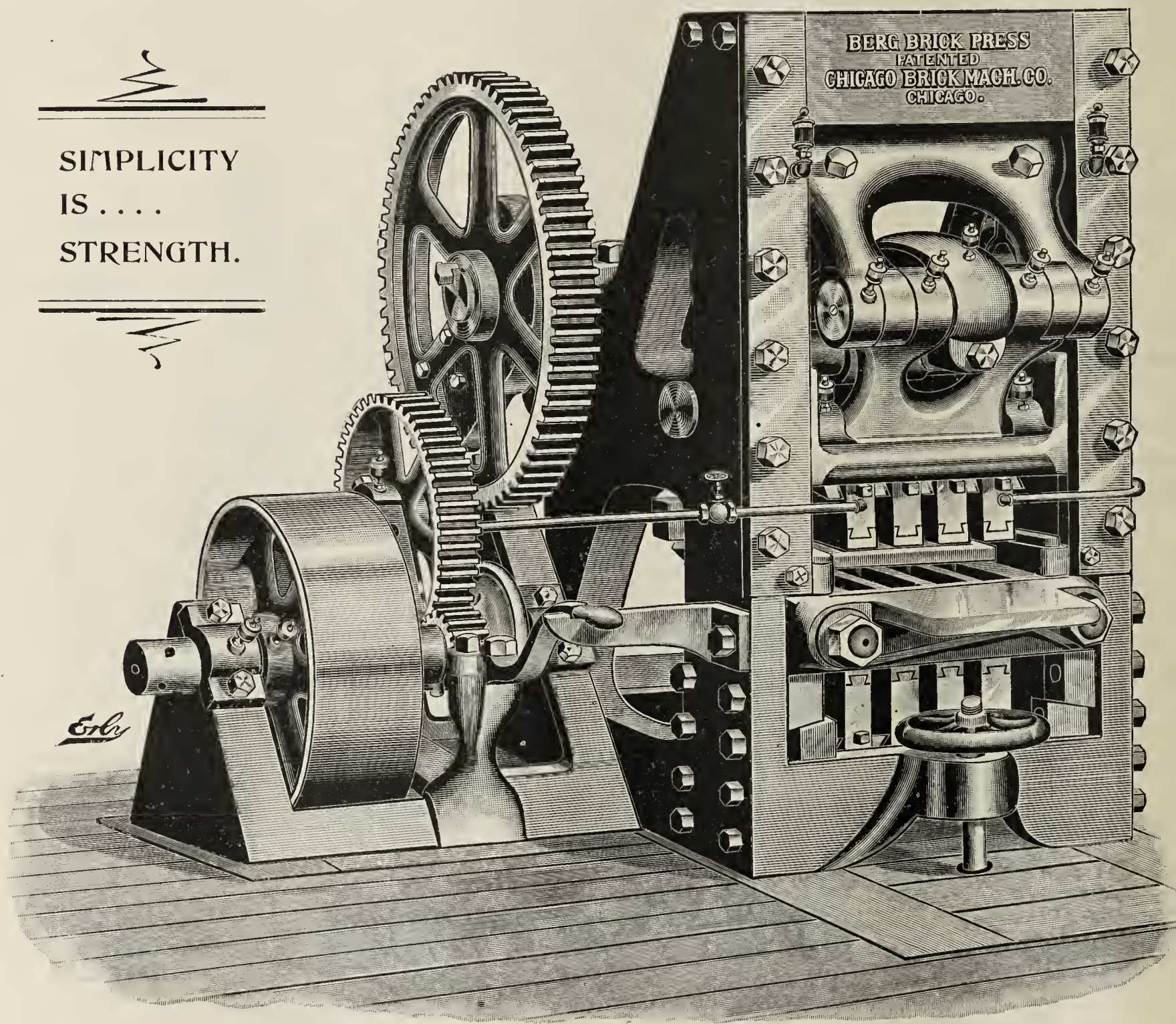
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Absolutely Unbreakable.

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No Experiment, has been running successfully more than a year. Simplest and Strongest of all Dry Presses. Many new features. Send for Circular.

Our Stiff Clay Machinery is just as good in its line as our Dry Press. Most modern in Design and Construction. Makes highest grade of Paving and Building Brick and Drain Tile. Also the latest and highest development of Soft Clay Machinery, combined Disintegrator, Pug Mill and Brick Machine. Only successful down delivery mill for making large tile.

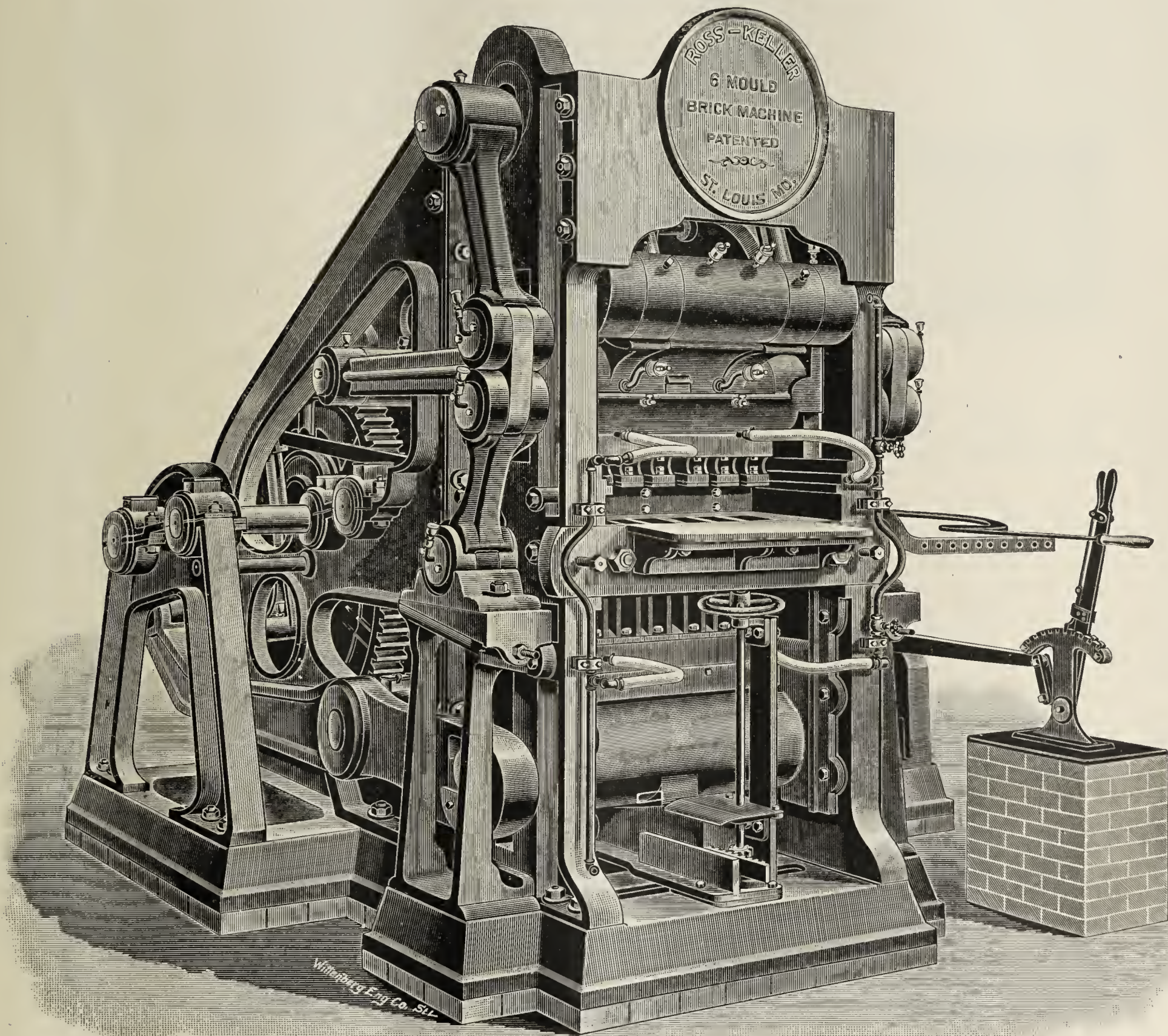
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The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

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The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

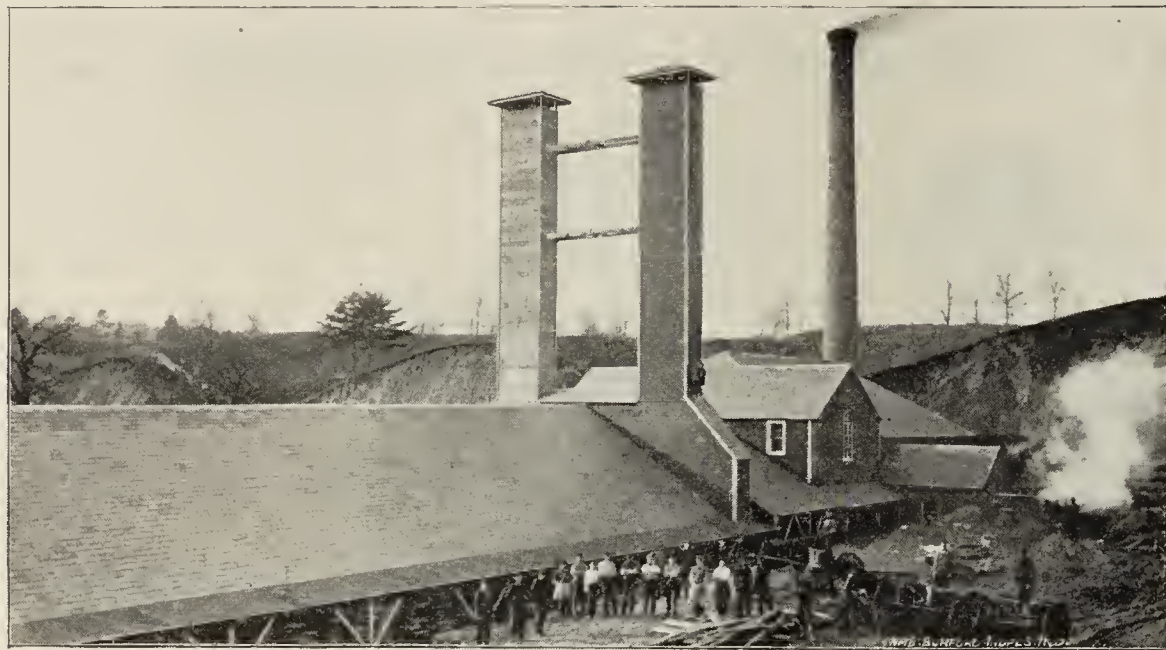
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Ross-Keller Brick Machine Company,

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ST. LOUIS, MO., U. S. A.

A PICTURE AND A LETTER.



Best Brick Co's Plant, Mechanicsville, N. Y.

THE STANDARD DRY KILN Co.,
Indianapolis, Ind.

We send you photograph of our Drier, and would say in regard to working of Drier that it has done all we expected and all you claimed for it.

As we only used it about six weeks before shutting down, we cannot say much as to cost of running on account of the extreme cold weather, which necessarily would take more coal; but even under unfavorable conditions we had no trouble in turning out 43,000 thoroughly dry brick a day, and from the way it has worked in cold weather we know we can average that many every day and dry them all right.

Yours very truly,
BEST BRICK CO.,
W. N. CARY, Sec.
Mechanicsville, N. Y., Jan. 17, 1898.

The STANDARD IMPROVED BRICK AND TILE DRIER

Can be depended upon. There is no chance about it. It works good to-day, to-morrow, next day, next month, next year. Whether the conditions be favorable or otherwise—whether the thermometer be up or down—it does its work; if given ordinary attention.

The fact that its output is large is quite important. The more brick, the more money. But the fact that the drying is done thoroughly and well, is even more important.

Besides being a "money-maker," The Standard Drier is a reputation maker. **Isn't that the kind you want?**

Out of Other People's Mouths.

"Our entire output is made from a Shale clay, which is difficult to dry; but The STANDARD DRIER has successfully accomplished its purpose and aided us greatly in making a VERY HIGH REPUTATION for our goods."

Terra Haute (Ind.) Brick
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"The 'STANDARD' is drying my soft mud brick PERFECTLY."

Brother Brickmakers, if you contemplate putting in a Drier, don't fail to correspond with this Company."

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"We are drying 40,000 soft mud brick every day with The STANDARD DRIER. They are acknowledged by all brick experts to be the strongest and most perfect brick in this market."

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"I make 35 M stiff mud brick every day and have NEVER HAD TO SET A WET BRICK. I look upon the purchase of The STANDARD DRIER as one of the best investments I ever made."

JAMES FLOREY,
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SEND FOR OUR BOOK, ENTITLED "A DRIER THAT MAKES MONEY."

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THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX.

INDIANAPOLIS, IND., APRIL, 1898.

No. 4.

Written for the CLAY-WORKER.

TESTING SEWER PIPE IN MELBOURNE, VICTORIA.

BY F. A. CAMPBELL, C. E.

AS I HAVE PREVIOUSLY STATED in connection with my papers on the "Clayworking Industries of Victoria," the Melbourne Board of Works, now carrying out the great sewerage system for the city, is very particular as to the quality of goods required for the purpose in hand.

Among the requirements, of course drain pipes are one of the most important, and of these a very large number of various sizes are required. At the present time a very considerable

which the contracts are entered into by the various clayworkers tendering are briefly as follows: The pipes are to be salt-glazed vitrified stoneware, made of plastic clay, containing a large proportion of silica, and free from limestone and lime. The clay is to be thoroughly worked. The pipes are to be thoroughly burned, completely vitrified, free from splits, cracks or other defects. They are to be uniformly and thoroughly glazed, both internally and externally. The pipes, bends and junctions to be of the exact form and dimensions shown on the drawings supplied. The straight pipes to be truly cylindrical, the branches set at the proper angles, and the curved bends to be truly and exactly curved as shown on the drawings.

The pipes, on delivery, shall be submitted to the tests speci-



TESTING PIPES WITH "DUMMY" AND HAMMER.

portion of the reticulation has been done. It is still going on actively, and will for some time to come. Various depots in or near the city have been established for receiving, testing and storing the pipes until wanted. One of the chief of these, situated close beside the Princess Bridge railway station, I visited recently, and took a few views to illustrate the methods adopted by the Board. (See photos 2 and 3.) The conditions under

fied hereafter; all pipes, bends, etc., which do not pass satisfactorily such tests shall be at once removed by the contractor. The nature of the tests and method of carrying them out will be gathered from the following description: On being brought into the yard, the pipes are stacked conveniently for testing purposes. After being carefully inspected for uniformity and snitability of burning and glaze, they are rung with a wooden

mallet; sometimes a considerable number will fail to pass the first test. The trueness of shape is then tested by passing into them a wooden dummy, straight or annular, according to shape of pipe being tested. (See photo 1.) Further, the outside diameter is tested by a ring of a quarter of an inch clearance. All



LOADING AND UNLOADING THE PIPES.

pipes not meeting these tests satisfactorily are promptly rejected.

Those passed are taken to the shed, where, close by the tower surmounted by the water-tank, are ranged three hydraulic presses. Fixed into these, their ends closed by iron plates covered with thick rubber, the water is admitted from the water-tank, which is thirty feet high, giving a pressure of fourteen pounds per square inch. When under this pressure they are repeatedly struck with the wooden mallet, and any showing the smallest sign of leakage are at once rejected. (See photo 4.) About five hundred nine-inch pipes may be put through in a day, and the rejections will vary from 10 to 20 per cent. Tests are also made as to permeability and strength against cross-breaking of as many as may be considered necessary. The pipes are thoroughly dried, and are then immersed in water, and it is required that they shall not absorb more than 4 per cent. of moisture in twenty-four hours. Lastly, when placed on bearers eighteen inches apart, they are required to bear a cross-breaking strain of one thousand pounds.

As the officers of the Board are very stringent in carrying out the tests, the number rejected is considerable, notwithstanding that the pipes now made are a long way superior to anything turned out in our yards before the sewerage works were commenced. Most of the contractors consider the Board and its inspectors unduly severe, and of course cases occur in which perfectly good pipes are rejected for trifling causes. On the other hand, a great responsibility rests upon the Board, and the public would not be satisfied unless the greatest precautions were taken to insure that the very best material only was used in connection with such a vital work as the permanent underground sewerage of a great city.

The rejected pipes, moreover, do not by any means represent total loss to the contractors; the bulk of them are quite saleable and perfectly suitable for other work, being in most cases really better than those until recently supplied to the public for ordinary purposes.

WE EXPECT TO.

Editor Clay-Worker:

Enclosed find \$2 for the continuation of your good paper for the year 1898. We look for each issue with as much expectancy as our evening journal. May you live long and die in active service.

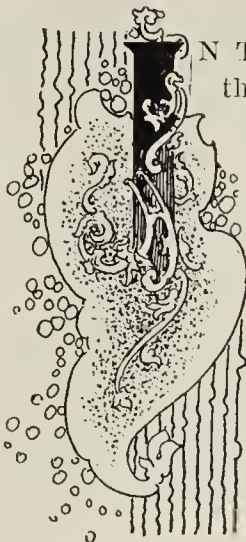
C. H. MERRICK.

Syracuse, March 14, 1898.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK—Seventh Paper.

—Glazed Brick.—



IN THIS PAPER we will try to discuss some of the chemical principles involved in glazing. To do this fairly satisfactorily, without entering too much into technical details requiring a knowledge of chemistry, is not an easy task. Much must be left unsaid that would assist in the understanding of the process. But a break in this direction must be made sooner or later, and the writer hopes that more able hands than his will take up the work. Much has already been accomplished through the researches of able men like Seger, Hecht, Schumacher and others, but the work of these men is available only to chemists. In interpreting some of the fundamental principles of glazing it is the writer's main object to point to the importance of chemical knowledge, and to show that in modern glaze-making the services of a ceramic chemist—not a maker of only analyses—will be found of the greatest financial value. Such a man would not advise the manufacture of glazed brick with a clay or by a process not suitable for the purpose, and there would be no excuse for wasting money in fruitless enterprises. There is no need of fearing that front brick manufacturers would go into a new branch without carefully considering its drawbacks and possibilities. Our American front brick men are the very last to rush headlong into a new thing. The danger lies with the new and inexperienced members of the craft.

In order to promote clearness, I have divided the subject of



STORAGE AND TESTING DEPOT FOR SEWAGE PIPES.

the chemical principles of glazing into the following subdivisions:

1. Relation between silica and the fluxing bases.
2. The fluxing value of the bases.
3. The regulation of the melting point of a glaze.
4. The action of heat upon the glaze.
5. Classification of glazes.
6. Properties of the different glaze types.
7. The chemical action of the glaze upon the surface of the body.
8. The influence of the fire gases.

9. The part played by sulphuric acid.
10. Colors.

In a previous paper we have already seen that all glazes and enamels are silicates—that is, chemical compounds between silica, which acts as an acid, and bases like potash, soda, lead, etc. We have also seen that boric acid, obtained from borax, may to some extent take the place of silica in the lower-melting glass mixtures. In the following discussion let us call all the bases like soda, potash, lead, RO, the alumina and iron R_2O_3 , and let us call silica by its chemical name, SiO_2 . We do this in order to be able to indicate the composition of a glaze briefly. These three expressions represent three kinds of substances which enter into glazes, and each has its marked peculiarities. The RO elements are the bases or fluxes, the R_2O_3 substances are neither bases nor acids, but keep neutral and yet perform an important office, as we will see later on; the SiO_2 , of course, represents the acid. Right here let it be said, however, that iron in glazes melting at higher temperatures has no right to be called an R_2O_3 element, as it then behaves exactly like any ordinary base.

The bases combine with silica in definite proportions at certain temperatures. The higher the temperature the more powerful is the action of silica, that is, the greater a quantity of bases is required in order to saturate the acid. But at a given temperature the silica can unite with only so much of the RO elements. If we do not give the SiO_2 sufficient RO, the glaze will not melt to a proper glass; it will be more or less stone-like. Likewise, if too much RO is added the composition will either be stone-like or it will form a poor kind of a glaze of unstable properties. Thus we have quite definite limits to which our glazes must conform.

The low-fusing lead glazes must keep within the formula RO 1.5 SiO_2 to RO 3 SiO_2 ; the whiteware glazes within RO .1 R_2O_3 , 2.5 SiO_2 and RO 4 R_2O_3 , 4.5 SiO_2 ; the slip and porcelain glazes between RO, .5 R_2O_3 , 5 SiO_2 and RO, 1.25 R_2O_3 , 12 SiO_2 . Glazes in which the acid and bases are in the right proportion, and are satisfied, so to speak, we will call neutral; such in which there is not enough silica are basic, and those which have too much silica are acid glasses.

Potash, soda, lime, magnesia, lead, barium, etc., are all fluxing bases which enter into our glazes. It is very seldom that we have a compound consisting only of silica and one base; as a rule, two or more fluxes are used in the same glaze. It has been found that the more fluxing elements enter into a composition the lower will be the relative fusing point. For instance, a mixed lime-potash-soda glass melts easier than a lime-potash compound. The alkalis alone could not produce a glaze because their silicates are all soluble in water, a fact of which the so-called water-glass is an instance. Lime and magnesia alone will not produce any transparent glass; they simply vitrify to a stone-like body.

It has been found by experience that not all the bases have a like fluxing power; some produce more fusible silicates than others. According to the fluxing power, the ordinary bases rank as follows, lead oxide leading, it being the most active one: Lead oxide, barium, potash, soda, zinc oxide, lime, magnesia, alumina. Similarly, the coloring oxides vary in activity, and here copper oxide leads, it being almost as powerful a flux as lead oxide; then follow the oxides of manganese, cobalt, iron, uranium, chromium and nickel. From this list it is seen that the heaviest bases are also the most fusible ones.

The melting point of a glaze is said to be that stage in which the composition has formed a glassy coating, but without having melted to such a degree of fluidity that it will run. The point of melting is influenced by the quantitative as well as the qualitative composition. According to Seger, the following relations determine the melting point:

1. The relation between the fluxing bases and the silica.
2. The kind of fluxes present.
3. The contents of alumina against the other bases and silica.

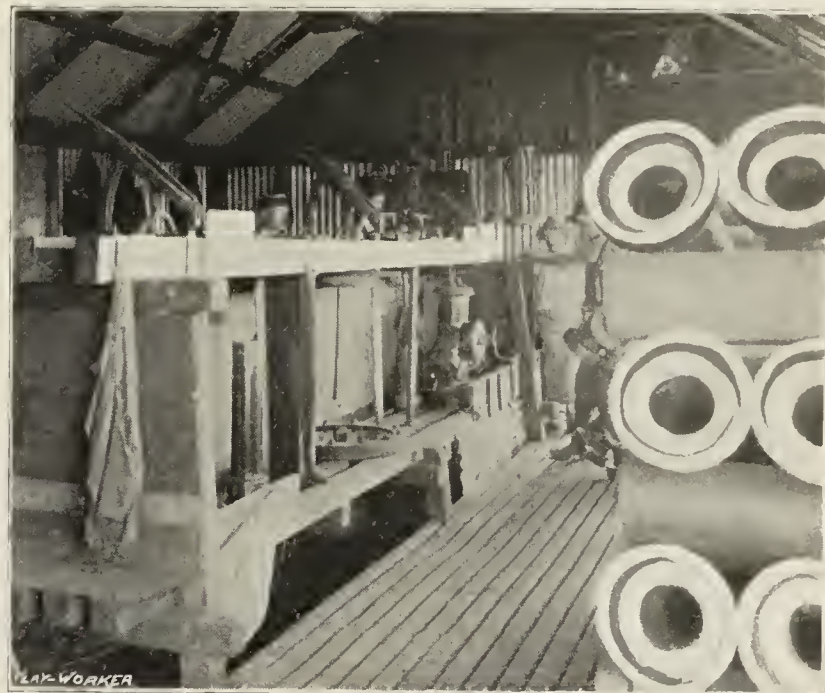
4. The proportion between silica and boracic acid in the latter is used as a substitute for silica.

1. Ordinarily the melting point of a certain glaze may be changed by increasing or decreasing the contents of silica. Increase of silica renders the glaze more infusible; a decrease does the reverse. A compound containing too much silica, if not brought to a higher temperature, corresponding to the surplus of silica, will show devitrification—that is, crystalline segregations will render the glass more or less opaque. By the way, right here is where alumina plays an important role. It keeps the silica and the silica compounds from crystallizing out. Likewise, where a composition has not sufficient silica, or is accidentally brought to too high a heat, alumina prevents the “running” of the glaze.

2. That the different bases differ in fluxing power we have already seen, and we know that an equivalent amount of lead oxide added to a given glaze will render the latter more fusible than an equivalent quantity of lime.

3. Alumina, as has already been mentioned, is not a real flux, because on increasing its contents the melting point is raised also. It is only in the high temperatures of the porcelain kiln that it may be regarded as a flux.

4. Boracic acid forms with metallic oxides a series of compounds—borates. It thus resembles silica, and it can to some extent be substituted for the latter. Borate and silicate glasses



SHED FOR TESTING BY HYDRAULIC PRESSURE.

may be mixed in any proportion. However, the great difference between the two compounds is the greater fusibility of the borates, for we know that boracic acid alone melts already at a low red heat. In boracic acid we have a very convenient means of reducing the melting point of a glaze without disturbing the ratio between the base and acid.

Summing up, we have several means for regulating the melting point. Assuming that we have a glaze composition which we want to melt at a lower temperature, we can reduce the melting point in the following ways:

First, by reducing the silica contents or increasing the fluxes. Of course, we must keep within the limits of acidity, or a tendency to “run” will be imparted to the glaze.

Second, by substituting an active flux in place of a more inactive one. We may thus put in place of lime lead oxide in equivalent quantities.

Third, by increasing the number of fluxes. For instance, where we have a glaze containing only soda and lime, we may replace part of these by potash and magnesia.

Fourth, by decreasing the contents of alumina. One should, however, be careful not to go too far in this direction, as devitrification is liable to take place.

Fifth, by substituting boracic acid for silica in equivalent quantities.

In case it is desired to make the glaze more infusible, the reverse will have to be done.

It is the office of heat to bring the glaze ingredients to fusion, thus forming the glassy coating which we call glaze. When heat is first applied to a raw glaze, the mechanical water is, of course, driven out immediately. At a dark red heat the combined water of the glaze ingredients and the different gases, carbonic acid, nitrous oxide, are beginning to be evolved gradually. As the heat steadily rises, vitrification commences to take place. All this while the gases which could not escape before are bubbling up, and as the fluxing action begins to take place another gas which could not be expelled at lower temperatures is driven off. This gas is sulphurous acid, originating from the sulphates of the glaze or brought in by the fire gases. This compound is most reluctant to leave. It is the cause of ugly bubbles, which, if the firing is done too rapidly, will leave their marks even after fusion. As the glaze becomes viscous the sulphurous acid finds great difficulty in escaping. But as soon as fusion has taken place, the bubbles are disengaged quite rapidly. Time must now be allowed for this evolution of gas to cease, for if the fused mass were to be cooled at this stage the bubble marks would show quite conspicuously. It must not be supposed that the combination of the ingredients in fusion is a very rapid process; on the contrary, only after being exposed to the heat for some time are the different elements drawn into the silicate-forming process. The composition of the now fused mass keeps changing constantly, for a new action takes place—the action of the fused silicate upon the body. It is impossible for a melted silicate to be in contact with another silicate without attacking the latter. If the glaze is an acid one, bases are taken from the body; if basic, silica is taken up. A neutral glaze has the least solvent action.

The rate of cooling, also, has considerable influence upon the glaze. Slow cooling, especially if the contents of lime is quite high and that of alumina rather low, has a tendency to produce opacity. For clear glazes the cooling should proceed as rapidly as possible.

It is not very easy to give a consistent classification of glazes and enamels, although such divisions have been made quite frequently. The most practical classification, it seems to the writer, is one in which the lines are drawn according to the melting points of the respective glazes, irrespective of use. According to this, four groups may be distinguished, as follows:

First, soft lead glazes, earthenware glazes, alkali-lime-boracic acid glazes, yellow-ware glazes, faience glazes or tin enamels.

Second, whiteware glazes.

Third, salt glazes.

Fourth, porcelain glazes.

The range of temperature embraced by this list is quite extensive, starting, as it does, at cone 010 and reaching up to about cone 15.

The glazes fusing at the lowest temperatures are the so-called earthenware glazes. These are very simple in their composition, consisting mainly of lead oxide and silica, with a small percentage of alumina. Often the resulting lead silicate is so basic that it has practically no resisting power against atmospheric influences. The very simplest glaze thus produced is made from about 71 parts (by weight) of litharge and 29 of quartz sand. Through the addition of alumina, introduced by about 5 per cent. of clay, the composition is greatly improved. Another improvement is the addition of some other base, as, for instance, lime, to replace a small part of the lead oxide. Owing to the limitation by the low temperature, the quantity of lead thus removed cannot be large. Such a composition would be represented by the following: 65 parts (by weight) of red lead, 16 parts of plastic clay, 14 parts of quartz sand, and 5 of chalk. In some places a primitive glaze is compounded by simply mixing together about half (by measure) of a red-burning clay and half of red lead.

In the alkali-lime-boracic acid glazes the lead is entirely done away with, potash, soda, lime, borax, quartz sand and clay

being the ingredients of the composition. This class of glazes has as yet found little application, owing to the difficulty of preparation and the somewhat higher temperature required to fuse it. Owing to the solubility of the alkalies and borax, the mixture must first be "fritted"—that is, melted to a glass in a pot furnace. This glass is then ground together with the clay, and is then ready for use. There is likewise some difficulty in obtaining clear glazes, as there is a strong tendency to opacity, especially on slow cooling.

The yellow-ware glaze is simply a lead composition melting at a somewhat higher temperature than the earthenware glaze, and differing from the latter in that it is applied to a burned buff-colored body. The well-known Rockingham glaze is a modification of this kind of glaze, the brown color being obtained by a high percentage of manganese. The Rockingham glaze might be represented by the following composition: 120 parts (by weight) of white lead, 8 of manganese, 20 of kaolin, and 40 of quartz sand. All the so-called majolica glazes belong, chemically, to this group of lead glazes, in which the silica is often partially replaced by boracic acid. The glazes of the last description require, of course, to be fritted.

The faience glazes, or rather enamels, are lead glazes in which the tin oxide is suspended, thus producing opacity. All of this class of enamels require fritting. These compounds are rather peculiar, inasmuch as they require a limey body; they will not stand on any other clay. Though often very beautiful, the enamels are not suitable for exterior application; their use is mainly confined to interior decoration. The following is a typical composition: 40 parts of tin ash (a mixture of 2 parts of lead oxide and 1 of tin oxide), 20 of kaolin, 20 of borax, 10 of chalk, and 52 of quartz sand.

INSURANCE, FIRE AND ADJUSTMENT.

The vital question of this small paper is, Does it pay to insure a brickyard plant or any other property half way? My motive in asking the question is brought about by my having as a bad correspondent of the Clay-Worker sent in several reports of fires. A short time since such a one was sent in and the damage to the extent of \$12,000 to \$14,000 was claimed. The daily paper made it at anything from \$5,000 to \$25,000. Now, by a circumlocution of events I was shortly afterwards invited to a dinner at the house of a friend and an officer of a fire insurance company. Coffee and cigars, and the absence of the ladies ("God bless 'em"—sometimes) gave us an opportunity to talk "shop." My host complained of having had a hard day—a question of adjustment over a fire at one of the brickyards. Naturally, I was interested.

"You see," he said, "the main trouble with the people when they insure is that if they have a stock worth a hundred thousand dollars they don't want to insure for the full amount, because the premium would be too high, so, in order to evade this, they insure for \$50,000 and get along by paying only half the proper premium. If a fire occurs and they are completely wiped out, they sometimes have the assurance to ask for the \$100,000, on the ground that that was the figure they declared their plant was worth. We then inform them that the face of their insurance only calls for \$50,000. With ill grace they coolly consent to take that. But now comes the grand hitch. As they have insured for half, they have likewise taken upon their shoulders half the risk."

When asked to explain this, he said:

"You see, we first deduct from the amount called for on the policy an amount that would have been paid as a premium on the extra \$50,000 had the property been insured to the extent of the former declared value; and, as they have only taken half a risk, so do we, and that is all we award in the final settlement or adjustment. With reference to the fire at ——— brickyard, the face of the policy called for \$12,500, or just one-half of the declared value, which was \$25,000. In making the adjustment and allowing for salvage, we had to fight this very

question. If these people had insured to the full value, we should have made our award to the full extent of the damage, which was about \$12,000; as it is, they will receive about \$6,000 or \$6,500."

Thanking him for the explanation, I could but reflect that it was a point which every brickyard owner should carefully digest: Does it pay to insure half way or to the full extent? Decide for yourselves, boys.

W. P. LOCKINGTON.

SUCCESS.*

Mr. President and Gentlemen of the Ceramic Association:

I HAVE JUST COME from the Twelfth Annual Convention of the National Association of Brick Manufacturers, which adjourned at Pittsburg last evening. It was the largest, most interesting and instructive of any meeting the Association has ever held. Not only was the attendance large, but the prominence and character of its membership was certainly not inferior to that of former conventions. By no means the least in the galaxy of grand men from all parts of the United States, who took part in the proceedings, was Prof. Edward Orton, Jr., the head of the Department of Ceramics of this University. I am rather glad that he is not present this evening, as his absence permits me to use his name with more freedom than if he were present. It is a pleasure, too, to be able to tell you that those of the graduates of this department who attended the Convention acquitted themselves creditably, and that they have set an example worthy of your emulation. With these preliminary remarks, I come to the little paper I had prepared for this occasion.

When a man is asked to do something for which he has no natural aptitude, and no acquired art, the only wise course is for him to decline. This I well knew when your committee so kindly invited me to address you this evening. Indeed, I did make some feeble protest, but I suppose only in the half-hearted way that challenged a little urging, which was courteously forthcoming, and then—I fell. It was an injustice to you, but in self-defence I must say that you young fellows have no idea what a temptation comes to us old ones, when the chance offers to talk to you, and preach a little, and try hard to make you believe we know a thing or two you have not yet found out.

Your youth, with its dower of promises, is at once a challenge and an inspiration to your elders. They see renewed in you the possibilities that have in some way eluded them. They are fired with a strong desire to hold before you the highest standards, which have sometimes grown dim before their own eyes, and to help you grasp some of the real prizes of life, which in their own haste, or blindness, they have too often missed.

Then, again, your inexperience is an appeal to their chivalry. No man, who has reached the half-century mile stone, can look into the faces of the bright and earnest young men I see before me to-night, without wishing he might help them safely over some of the rough places he has blundered and stumbled through himself.

So will you bear with my lack of scholarly training, and my faulty rhetoric, while I try to draw from my twenty-five years of clay-working some homely lessons which may be of service to your future lives? That quarter century has been so alive with scientific research, so fruitful in discovery, and so rich in useful inventions, that we need not marvel to find it the period of greatest progress in the treatment and adaptation of clay. It marks an epoch of unusual interest in an industry as old as civilization. Less than five years ago no American College or University considered the ceramic art of sufficient importance to give it a place in its curriculum. What Ohio, through its State University, has done to give dignity to this art will furnish valuable data for the future historian of cer-

amics. You are enjoying the first fruits of that broad and liberal spirit which has dared to throw some nineteenth century light on an antediluvian art, but while you profit by its benefits, you cannot avoid a corresponding obligation. You are the touchstone by which other commonwealths, and other colleges, are bound to test the value to the State of this innovation.

By your works shall the tax-payer know you, and when he happens to be an old school clay-worker, there is no use blinking the fact that he is going to watch you with a keen, not to say a jaundiced eye. He is a little skeptical about this short cut to the knowledge which he has gained, bit by bit, giving in payment long years of hard work, and scores of costly and often fruitless experiments. He is secretly, if not openly, inclined to believe that while you will come from your college course well versed in the history of your art, keenly alive to its æsthetic values, able to discourse fluently on the comparative values of Oriental and European porcelain, or to give an opinion on the age of an Egyptian vase, or a Tenagra statuette, you can never be expected to master such menial de-



D. V. PURINGTON, Chicago.

tails as mixing, throwing and firing, and much less can you descend to the prosaic labors of making, drying and burning common brick and drain tile. Now, no boy who loves clay, and who loves beauty, can be indifferent to this close relation between the craft of the potter and the sculptor's art, and your studies have missed one important aim if they have not convinced you that the clay-workers' best product will always serve a purpose higher than mere utility.

The man who can make permanent in porcelain, bisque or terra cotta some beautiful ideal of his imagination comes very close to the sculptor in his service to art. I am sure I have often envied my friend (and your friend) Wm. D. Gates, the privilege he enjoys of modeling Cupids and Graces, Venuses, nymphs and naiads, and have turned with a feeling akin to disgust from his gallery of the gods, and more particularly of the goddesses, to the dull monotony of a Chicago brick yard. But the most universal wants of the world are its most prosaic ones, and, however alluring may be the artistic phases of clay work, many, nay, most of you, will find ample scope for your abilities in the manufacture of plain brick and tile. You must learn that

An address delivered before the School of Ceramics at Columbus, O., February 18th, by D. V. Purington, of Chicago.

you are not going to be sought by a busy work-a-day world unless you know how to do its work better and more economically than it has been done before. Upon you will rest the burden of proof that these years of study which you have given to chemistry, mechanics, pneumatics and combustion will enable you to know results rather than guess at them; that your knowledge is ready for practical application when clays are to be mixed and burned, when machinery is to be purchased and set up, when kilns are to be built and used.

Prof. Orton once said that "chemistry is the mainspring of all our knowledge regarding ceramics." Now, this mainspring has not yet found its way into many potteries or brickyards. It is your privilege to carry it there, and to demonstrate its value. Probably the most serious losses that have crippled the clayworkers of the past have been the penalties of ignorance, and of credulity, which is the first cousin of ignorance.

You cannot afford to let your employer feed into his boilers water which would ruin them in three months, or to so mix his clay that his finished product will be unmarketable. After you have forestalled a few of his mistakes, he will begin to place a money value upon your services. But why am I talking to you about employers? There is not one of you who has not in his mind already overleaped that winter of discontent when he must be at another's beck and call. In the future of his dreams he is always the employer, not the employed. Far be it from me to say that this ambition is not a laudable one, if you do not try to realize it too soon. No man is a worse head for having been a good hand, and the discipline of obeying is a very good school for the art of commanding.

I advise you all to serve an apprenticeship in that school after you leave this one, if only to give you time to get your bearings, and find out how many people there are in this big world who do not know you, and have never even realized their misfortune. This balancing of values will farther help you to know and to control men, when you, in turn, must employ them. And here let me say to those of you who by choice or by circumstances are led to follow the less artistic and the more commonplace branches of clay industry: There is this compensation, your highest powers need never rust from inaction. A commodity so universal in its uses must always employ great numbers of men; and one must be a philosopher, a philanthropist, a diplomat, and a general to grapple with the labor question in all its latter-day aspects.

There is no lump of clay so difficult to handle as the one which bears the stamp "homo," and all your skill with the more plastic forms may come to grief through the stubbornness, or cussedness, of the human variety. There is no measure of wisdom you will not need to safely mix, and turn, and mold, the human clay. You may not grind it, and you dare not fire it. Yet, next to the crude material, this human element is the one indispensable factor in your business. When, to his exactions and caprices you add the fluctuations of a varying market, you will find, I think, that the life of the practical clay-worker will furnish excitement enough to meet the most exacting demands.

From what I have said you may infer that I think success a very complex affair. Indeed, I do, if by success you mean that popular achievement which stands for wealth and luxury and social prominence and all the glittering tokens of the prosperous man. I fancy an X-ray turned on that kind of success would show its seamy side, all ragged with anxious days and sleepless nights, tortured nerves, tarnished consciences, battered principles and shattered ideals. Such success I dare not commend to you as a motive worthy your ambition. Fortunately, that higher type of success, the only one which bears the test of time, and in maturer life seems worth the candle, is a far simpler thing. The steadfast pursuit of worthy aims, the determination to be true to one's self, the rational development of a wholesome and honest manhood, is within the reach of every young man before me, and with faith that such a standard is the one you have chosen for your own, I shall close by wishing you all—in your college life and in your larger life hereafter—the most generous measure of that truest success.

Written for the CLAY-WORKER.

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Tenth Paper.

BY E. G. DURANT.



WE WILL GIVE a little attention to arches, and this will lead us to the introduction of bent or curved blocks and the method of producing and treating them. For arching an ordinary width of window or doorway, a single block may be made to do duty, but inasmuch as these are liable to get out of shape in drying and burning, it will usually be better to make of two or more pieces. In Fig. 22 we have a sketch of an arched or segmented window cap, and also a cross-section of the same in connection with the specially cut blocks which cap it. It will be noticed by reference to the cross-section view that the top and bottom of the window cap block are furnished with exterior ribs, the under ones to break joints with and hold in position the window frame, and those on the upper side to enter the blocks resting upon the cap and which it will be noticed are cut away to conform to the curve of the arch, the cross-section view being taken through x—x of Fig. 22. Such cut blocks are scored while green, and are broken apart after burning.

The methods employed in laying out such work are very simple, and such as would naturally occur to any man having a modicum of genius. The radius to which the window cap is bent being known, the blocks which are to form the course lying upon it are placed upon a bench, as shown in Fig. 23. A lath having a scoring point attached is fixed at a proper center to secure the desired radius, and the segment of the arch is then described on the block being treated, the scoring to be done on both faces and across the bottom also (where needed), and deep enough to secure a good break, while not deep enough to prevent the block from being handled whole to dryer and kiln.

It remains to present the method by which curved blocks of any desired radius for caps, arches, bays, etc., are secured. If a horizontal block-making machine is being used, a simple form of horse is made to set at the point of delivery, as shown in Fig. 24, on which to rest one end of the roller pallets, which are made to the curve required for the work in hand, and upon which the blocks are delivered from the machine, instead of upon the usual cutting table. These pallets may be cheaply made, and consist of board or plank sides properly framed together and supplied with removable rolls, as in the case of the ordinary cutting table. A number of these pallets will be required, depending upon the amount of work of this character that is done. When a stream has been run out to the length of the pallet, the machine is stopped, the cut is made and the pallet is removed, and another takes its place. The same rollers may be used for pallets of all the various curves required, so that when rollers are once provided it will only require that pallets of other curves be furnished for any extension of the system or new work in this line. The blocks being borne off on the pallets, are then cut to the required length, and are left to dry on the pallet, if long pieces, three feet or more, and for economy of space these may be set at an angle just off the perpendicular. In order to secure the correct angle for the cut, the device shown in Fig. 23 may again be brought into requisition and adapted to this work.

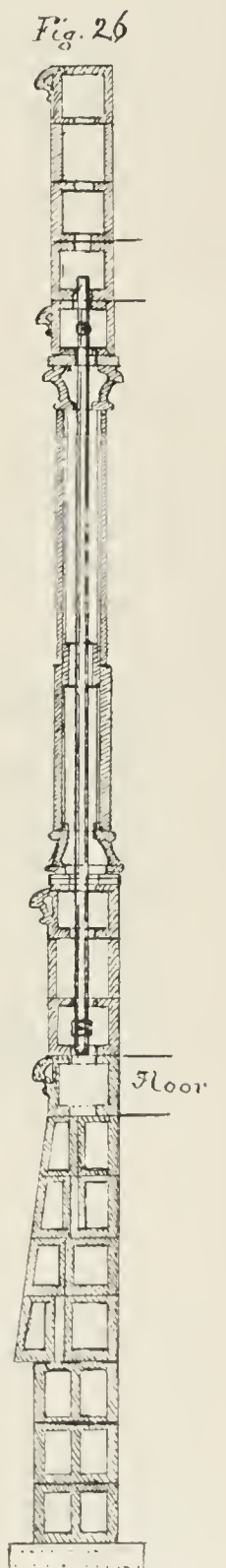
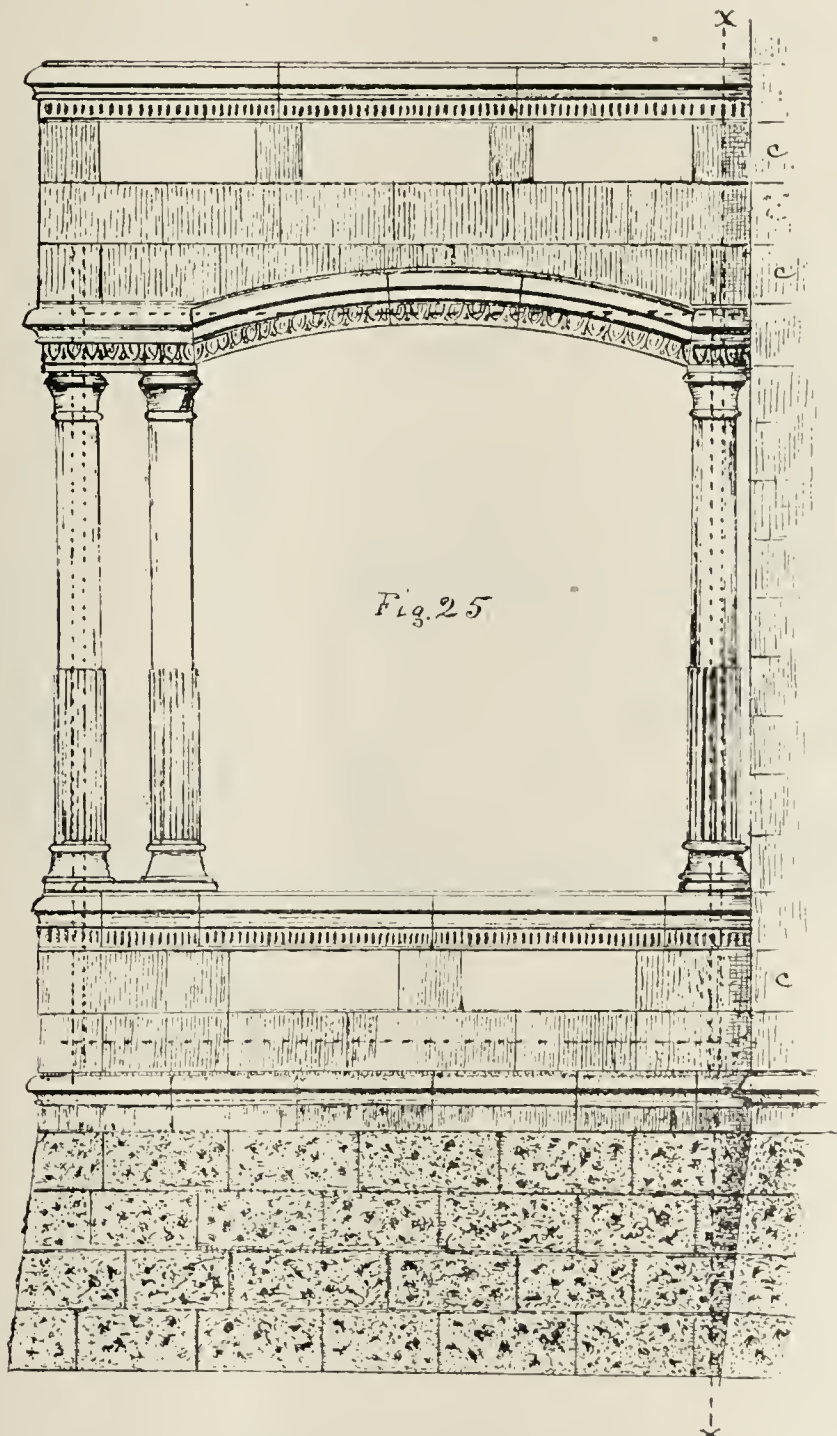
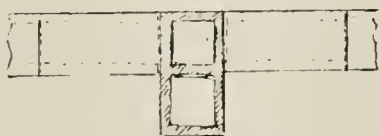
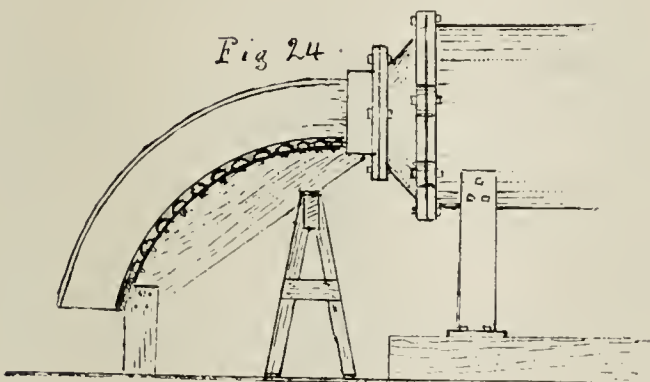
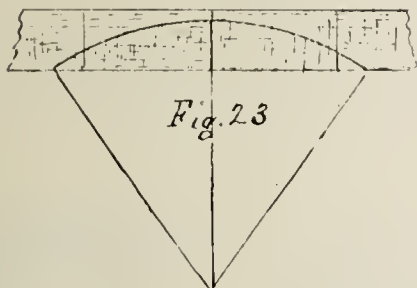
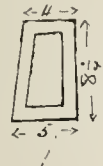
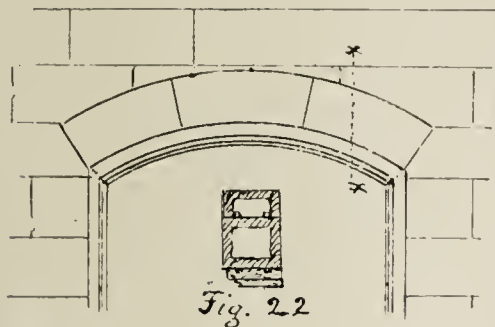
We give in Fig. 25 another example of porch treatment, in which a segmental arch is employed, and which is surmounted with a balustrade of masonry. Arches always entail an end thrust which is very hard to provide against in ordinary masonry construction, especially in porch work, where not flanked with walls to support the thrust, and consequently verandas and porches are seldom seen of masonry, except where such support can be had, or where very heavy and expensive abutments can be provided. In the use of hollow blocks, however,

the demands are easily and naturally met without involving a burden of cost, owing, first, to the comparative light weight of the material, and second, to the simple manner in which strain rods may be used and hidden from sight. We shall refer to other adaptations of this principle later.

The architect and builder will not need to confine themselves to the exact methods now shown, which are only suggestive and admit of various modifications suited to the case in hand. The vertical dotted lines through two of the columns indicate angle iron or pipe sections of suitable dimensions for the pur-

suitable nuts and washers for their adjustment to the work required of them.

In the porch shown, the capitals and bases of the columns are hand-molded; all other work is performed by the machine. The columns, as shown, are 5 feet 6 inches in length, and are made in two sections, as two forming dies are required, the upper portion being a plain 7-inch (outside diameter) cylinder, having three inside ribs, as shown in cross-section sketch, while the fluted section is the same, except as to the external flutings, which increase its diameter to 7¾ inches over all, the internal



pose, and the dotted lines through the course of blocks over the water table, and also over the arch, indicate strain rods connecting the vertical stays. In many cases a sound piece of hard pine, 4x4, may be substituted for the angle iron or pipe, as they are to be securely housed and abundant ventilation is had to prevent dry rot. The vertical openings through corner blocks and supporting columns are a natural provision for enclosing the vertical stays, and the chambers in the horizontal blocks as naturally provide for the strain rods, which are provided with

diameter being the same as seen in Fig. 26. In the abutting ends of these column sections the ribs are cut back some three inches by hand, and thus are made to form a seat for a thimble of a diameter to fit easily within the column, which, cut to a six-inch length and placed within the column, serves as a lap joint, and, cemented in position, unites the sections and makes the column practically as if of one piece.

In connecting the porch with the wall of the building, every other course from the foundation up, except the molded courses,

should lap into the main wall, as indicated in Fig. 25, the corner block "c" being used for this purpose whenever it shall answer better than a horizontal chambered block, and in the manner shown in the subjoined sketch. It is so used at points designated "c" "c" "c" in Fig. 25. It will be apparent to all that in the treatment of this porch we have broken away from the restrictions which were imposed upon us through confining ourselves to the use of the limited number of block forms which had previously been introduced in these papers.

In Fig. 26 we will commence at the foundations and follow the mason in his work to find what we have that is new. Frequent reference to Fig. 26 will be unnecessary on our part, but the reader will be assisted in following us by tracing us in that figure. The cross-section shown in Fig. 26 is drawn on the line x—x of Fig. 25, the underground courses not being shown in Fig. 25, however. The footing course is a block 2x8x16, laid transversely to the line of the wall, and the underground foundations consist of three courses of 8x10 blocks, which brings us to the battened section of the wall lying above the ground. A new form of block being required for such battening, is now shown in annexed sketch. These blocks, constituting the face of the wall, are backed by six-inch plain blocks in the first two

"dental" design shown or any other that may be prepared. That portion of the rail supporting the columns requires a level top, but the intervening sections will be better suited to their work if beveled from rear to front.

The columns have already been fully described. The arch course resting upon them has the same molded face and an egg-and-dart design. It may have the same as the rail if desired. The method of treating this block to secure the proper curve has already been presented. It should have outer ribs only on its upper face for the purpose of securing a lap joint with the blocks which are scored to match the curve and laid upon the arch blocks. The two block courses under the rail surmounting the balustrade are first a course of "b" blocks laid horizontal, with "c" blocks at the corners, while the second course is of half-lengths of 6x8 $\frac{1}{4}$ blocks set on end, except at point of connection with the main wall, where a "c" block is employed. The rail is the same block as used for the rail below—a two-inch pipe is shown doing duty as a stay.

Referring now more particularly to the molded courses, we have in our previous treatment of water tables shown them as narrower than the other wall blocks, in order that a shelf might be formed at the rear face of them, when laid, on which to rest



ROMANESQUE COTTAGE NO. 1, MADE FOR DURANT'S HOLLOW TERRA COTTA BLOCK.

courses, and by four-inch in the next two. If the battened section was run higher than the four courses shown in Fig. 26, the next two courses below would need to be backed by eight-inch instead of six-inch blocks, and the foundation courses below would need to be of twelve instead of ten-inch blocks. It will be noticed that the battened section projects two inches over the face of the foundation wall below, forming a water table at this point.

Capping the battened blocks is a molded water table course, the top of which is even with the floor of the porch. This may either be a six-inch wide block or an eight-inch, with recesses for joist, as will hereafter be shown. Upon this water table two courses of blocks are laid as supports for the porch rail, as is seen in Fig. 25. These blocks are either "b" or "c," as the case requires. The molded block which forms the porch rail must of necessity be of a width to cover the underlying blocks, and also of sufficient width to form a suitable footing for the columns, and may have the same contour of face as the water table, and, as we will show later, may be made in use of the same die, but subjected to an ornamenting roll to secure the

floor joist. If parties desire to economize in an outfit of die forms, one width of die, and that an 8 $\frac{1}{4}$ -inch, may be made to do duty for water tables, window sills, belt courses, porch rails, etc. This is accomplished by cutting out a section of the block, as shown in the annexed sketch, in a manner to receive the floor joist at the proper intervals. The blocks may be simply scored when green and the part removed after burning, or the complete cut may be made and the blocks so treated be set in the kiln as a top course.

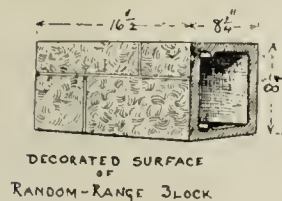
It may be well now to sum up what new forming dies, ornamenting rolls and hand molds have been introduced in order to the accomplishment of what has been presented in this paper. First, we have in our foundations 6x8 $\frac{1}{4}$ and 8 $\frac{1}{4}$ x10-inch blocks, which are very desirable in an outfit. These have been introduced as plain blocks, but it is evident that if the dies are fitted to receive ornamenting rolls, the rolls already named in connection with our "a" and "b" blocks are equally suited to the new blocks. We next have the batten block form, and this can also be ornamented in the use of the same rolls. We shall next require the die for the molded face block, and we have

shown that one die may be made to answer this purpose. We strongly recommend two, one of 4-inch width and the other $8\frac{1}{4}$ -inch; the first to be used for joist courses and also in belt courses where a chimney flue is to be passed, in which case a four-inch block is usually employed; but we have shown how the narrow block may be dispensed with in the joist courses, and it may also be dispensed with in passing a chimney flue by using a scored block, which, broken, will leave a face section of the required thickness. For the columns we need three forming dies, one a $7\frac{3}{4}$ -inch fluted, and the others plain circular dies to produce respectively a column 7 inches in diameter and a joint piece for the column $4\frac{3}{4}$ -inch (outside) diameter. Seven new forming dies in all, none of them of an expensive character. We have introduced one new 4-inch ornamenting roll for producing the "dental" design on the molded blocks.

Of hand molds we need one each for the capital and base of the columns, and for a really good job, and to save "pasting" the corners in the battened courses, we need two hand molds, the one a right and the other a left-hand mold for such corners.

The reader will please remember that these new dies open up a large field which the manufacturer would not otherwise occupy, and to the writer's mind the demand for blocks may be nearly doubled by making such outlay as is required, which, including the special apparatus shown for bending and cutting bent blocks, will not cost over from \$250 to \$300.

We are now prepared to consider the construction of a dwelling of superior design to those heretofore shown, but will be contented to take only a short step in advance at this time.



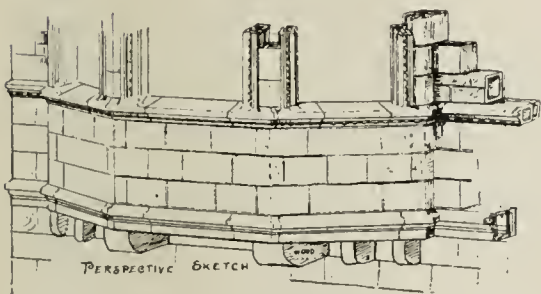
DECORATED SURFACE
OF
RANDOM-RANGE BLOCK



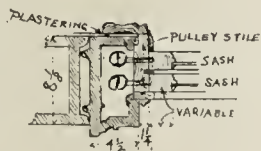
SECTION OF
WINDOW SILL
AND
SILL COURSE



SECTION
OF
WATER TABLE



PERSPECTIVE SKETCH



PLASTERING
PULLEY STILE
SASH
SASH
VARIABLE

In the cottage elevations now given, the main features to be noticed are the molded belt courses and the window casings. A perspective sketch of the window sill block is given, and a feature of the block is shown in this sketch which is worthy of our attention. It will be noticed by reference to the elevations that the sill proper is supplemented with a molded course extending nearly about the building. Notice the line "a" drawn near the top of the block; this line represents the top of the block when used as a window sill, properly beveled as a water shed, while the whole block represents the balance of the course. The same die can be made to do duty in forming both blocks. It only requires that a cheek piece, representing the section above the line "a," be laid into the shell of the forming die, and that a corresponding cheek piece be taken from the core to preserve the uniform thickness of the top wall of the sill when the dies are used for the production of sill blocks.

A sketch is given of an end view of the molded water table block, which, if had, should preferably be four inches wide, for the reasons already given, but may be dispensed with, as has been shown, if parties desire. A sketch is also given of the block used in the body of the building above the window sill course. This block is designated as a "decorated random range" block. The design is often employed in hand-made terracotta, and we believe is designated as a "rough-tooled face,"

with and without the "random range" feature. Examples of it may be seen in the Great Northern Hotel building and also in the south half of the Monadnock Block, Chicago (the largest office building in the United States); but the design is bolder in these buildings, to match the larger size of blocks and structures. The light striking the surface of such blocks gives a very pleasing and varying effect.

The corner blocks and the courses below the window sill and above the foundations are tool-faced, and are shown of a different shade from the other blocks, which is desirable for the best effects.

One new block form not before found in our lists is included in this cottage, viz., a window casing block. An end view is given in connection with the window frame, the sash and the wood inside casings, as also the plaster course; and the relative position of the casing block to the adjoining wall block is also shown.

The porch of this cottage is also shown constructed of hollow blocks, the posts being sections of $8\frac{1}{4} \times 8\frac{1}{4}$ blocks of long length, and the rail being of the window casing blocks, with ribs scored off. The balusters are of 4×4 blocks.

Written for the CLAY-WORKER.

ENAMELED AND GLAZED BRICK.

S. GEYSBEEK.



HAVING JUST FINISHED reading the report of the building of a new railroad station in one of the European countries, I came across several things which took my attention, and there is one which I would present to the readers of the Clay-Worker. Enameled and glazed brick is the subject.

The building about which I was reading was a railroad station in one of the large cities of Europe, a great railway center. Traffic heavy, and consequently the finishing of the interior should look attractive and neat. It should easily be cleaned and always look as if new. The cleaning should not take long, for the traveling people were to be found there every hour of the day or night and every day in the year. Being such a large public meeting-place, it should first of all be healthy and clean. The solution of the question as to what to use for the walls and floors was not an easy one, and after several tests it was decided to use glazed bricks for the walls and vitrified tiles for the floors.

The contract was to be let to the lowest bidder, and many were the applications. Competition was great, and several factories with scarcely any knowledge of the glazed brick branch were among the bidders. The contract was awarded to just such a factory, which had little experience in that line. They bid just while they had nothing else to do, and they had little hope to get it anyhow. They had figured the cost lower than anybody else, because they had no experience, and now they really did not know how to get out of it. It was government work; they had to stand severe tests and furnish first-class work; such were the conditions.

The management of the concern, glad as they were that they did get the big job, felt a little uneasy about it, while they knew that they were not in a shape to furnish the materials as described in the contract, and that would do them great harm. But, on the other side, in case of success, they would be first in the country, for it was considered impossible to furnish materials at such a low price. After several conferences of the heads of the departments, it was the intention to withdraw on account of not being able to fulfill the conditions of the contract, when they concluded that they would try it anyhow, but that they should produce good goods at lowest cost. They had five weeks before they had to start running on the contract, and that was ample time to make experiments and tests in order to make first-class glazed bricks.

The factory got all the available assistance of chemists and

practical men, and, without regard to cost, in three weeks got results which proved to be the success of the firm, which was a short time before considered unknown in that line of the business. The bricks stood the government test better than any brick known so far, and color and appearance were excellent. The contract was filled two weeks before the time called for, and the factory is running on glazed brick altogether, and has a name known all over the country for its excellent material.

After having read these facts, several questions came up in my mind. First of all, why is there no more glazed brick made in this country, and why are there so many imported from the old country? Second, is it possible to make good glazed and enameled brick here, and why are they not made here? I think there is a demand for such article, for there were several occasions where terra cotta and tiles could be replaced by glazed and enameled bricks. I will not stop here to figure out the financial side of the question, but I will try to show the practical possibilities for making glazed brick on a sound base and on principles which certainly will not fail to give good results.

Clays and glazes are, as many writers have long ago pointed out, not such difficult things to deal with when they are applied in the proper way. This country supplies such a large number of clays that I feel certain that there would be clays found which would be suitable for glazed brick manufacturing. I want to say a word about and guard against the wrong idea that it is possible to make good glazed and enameled brick from any clay found in nature. From soft red brick up to vitrified paving blocks, there may be found some clays which would answer the purpose, but their amount is limited. Just as well as we cannot make from flower-pot clay porcelain, or from kaolin paving blocks, so we cannot make from every clay glazed or enameled bricks. The material is not suited for each other, and just so in the glazed brick business material must be selected to suit its manufacture.

To find such clays would certainly be not a very easy matter, but with the right assistance, chemical and technical advice, they could easier be found. Clays for such purpose should vitrify at a medium low heat, and should be light buff or white in color, so as to make it easier for the colored glazes to show themselves. The glazes should be made so that they do not show crazing or shivering, and body and glaze should be fitted for each other. The body should be nearly vitrified, so that the bricks could be used for outside purpose at the same time, and would not be affected by the weather, frost and other conditions. Of course, there are many difficulties to overcome in the making of a good enameled or glazed brick, but it is much easier to overcome these difficulties when the principles are built up on a sound base than when they present themselves in such a bad way that you will have to change completely everything in order to obtain good results.

I hope that brick manufacturers, and especially those who are making or want to make glazed bricks, would take a little time and think over what they expect when they come for advice, so as not to be disappointed when they do not receive by return mail the exact solution of their trouble and the remedy for it. Everything ought to have a substantial foundation; improvement is then light, but without that it is hardly possible to expect improvement without changing the thing from its very foundation.

Before I conclude this small article, I wish to call your attention to another fact, and which I think has much to do with the fact that the glazed brick manufacture of this country is so far behind other countries. We find all over the country people who sell glazes for so much apiece. They show you samples, and say that they have made them, and show you references and so on. Well, you like to try, and the results are that you buy from these fakirs, as we call them. After the man is gone you try and try, and never in your life you will be able to make a glaze out of it. Not because the recipe is not good—oh, no; that recipe will nine times out of ten be a good one, but only that you did not stop to think before you bought it. What is good in one place is not good in another place—that is

a sure rule. One glaze may just be fitted for one clay, and would not be fit for a hundred other clays. Then another thing—the temperature. Ask the man at what temperature his glaze will mature, and let him tell you in Seger cones, so that you can compare that with the heat you go to—if it is lower or higher. Then compare the formulas with the one you know, that a glaze will mature at a certain temperature, or otherwise find out, and get some advice first before you buy, and after all that you will be better able to judge if the glaze recipe is worth the money the man asks for.

I was once visiting a large stoneware factory in the State of Ohio. For ten weeks they had an Englishman working on white Bristol and transparent glazes. They paid him high salary. He never was able to make even something that looked like a glaze. He finally left, disgusted with himself. Well, the man was all right; his recipes were good glazes, but not for stoneware; there were soft lead glazes for faience; but the stoneware people were to blame for having supported the man so long, while they had not acquainted themselves with the conditions under which a glaze for their ware would mature and then compared it with the Englishman's.

The age of cut and try is gone; technical and practical advice has taken its place. The results are reliable, and are obtained much quicker. Progress and improvement are to be made when the right way is followed, and it is to be hoped that many manufacturers will make use of the facilities which are offered in that way to them.

WHAT IS ELECTRICITY?

THE QUESTION "What is electricity?" is answered by the American Electrician as follows: In spite of the all-round progress made during the last thirty years, we know no more about the essential nature of electricity than did Benjamin Franklin one hundred and fifty years ago. The several explanations offered, based upon the ether, or ether and matter associated, merely substitute one unknown for another. "After all, what is matter? What is the ether? How is matter associated with the ether? To such fundamental questions we can return no other answer than the now famous *ignoramus*. They make, or tend to make, us painfully conscious of the infinitude of our nescience." The writer of the review adds that Lord Kelvin must have been brooding over these provoking unknowns when he wrote to him in 1892, "Tell me what electricity is, and I'll tell you all the rest." This inability to detect electricity in its primordial form need, however, exert no distrustful, no depressing effects on the mind of the student of physical science. "Let him remember that a ray of light is an unexplained phenomenon; yet what wonderful truths are revealed to Fresnel, what knowledge has been wrested from it by means of the spectroscope, and what marvels is it not every day recording on photographic plates! If he feels himself morosely affected by this agnosticism, let him recall the astronomical phenomena which are accurately calculated years in advance without any knowledge whatever of the nature of gravitation; or let him think of that masterly bit of analysis which led to the discovery of argon without any knowledge on the part of Lord Raleigh or Prof. Ramsay of what chemical affinity is. If he is a practical man, let him reflect that the engineer lives amid stresses and strains, and though ignoring the intimate nature of the forces which he uses, builds up powerful engines and dynamos, and as successfully tunnels a Mount Ceniz as he throws a bridge across the Hudson or the Firth of Forth."

A NEW PROCESS.

Two gentlemen, who claim to have a process for making vitrified bricks out of the ordinary brick clay found in that section, were in Chester, Pa., a few days ago. They baste the bricks with steam, just as a careful cook bastes her turkey, while it is baking. It is said that the result is a brick of great hardness and durability. —Exchange.



THE EASTERN PAVING BRICK COMPANY.

THE WORKS of this company are located at Catskill, N. Y., on the Catskill creek, which empties into the Hudson river about 800 feet below us. I presume you are somewhat familiar with our town, which is to-day, they claim, about the same as it was fifty years ago, except for our works. It is more of a summer resort than a manufacturing town. It claims about 6,000 people steady, and in the summer there are about 40,000 here and in the mountains near by. It is very picturesque, and is well worth the trouble and expense for anyone to take the trip from New York up the Hudson river by daylight and the train from Catskill Point, and Otis elevator to the top of the mountains, which are from 3,000 and 4,000 feet high

home, they want to know what you want to pave the streets for—they are all right; so here we are, with the finest scenery in the world but poor roads and streets—extremely so. When in conversation about Catskill, just tell them what you have heard about the scenery, which I am unable to describe to you as it should be, so will go on to something more familiar.

—The Brick Works.—

Our shale bank is located at the foot of the mountains at a town called Cairo, about ten miles from the works, and connected by the Catskill Mountain railroad. We have thirty railroad cars that we keep in operation between the shale bank and clay bank and works. Our shale is very hard, in fact the hardest I have ever seen made into pavers. It requires steam drills to drill it for blasting purposes, and then it is loaded on the cars with a Bucyrus steam shovel. All the material I have seen along the Hudson river seems to be more of a low-grade ore than shale, but, with a mixture of clay, makes an elegant brick. Our clay bank is five miles nearer the works than our shale bank and on the same railroad. There is so little plasticity in the shale that we use some clay to help make a bond. Our clay is similar to that used on the North river, and will of itself vitrify, but would not stand up and keep straight if kiln was filled with brick made of it, and also burns very brittle when vitrified by itself, so much so as to be useless for a paver.

At the works we have a very good arrangement for unloading the material on the platform in the shape of a trestlework, and the cars are switched up onto this and are dumped from the bottom. On our material platform we have conveyors that



WATER FRONT OF THE EASTERN PAVING BRICK CO'S WORKS.

or above sea level. This may not seem very high when compared with some of our mountains, but it seems to me they are just high enough to see what is below more clearly. It is claimed you can see 8,000 square miles. Let this be as it may, I venture to say you will agree with me, when you have taken this trip, that it was like building a continuous kiln—well-spent money, and that you will take great pleasure from it. I will remind you, so you won't be disappointed, that when you reach Catskill you are getting very close to Sleepy Hollow, which is so closely connected to the story of old Rip Van Winkle. We have still the old toll-gate, and you have to pay, too.

Our streets are not yet paved with brick, nor do they seem to care much about it. One reason, I think, for this is that our people here only come here in the summer season, when the roads are good, and in the winter go to Florida or California. They don't have to go through the mud at all, and when the matter is brought up before the town board when they get

go to each of our eight pans, and these all being covered in, we can work in wet weather without any difficulty. The material goes from the pans to stationary screens, and from there to the pug mills. We have two pug mills and two brick machines, eight represses, and a nice arrangement for carrying back all waste material to the machine again. We develop 600 horsepower from two engines, one a Corliss 350 horse-power, the other, with an automatic governor, high-speed engine, 250 horsepower, and four boilers. Our dryer is a steam tunnel one, with twenty-four tracks.

All our machinery, including engines and boilers, were put in by J. W. Penfield & Son, now the American Clayworking Manufacturing Company. We have ten down-draft square kilns of the Eudaly type, and a three-fire continuous kiln, my system. Our burns have been very good in both kilns. When you hear some one say that a continuous kiln won't burn paving brick, ask them to come to Catskill. All that have taken

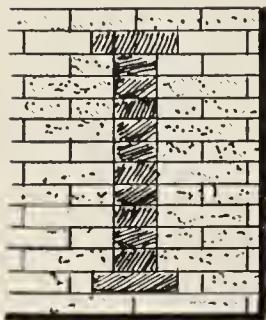
the trouble to come and see this kiln have been agreeably surprised to see the work done by it.

We had a very fair season in '97, and expect '98 to be better, as business is improving in our section. H. HAIGH.

HINTS ON BRICKMAKING.

BY R. B. MORRISON.

Some Things to Consider Before Investing in a Brick Manufacturing Plant.



IS THERE A MARKET for the product?

First, the local demand should be considered. If possible, put your plant where the local demand will require at least 25 per cent. of your output, as there is always better profit realized on brick sold at home, for the reason that when you ship brick the freight charges are an important item to the buyer, and the seller usually has to donate part of the profits to help pay freight. Then determine as nearly as you may the volume of your shipping trade, considering carefully the prob-

materials mentioned to a fineness sufficient to make good brick, either by plastic or semi-dry process. In the markets of to-day we are not confined to the conventional red, as we were years ago, but can sell any shade of red, buff, gray, white or black. Especially is this true of common building brick, for the walls are now nearly all faced with repressed or semi-dry press brick.

Because of these conditions and improved machinery for reducing and tempering clays, the brickmaker is not confined to soft clay, but can utilize almost any material on the earth's surface, except limestone and sand. There has been much talk and some attempts to make brick from sand, but so far as I know anything about it there has been little, if anything, accomplished by the "sandy" brickmaker. There are few localities in this country in which there is no material for the manufacture of brick.

Twenty years ago the brickmaker had to use only strong, tenacious clay to make a good brick, and burn it without great loss in drying and burning; now he can use a much weaker clay, that is, with a larger per cent. of silica than before, and still turn out good brick, with little loss in the process of manufacture. There are now improved methods of drying by natural as well as artificial heat, by which he can dry tender clay without checking and breaking, simply by controlling the rapidity of the process and by bathing the brick in a warm atmosphere.



INTERIOR VIEW OF THE EASTERN PAVING BRICK CO'S CONTINUOUS KILN.—See Page 321.

abilities and possibilities of this part of the business. Freight rates to important points should be secured over railroad lines. Find cost of labor, skilled and unskilled; cost per ton of coke and coal, and wood per cord at the plant.

If, after careful investigation, it is decided that the demand is sufficient to justify investing in a brick plant, the next move is to determine whether or not there is a bed of clay of sufficient quantity and proper quality within reach of a railroad line and local markets, situated above high water, and yet within reach of an adequate water supply for the plant. Selection of clay is now the all-important matter to consider.

Twenty years ago the brickmaker was confined to the use of clay free from any hard substance, and a clay that would burn red, and that could be ground and tempered by the simple pugging process. Now we have more latitude in selection of clays. Should we not be able to find soft alluvial clays in the valleys or lowlands, we can go to the higher levels, or even to the hills, and appropriate for our purpose decomposed rocks or shale. In fact, we can make brick from the products of the rock quarry—slate, soapstone, or even gravelly clay. We can now secure machinery that will readily reduce any of the ma-

so that the drying and shrinking is equally distributed over the entire surface of the brick.

In the burning the same improvements obtain as in the molding and drying. By improved methods the brick in the kiln are protected from sudden changes of temperature, preventing checking and breaking. The heat is also applied gradually. When the heat reaches the proper temperature it is maintained by a constant supply, keeping the ware at a steady, uniform heat, while by the old method fuel was placed in quantities directly under the bricks. This subjected them to sudden and intense heat, melting those near the fuel, destroying or damaging all the arch bricks.

These facts make it necessary for the writer on clay manufacturing of fifteen or twenty years ago to revise his articles so far as this phase of the subject is concerned. The demand for colors in clay, together with improved methods of preparing, molding, drying and burning, gives the searcher for brick material a much wider field than formerly, and also a much better prospect of success. Where a prospector has choice of different sites and material, he should choose the best.

Where good, strong clay, either yellow, gray, blue or brown,

clear of sand, gravel or rocks, can be secured, this is preferable to rough clay, shale or other material, as it requires less machinery, power and labor to handle and prepare for molding. This is especially preferable where only common building brick are to be made, and usually is this the case with face brick. This quality of clay is better understood by the average brick-maker, and with it the experimental stage of manufacture is passed much sooner than with clay that is less familiar to the craft. When this material is not available, either of the others will answer. In determining this question of clay, the prospector, unless he is a practical clay manufacturer of wide experience, had best call to his assistance a practical man, and in addition the advice of a scientific clay analysis.

Right here arises the question to be settled. Who is a good practical brickmaker? Not everyone that sayeth "mud, mud," is a brickmaker, but him that hath a record of practical success behind him. This is the only absolute test of excellence known to the writer. By his fruits you must judge him. When it comes to a practical test of clay, send a quantity to some brick-maker in whom you have confidence; have it prepared, molded, dried and burned, noting its behavior in drying, amount of shrinkage and effect on its surface. The same rule should be followed in burning. These actual tests are worth more than a

SOLUTION OF THE LABOR PROBLEM.*



WHEN A MAN resolves to build himself a house, he burdens his mind with various matters pertaining to it—the site, the size, the material, the design, etc.; but the first practical consideration that confronts him is the foundation on which it is to stand. The same or similar considerations con-

front us when we determine the solution of any political, theological or scientific question; the stability of the structure depends on the solidity and soundness of the base or foundation.

It is generally conceded that labor problems can only be accurately solved by true and just reasoning; that is, all the argument must stand on a firm base of truth and justice, and not on a basis of facts as we find them; hence I take exception to the solution of the labor problem as set forth in the last August Clay-Worker, promulgated by my octogenarian friend and Brother Randall, which, if carried to its legitimate end, would result in the extermination of our species. I grant nearly all that has been said about the inroads made by machinery into the rank and file of labor, and that said machinery has caused an excess of unemployed in every branch of business where it



EAST END OF THE EASTERN PAVING BRICK PLANT—STACK OF CONTINUOUS KILN IN THE DISTANCE. See page 321.

book full of theory or even advice. In another article we will follow up this subject of starting a new plant.

[To be continued.]

GOOD TIDINGS FROM CANADA.

Publishers Clay-Worker:

Enclosed please find postoffice order for \$2 to pay for Clay-Worker for another year.

My output for the last year or two has been curtailed to a great extent and as a result I will probably have no brick left to commence the season in May, 1898. The other yard here, while turning out about the same quantity, has all this season's make on hand and some of the season before. Times are certainly improving here, although we did not feel the hard times nearly so much in Canada as you did in the United States, and I do not know of any place in our own country that they held so good as in the Ottawa valley. I started a tile yard this summer. The demand so far has been very limited, but there are large quantities needed, and I am in hopes that the farmers will awaken to the idea that they must have them.

WM. TAYLOR.

has been adopted, and entailed on the laborer miserably low wages, short time, and consequent starvation.

I have always championed labor-saving machinery, and see no reason as yet for changing my views, for I always contend that the true and just province of machinery is the amelioration of mankind, not to reduce it to serfdom, want, and an early grave; and when mankind get their just share of the advantages machinery confers, they will hail with delight every useful machine that is built.

Why do compositors eye with suspicion the type-setting machine? Why are the glass-blowers so perturbed over the patent blowing machine? And why do painters stand aghast and dumbfounded when they see a spraying machine paint a thirty-four-foot box car in twenty-four minutes? Simply because they know that under existing conditions they will have no share in the benefits of this machinery which has been adopted at their expense.

When such wholesale displacements of hand labor occur, the

*To thoroughly understand the drift of this article it will be necessary to refer to the editorials in this magazine for August, 1897.—W. W.

question naturally arises, What will become of these toilers? My octogenarian friend and Brother R. reply, "If you can't get coal mining or anything else in your 'profession,' do something not in that line, and if you can't get a dollar and a half, take a quarter." Heaven forbid, say I. "When that old ex-slave's theory permeates the whole industrial system, the labor question will be solved." Yes, my dear friends, I really think it will, and settled, too; for when it comes to that, it will not be a question of wages at all, but ownership of the individual.

—What Are We to Do About It?—

Yes, that is the question. The object-lesson cited by my old

ners, etc., and they are decidedly worse off than brickyard hands, pottery hands, etc. Their condition is worse than yours and mine, and our pity alone will not help them much.

I sometimes muse over this great and glorious land of ours, of its possibilities, and advantages over the land of my birth, and I wonder how it is, and why it is, that we can export such immense quantities of bread, butter, cheese, bacon, beef, etc., etc., and still have thousands of willing workers starving for want of those very goods; and I muse and reflect on the beautiful machinery we have for the production of everything we need, both for comfort and pleasure, and I feel a genuine

thrill of satisfaction when I compare the industrial and social conditions of to-day with those of my younger days. I have seen many ameliorative measures adopted in my short time, and I hope to see a few more yet. I am perhaps a little more sanguine than my old friend who solves the labor question with a "take-what-I-choose-to-give-you-and-be-satisfied" rule, while my rule would be, Keep the distributing machinery abreast with the producing machinery. Let each one have his just share in every improvement. Then will the stigma of "misery-breeder"—so unjustly attached to labor-saving machines—fall off, and the negro who is "worth a dollar and a half a day in any man's garden" will get it. Call it "Utopian" if you choose, but is it anything more than simple justice? In anticipation of being called crank, visionary, and other little nicknames so freely hurled at people who are not quite satisfied with existing conditions, and who occasionally raise their small voice in protest, I cannot find any-

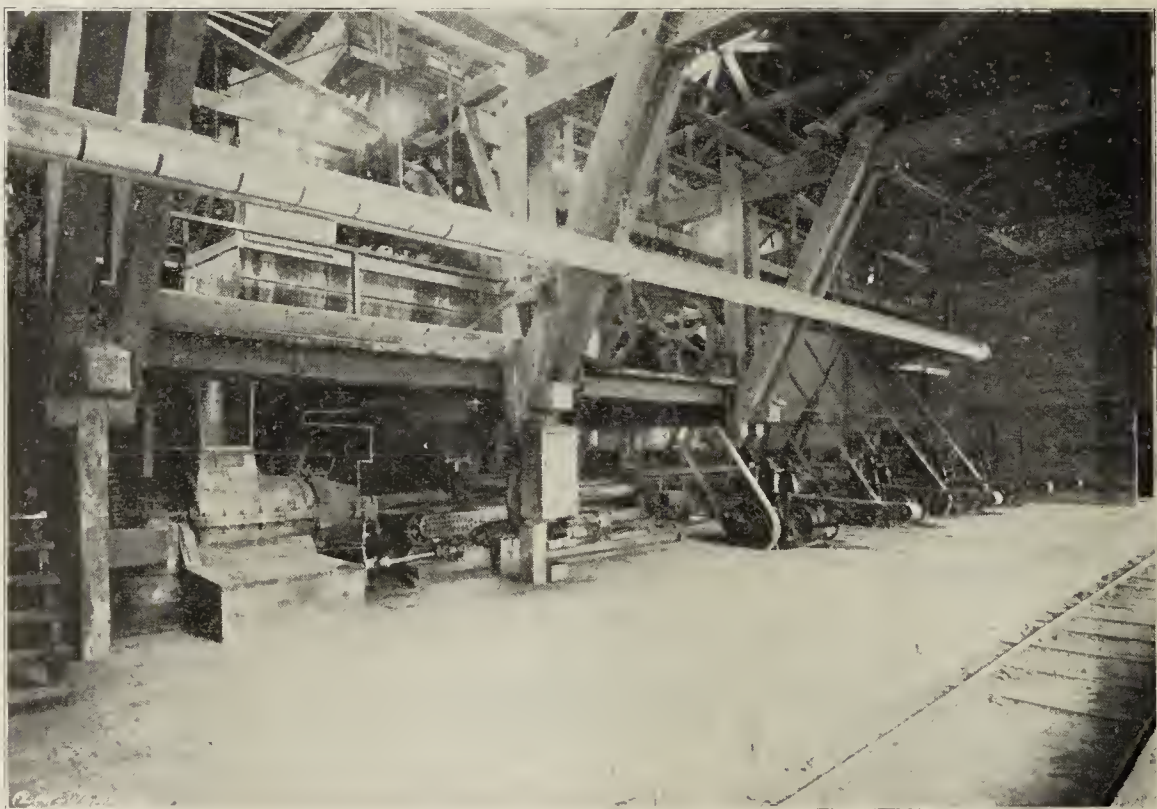


END VIEW OF CONTINUOUS KILN.

friend will not dovetail into the conditions of to-day; besides, I really see nothing commendable in that poor ex-slave's conduct, except his frugality and zeal to own a house and have money in the bank to fall back on. His methods of getting wages are decidedly pernicious to his fellow-workers, and nothing short of robbery to himself; in other words, he was a very easy victim for his employers. No, he does not come up to my standard of a good, manly negro; he is too ready to cringe and crawl. However, if we place him in the ranks with some I know to-day, it would puzzle him to know where even his quarter was to come from. My old friend bears me out in this in

—Good-Bye, Dobbin.—

He says: "The miners are to be pitied, but is their condition worse than that of other people? Labor-saving machinery has diminished the demand for manual labor in every industry known among civilized people." Very true, my old friend, very true. Now then, let us examine the remedy you offer above. "If you can't get coal mining or anything else in your 'profession,' do something not in that line." With a surplus of labor in every industry known among civilized people, the miner would be glad to have some specific line named in which he could find something to do. Now, as to the condition of miners, I would risk an assertion that their condition is much worse than that of nearly every other class of operatives, barring the sweat-shops, etc. They are much worse off than puddlers, heaters, rollers, and ironworkers generally; they are worse off than weavers, carders, wool-sorters, combers, spin-



THE MACHINE HOUSE AS SEEN FROM ENGINE ROOM. See page 321.

thing better than the words of one of my teachers to say in reply:

"Few have more moderate expectations than myself of universal rectification. Utopianism is not my idiosyncrasy. But I have confidence in endeavor. Continuity of ameliorative effort is the sole enthusiasm that can serve the cause of sociotarian improvement. It is useful to do what seems to be useful, whether little or much. This is my sole creed of duty."

—The Attainable.—

As I said above, I am delighted when I look back at the im-

provements made from time to time both in the industrial and social world, and while I am ready to acknowledge very much improved discipline in our common schools, I cannot see the same proportional advance in school books. While the school grammar is somewhat modified, I fail to see where it is much simplified. In "Higher Lessons in English," a school book published in 1884, I find my old "nominative" replaced by "subject," thus: "The verb must agree with its subject in number and person;" still I find my old nominative retained, i. e., "Nouns have two case-forms, the simple form, common to the nominative and the objective case, and the possessive form." As yet I have no nearer up-to-date grammar.

I memorized a good portion of Lindley Murray's grammar while at school, but it was William Cobbett who taught me all the grammar I ever really knew, after my school days were over; he objects to nominative, or did so eighty years ago. He says, "It is bad; it is inadequate to its intended purpose; but it is used, and if we understand its meaning, or, rather, what it is designed to mean, its intrinsic insufficiency is of no consequence." I am a little away from the question, but perhaps not much either, for I want to enter my protest against books called grammars being written in such uncommon and incomprehensible language I see in the modern grammar mentioned above ("Higher Lessons in English"). I copied the following list from one page. Fancy this array confronting a child. They are different forms of the verb: Regular, irregular, redundant and defective; transitive, intransitive; predicate, participles, infinitives; active, passive; indicative, potential, subjunctive, imperative. Now the next three are within the scope of a child's intelligence and understanding—present, past, future—being the common everyday language the child hears at home; but when you begin hampering its little mind with present perfect, past perfect and future perfect, it fills it with despair; at least it did me. You may tell me that all those perplexing terms are nicely explained in the definitions. Yes, I know they are; I used to turn back to the definitions, and I found: "The potential mode asserts the power, liberty, possibility, or necessity of acting or being." How easy! how very simple such a definition makes the potential mode of a verb! The great desideratum of the common schools is, I think, a grammar that the scholars can understand—that is, written in fireside language. That will, at least, make grammar more attainable. I am glad Brother Randall gave me an opening for my protest. I quite agree with him as to the firm basis of fundamental truths. We shall never differ about truth; if we do, it will only be evidence that one of us has taken wrong aim. Truth remains where it was; if we miss it, the fault remains with us.

—The Inevitable Relation of Supply and Demand.—

I am not aware of anyone who disputes this relation, nor of few who are not aware that demand may be made to fluctuate, sometimes naturally, at other times artificially. A recent instance is the excessive foreign demand for wheat, due to natural causes, of course, and the abundant crops in this country, due to same causes, have enabled wheat dealers to realize a dollar a bushel on it; in other words, our good fortune, or rather the good fortune of wheat-grower and dealer in our country, hinges entirely on the misfortune of others, not only the growers and dealers of the famine-stricken countries, but the whole populace; whereas, had their crops been even normal, our wheat would now be begging at much less than fifty cents a bushel. We should have had wheat to burn, as we had corn, two or three years ago, or it may be more—I cannot just now recall the period; it would still be due to natural causes.

For a case of artificial interference, let us suppose the Prohibition party in power. Their first step would be to prohibit the spoiling of so much corn, barley, rye, etc., in the manufacture of whisky. Where, then, would be the demand for these cereals? Yes, Brother Randall, human enactments do, and always will, affect prices of labor, or why are bricklayers re-

ceiving 45 cents an hour, and why are amalgamated puddlers receiving \$4 or \$4.50 per ton, while non-union puddlers are receiving only \$2.50 per ton? Is there any dearth of puddlers or of bricklayers? Every year since 1881, to my knowledge, there have been attempts to burst the dam or artificial obstruction raised by the Amalgamated Association of Iron and Steel Workers, and every year the bricklayer has to strengthen his union dam against the pressure brought to bear on it by building operators. Had the people of Johnstown listened to the frequent warnings about the insecurity of the dam in the valley above them, they might have made it secure against the force of gravitation for all time, practically, but not against the law of gravity. This Johnstown dam simile suits my purpose very well. Select good material and sufficient of it; then build it carefully, making due allowance for every strain that may be put on it, and you are masters of the situation; you hold a large body of water in check which you may use for power or other purposes if need be; in short, you have stored up an immense power or energy, which, if used discreetly, will greatly assist in improving your social condition.

Perhaps I am getting old and rather stupid; nevertheless, I keep on demolishing the veneering of some of the "isms," and I am afraid that "adjusting themselves to the conditions" is not good solid timber, nor calculated to regain prosperity. I know nothing of the cheap dogma about the duty of government to create demands of any kind, but a government of the people, for the people and by the people cannot fail to give everyone their just share of what it produces. Any administration not founded on simple justice is not a good administration, no matter what it may be named, nor by whom it may be framed. Let us have more justice, and we shall need less charity.

No, I cannot accept the creed of adjusting myself to distasteful conditions, nor to any fixed conditions, nor does Brother Randall; his life's work is to improve his own and his fellow-clayworkers' conditions; his daily practice confutes such a creed. If I, by a dissolute course of life, bring on myself adverse conditions, common sense would teach me to reform my life in order to improve them; if my brother is the cause of such conditions, the same common sense would prompt me to reform my brother, or at any rate to attempt it. If I move to a district where malaria is prevalent, or where good crops are not prevalent, my course would be to move to a place where nature was more disposed to favor the conditions desired by me, and so on right along. The mariner stranded on a desolate isle will undoubtedly try the adjustment plan, but will most assuredly keep on the lookout for a vessel to take him away from his conditions there. Of course, there is some plausibility in such a doctrine, but it is best suited for a community where meekness and humility are the dominant factors, and not to sharp, progressive Americans.

In conclusion, I would just say that during the eighteen years I have lived in this country I have never seen one disastrous year yet—that is, for the country. I have seen much disaster and ruin for individuals, but what does that mean in general?—only leaving one pocket for another. Speculating in dollar wheat caused the failure of a firm of stock-brokers in New York the other day, with the loss of over a million dollars, but we all know this was loss only to some individuals, and of course just that amount of gain to some others. When prosperity is carried on the wings of speculation (gambling), the flight will be short and the fall serious, but when fostered by a healthy natural demand, then, and only then, will it be permanent. An administration by and for the people will see that everyone gets his or her just share of prosperity. It is unjust conditions that require adjusting—an adjustment of conditions that are increasingly making continued prosperity partial and fluctuating. To my sanguine mind, to regain prosperity in a country like this is not a difficult problem. To solve it, banish dishonesty, and let justice reign.

W. WAPLINGTON.

Written for the CLAY-WORKER.

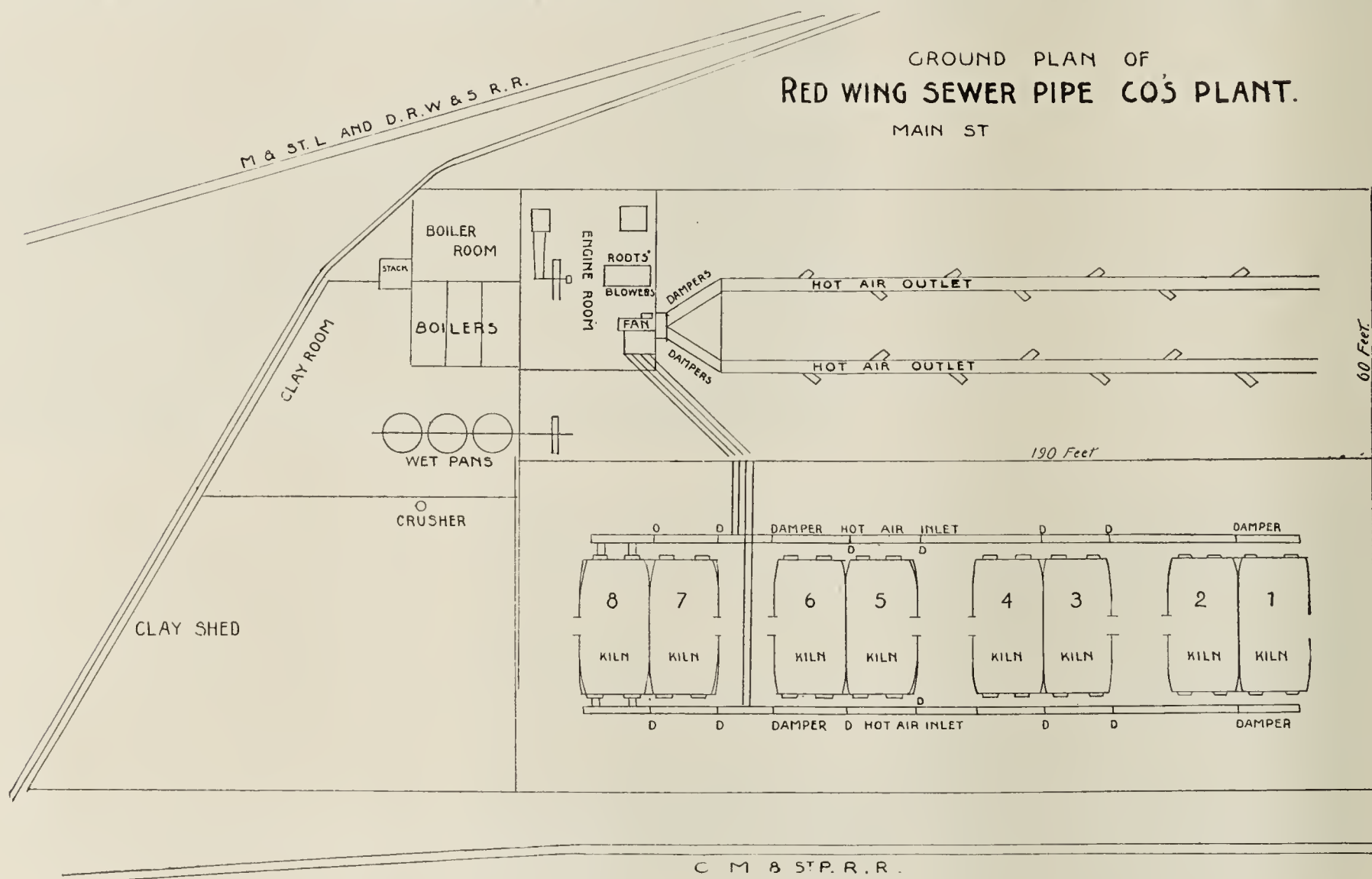
MINNESOTA'S PIONEER SEWER-PIPE FACTORY.

THE RED WING sewer-pipe shop is the pioneer sewer-pipe shop in Minnesota, and commenced operations about six years ago. The shop is built of brick, three stories in height, 190 feet long and 60 feet wide. The plant is well equipped with the latest machinery for making sewer pipe, and consists in part of three 100-horse-power boilers, a 150-horse-power Buckeye engine, three wet pans and a Vaughn press. There are eight square down-draft kilns, and oil is used for burning and is proving very successful, producing an excellent quality of pipe. The oil plant was installed by the National Supply Company, of Chicago, and consists of a double set of oil pumps with receiver, and a No. 3 Roots pressure blower, which furnishes the air for atomizing the oil. The oil has proved very advantageous over coal in the saving of time required for burning a kiln, the time now required for burning a kiln being from forty-five to sixty hours (depending on the size

floor) to the different floors by means of trucks of various kinds, according to the sizes of pipe. All three of the floors are used for drying. The pipe are raised and lowered from one floor to another by means of two elevators. The time required for drying varies with the size of pipe; 4-inch pipe can be dried in twenty hours, while 24-inch pipe requires one hundred hours or more to dry safely.

The heat is conducted from the cooling kilns to the fan in two separate flues extending the whole length of the kilns, one on each head near the fire-holes and about two feet under ground, connection being made separately with each kiln out of the fire-holes by means of galvanized iron elbows which fit into openings on top of the hot-air flues. These elbows are movable and are put in place only when heat is being drawn from kiln. The hot-air tunnels or flues are all constructed of sewer pipe, the inlets consisting of 20-inch pipe and the outlets of 24-inch pipe. "Y" branches are used on the outlets about fifteen feet apart to distribute the heat evenly underneath the floor.

The size of kilns inside of bag walls is 13x20 feet, side wall



of pipe), as compared with sixty-five and eighty-five hours when coal was used. Eight and nine kilns a week alternately is the output at present. The month of December was a record-breaker, when forty kilns were burned.

The drying of pipe on the floors is done by exhaust steam during the daytime, and at night hot air is drawn from the kilns (after the burning is finished) through a hot-air tunnel by means of a Sturtevant fan, which distributes the air under the lower floor.

The clay is obtained about twelve miles distant on the line of the Duluth, Red Wing & Southern railroad, and is of excellent quality; requires no crushing, only tempering in the wet pans. The company owns eighty acres of land at the clay bank. The clay deposit is quite extensive, extending from two or three feet below the surface to a depth of forty feet. The digging is done by hand with pick and shovel. The clay being tough and plastic, it is doubtful if a steam shovel could be used. It is loaded on flat cars and brought to the plant over the Duluth, Red Wing & Southern railroad.

The pipes are conveyed from the press (which is on second

8 feet high, with 5½ feet spring for crown. The pipe are set four and five high for 2-foot lengths and in nests—that is, with smaller ones inside the larger. Take a 24-inch pipe for instance; inside a 24-inch a 15-inch; inside a 15-inch an 8-inch; inside an 8-inch a 3-inch. This makes what is called a stand of pipe.

Have very little trouble from cracking, either in drying or burning. Watersmoking usually takes from ten to twelve hours. Pipe are usually stored on yard; occasionally in filling orders during the busy season they are hauled from the kilns to the cars. A Gates crusher is used for crushing grog, which is mixed with clay for larger sizes of pipe.

The oil is stored in two underground tanks capable of holding 10,000 gallons each. There is no saving in cost of oil over coal; the saving is in point of time, and oil can be burned without any smoke—a desirable item inside the city limits.

The company has very good shipping facilities over three different roads, viz., the Chicago, Milwaukee & St. Paul, the Chicago & Northwestern and the Minneapolis & St. Louis railroads.

The company employs about forty-five hands, and has been running steadily all winter, getting a large stock of pipe ready for the coming season's trade.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

ONE HARD THING to learn, Gates, seems to be to live our lives one day at a time. We put off the little, pesky, annoying duties of to-day as too small and insignificant to command our attention, and leave them undone, longing all the while for the time when, honored and respected, we shall do great things, perform vast labors, and win and retain great renown.

"We forget that the Great Emancipator measured calico and molasses, honestly and diligently, for years before he spoke the words and performed the works that make him live in history. We forget that the Father of his Country patiently measured the ground to settle petty disputes as a country surveyor long years before he led his country to victory and independence. We forget that the Hero of Appomattox tanned hides, and tanned them well, and that even when the time of crisis was come and there was need for him in his greater sphere, when put to menial clerical drudgery he did the work, and he did his duty just as well as in later times, when he had gathered in his hands the lives of a great army and the destiny of the noblest nation on earth. We forget that the Savior of Mankind was a dutiful son and a good carpenter for long years before His work of redemption began.

"All these we are prone to forget, and, casting off any idea of doing the little insignificant duty of the hour as well as if it were great and important—of doing it as well as we know it ought to be done—we long for the day when we shall have great and honorable works to perform, noble things to achieve. We worry and fret. We quarrel with the petty duty of to-day and long for the great work of the future. We disregard the humble joys of the present and worry as to those to come. Not content to trust God with His own universe, we helplessly worry and fret about affairs we cannot and never could control, and stretch our petty energies and strain our minds as to matters we cannot control, and thus neglect and lose all we might gain from doing our daily duties a day at a time as we go along.

"The builder builds the sky-scraper a day at a time, and his work is complete and satisfactory. The farmer gets his crop by working a day at a time. The scholar attains his learning, not in bunches, but by labor a day at a time. You do your thinking a day at a time, Gates, I should judge it took you just about that long, and if you don't have to give change for it when you get paid, you may get a dollar a time.

"The reason we put these things off is because we think them too insignificant, too little, too mean. But the little things are at the same time the most annoying and the most common. They come the hottest and they come the thickest. There are more fleas than elephants in nature, and they cause more trouble. The very element of pesky littleness and meanness adds to the annoyance and causes us to rebel. Many a man who would walk miles to cast his vote for a President will neglect to notice an opportunity to bring in an armful of wood or a pail of water for a tired woman, but some one must bring them in just the same, and too often must she do it herself.

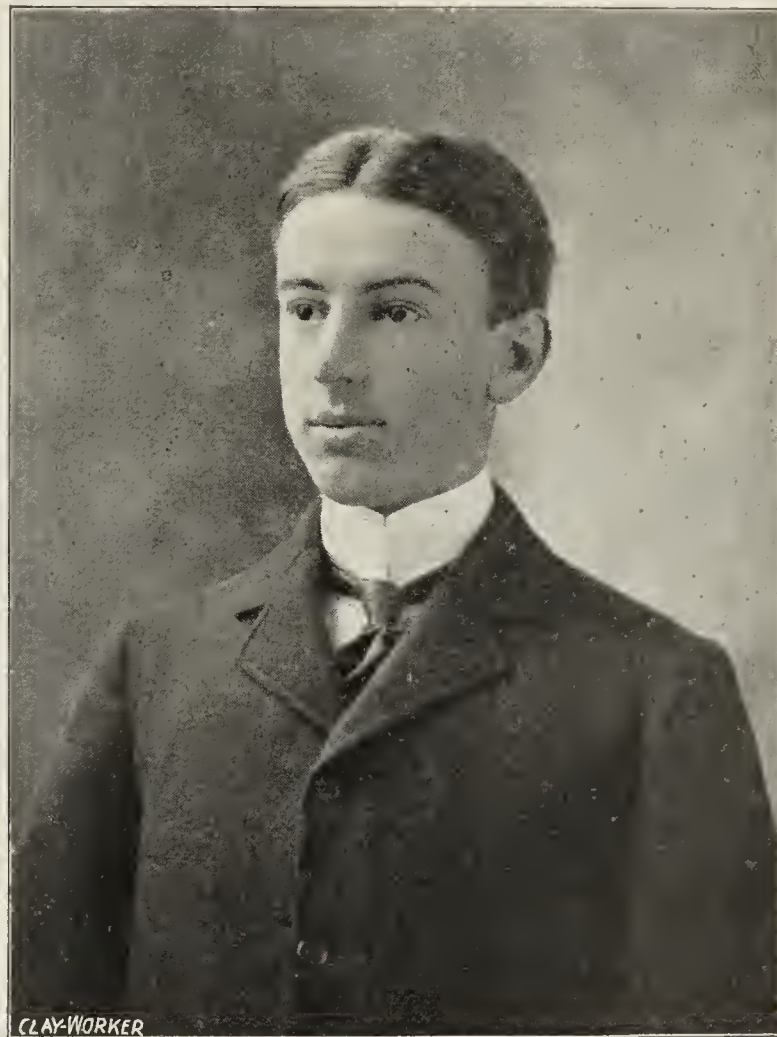
"The rearing of a child requires patient toil, care and self-denial, nursing and unremitting attention, but it brings a reward in a rich fruitage of love and devotion that are obtainable in no other way, and that are among the richest treasures and pleasures of life. Yet because these duties are petty and constantly recurring, many a mother throws them off upon a hired attendant, and thus loses all the love and devotion they win, and all the happy childish confidences of the innocent little prattler, and at the same time cheats the infant out of his birthright of a real mother. But the mother who strains her muscles and nerves caring for the infant, day after day, one day at a time, straining her energies, perchance, yet feeling that it is a sacred duty not alone, but a glorious privilege as well, comes at last to the glorious reward—to the joys of prat-

ling confidences; of clinging, loving arms; of warm, joyous, affectionate kisses; of a trusting love that is built up only and wrought out by those days and nights of self-denial and toil, and can be had in no other way. It cannot be bought and sold."

GATES.

A NEW BRICK EXCHANGE.

After a great deal of discussion, the brick manufacturers in the vicinity of New Britain, Conn., have formed a new exchange, which will take the place of the one organized some years ago, which will at once wind up its affairs and go out of existence. All of the manufacturers, including the Merwin Brick Company, Berlin Brick Company, Donnelly Brick Company, Tuttle Brick Company, Standard Brick Company, Holmes & Dennis, Richard Murray, W. L. Davis, Tower Bros. and Caleb Johnson, are stockholders in the new concern in proportion to the capacity of their several yards. Each yard is represented



E. CLIFFORD MERWIN, Secretary of the New Britain Brick Exchange

by a director, and the affairs of the company are managed by a President, General Manager and Executive Board. The officers of the new company are G. N. Dickerson, of the Standard Brick Company, President; E. Clifford Merwin, Secretary; Horace R. Payne, Treasurer and General Manager. The President, with W. L. Davis and M. E. Jacobs, form the Executive Board. The new company has a capital stock of \$7,500, and is to contract with its stockholders to purchase a stipulated amount of brick, which is the estimated capacity of the yard for the season, at a stipulated price. The exchange is to do all selling of brick and collecting of payments for the same, and orders are to be divided in proportion to capacity, with division of profits in the same ratio. The new Manager, Mr. Payne, who has for a number of years been book-keeper for the Merwin estate at Berlin, resides in Kensington, and will take hold at once. Mr. Payne is regarded as a very competent man by the brickmakers, and there is a feeling that the business outlook for the brickmakers is very much improved.

Persistent perseverance has achieved more success in advertising than all the originality, capital and so-called "luck" put together.

"UNION" BRICK MACHINES.

IT IS A WELL-KNOWN FACT that E. M. Freese & Co., of Galion, Ohio, have been manufacturing brick, tile and terra cotta machinery exclusively for many years, and their machinery is found in many of the best plants throughout the country. They have been the pioneers in many important improvements in clayworking machinery, among which are the "Union" or "Combined" Pug Mill Machines, one of which we illustrate. Although they designed these machines some years previous, they have been building them during the past four years, and a large number of them have been sold and are in successful use, the first ones still giving excellent satisfaction.

The increasing demand for these machines has led to others of similar appearance being recently placed upon the market by those whom our Galion friends think are not overburdened with conscientious scruples regarding the adoption of improvements developed at a cost of much labor and expense by others.

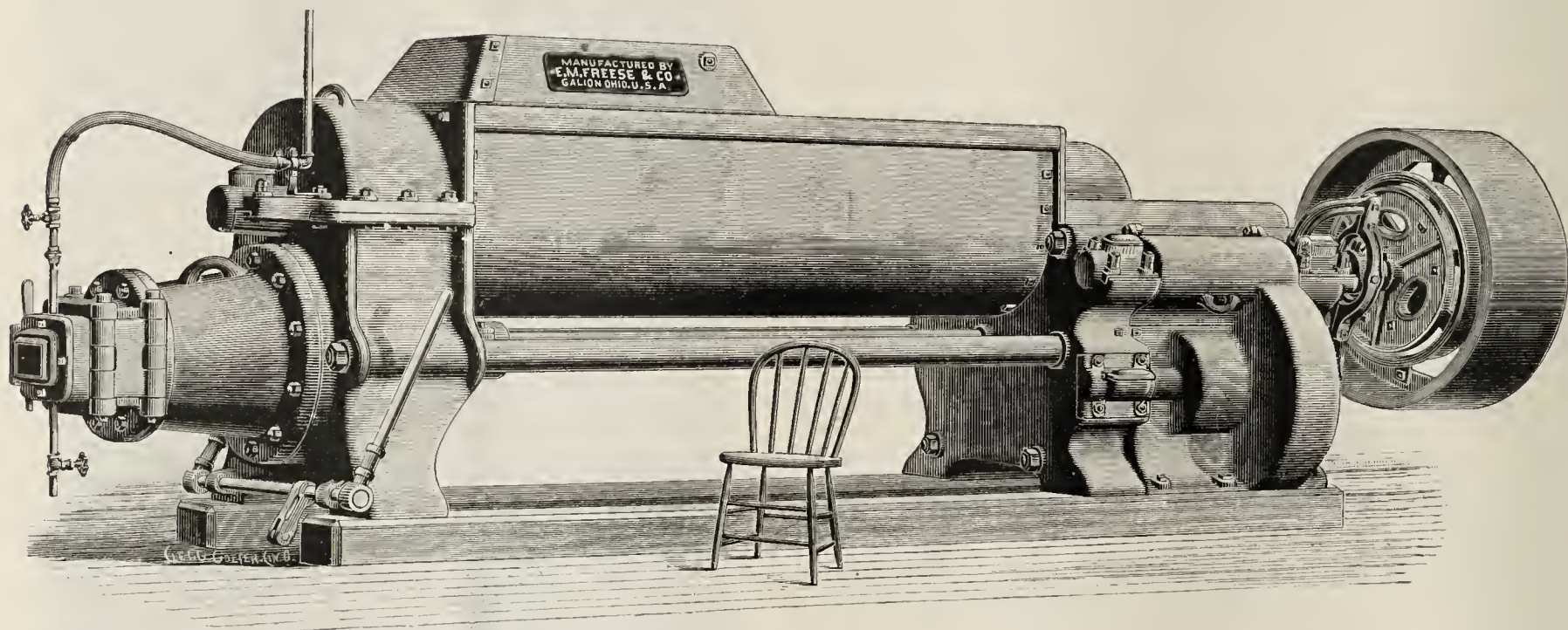
The machine illustrated represents one of a line comprising four sizes, suitable for all capacities from 15,000 brick daily to 80,000. They are made both direct and counter-gearred. The counter-gearred machine illustrated is of massive construction throughout. It is back-gearred fourteen to one. The gearing is made from accurately cut patterns and runs smoothly, although

smooth brick with perfect corners and of superior texture. The die is attached to a hinged front, which can be conveniently opened when desired, and which also is so arranged that it opens automatically in case the pressure should exceed the amount for which it is set, thus acting as a safety valve in case the clay should accidentally be fed into the machine too dry to be forced out of the die. The feed of the clay from the pug mill to the auger is positive, and clogging cannot occur. This is a very important point.

The peculiar design of these machines renders it possible to greatly simplify the construction, so that only about one-half as many parts or as much gearing is required as when the pug mill and auger brick machine are made separate in the usual manner, and the outfit is more compact and by far more convenient in operation. None of the advantages of separate machines have been sacrificed, but, on the other hand, many points of advantage have been gained. No separate pug mill is required.

Mechanically these machines are of high grade throughout, the material and workmanship being first class. Their parts are made to standard gauges, and can be readily duplicated in case of accident or wear.

The weight of the machine illustrated is upward of 20,000 pounds, and its daily capacity is from 50,000 to 80,000 brick. It



COMBINED BRICK MACHINE AND PUG MILL INTRODUCED BY E. M. FREESE & Co., Galion, Ohio.

the teeth of the gears are large and their faces are wide, giving the machine great driving strength and durability. The gearing is also closely covered by a substantial iron case, no sheet iron being used for this purpose. This covering is easily removable, so that the gearing is equally as accessible as in machines where no covering is used. In this way the gearing is protected from the destructive action of dust and grit or from the accidents liable to open gearing, and at the same time the operators are protected from danger.

Both the Pug Mill and Auger Machine are of their well-known standard construction, having the same general features as in their separate Pug Mills and Auger Brick Machines. The pugging knives are of forged steel hardened, and are conveniently renewable. The auger is made of a special material which is as hard as hardened steel, thus giving these parts, which are exposed to the action of the clay, great durability. All journal bearings are outside, and none are exposed to the clay, and are covered to exclude dust. The thrust bearing of the auger shaft is of the improved type which they have been using for some years with unexceptional satisfaction. All the usual annoyances from this bearing are entirely dispensed with. The machine is driven by an improved friction clutch pulley, which is conveniently controlled by a lever near the die. The die itself is of their improved lubricating type, which molds

is well adapted to the manufacture of either building, paving or fire brick, fire-proofing, terra cotta and hollow building blocks. Height of machine to top of pug mill, five feet four inches. Length, twenty-three feet.

CONFIDENCE AND PROSPERITY AGAIN DOING BUSINESS IN IOWA.

Publisher Clay-Worker:

Enclosed please find draft for \$2, subscription for the Clay-Worker for 1898. We are pleased to report the return of Confidence & Prosperity. This firm or combination located here again the first of the year, after an absence of about five years. They are the large consumers of brick as well as other building material. They buy freely and pay promptly. We closed down last December with about one million of brick on hand; said million is sold and delivered, and we have booked orders for another million and a half, with more in sight. The weather has been very favorable. We started our works February 24th and are turning out regularly 45,000 per day, and everything goes.

FORT DODGE (IOWA) CLAY WORKS.

WANT T RAILS AND DUMP CARS.

The Kentucky Fire Brick Works, Portsmouth, Ohio, desire to purchase about fifteen tons of twenty-pound T rails, second-hand, but in good condition, and splice bars. Also fifteen dump cars, with good brakes and 3,000 pounds capacity.



MURTHA & EARLY'S MOLDED BRICK.

AWAY OFF to the northern section of the city are several nice suburban places—Wayne Junction. Of course you have all heard of Anthony Wayne. If you haven't you ought to look up the history of the United States and of Pennsylvania, for it's right in Germantown, and of course you have all read of the battle of Germantown. Well, get off here and we'll walk down a block or two. As you listen to the suburban natives you are led to believe that they one and all recollect the lovable and respected George Washington, and if you become a resident there for an indefinite period you are led to believe that Concord and Germantown are the only two places where the blood of the British was poured out by the famous minute-men in order that the folks away out in Utah and San Francisco might have tea with tacks.

Within a stone's throw of Wayne Junction is Nicetown, and at Sixteenth and Butler streets is the plant of Murtha & Early, and a swell-looking plant it is, banked up on one side with a broad belt of green grass, its square stacks rising some eighty feet from the engine room and of an invidious terra cotta color, with the names of the owners painted white in letters eighteen inches in length rising perpendicularly, giving the entire place a standing advertisement. None of your low-down slushy places, where one needs gum boots and a scow to get to the drying tracks. No, this is a good high-up location, consisting of over forty acres, with the rear backing up to a broad road, and an abundance of good clay, with a fine top surface and a ten-foot vein of plastic clay.

Last year they drove the machines and kept men working



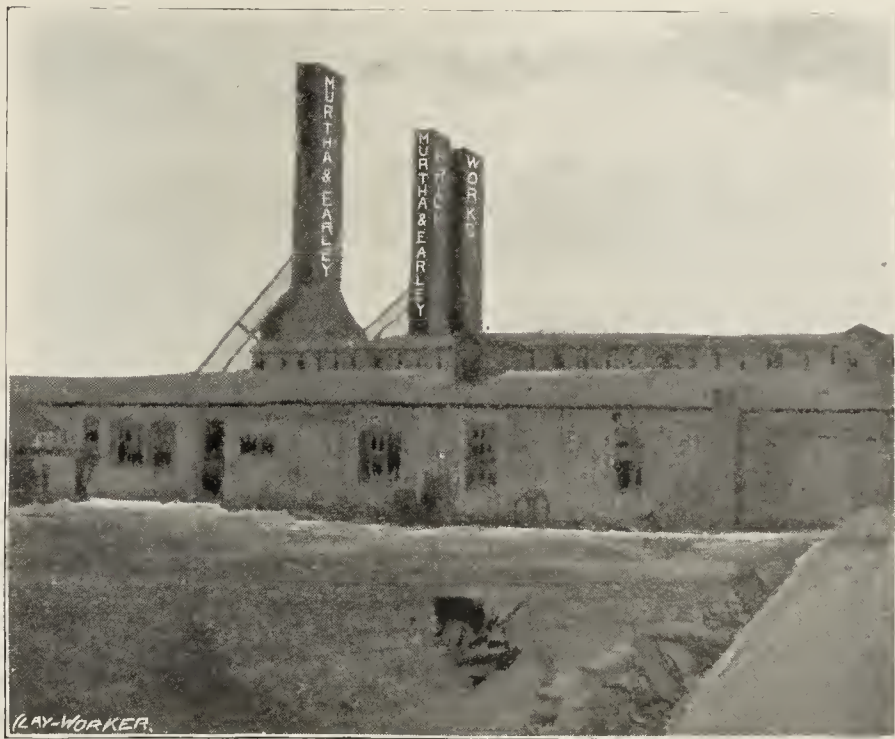
MURTHA & EARLY'S KILNS.

279 days, made 13,000,000 brick, and sold and delivered 16,000,000. This was due to their working 303 days in 1896 and having 5,000,000 left over; this made their order for '97 compara-

tively easy. This accounts also for the presence of Mr. Murtha at the Pittsburg Convention this year, his initial attendance, but not his last, I think.

The rule is "no let-up" if possible, and from 80 to 100 men are kept on the pay rolls. The layout of the yard is convenient and trim, with a good-sized office at the gate, consisting of three rooms. Stretching north and south is the line of the nine up and down-draft eleven-arch kilns, of 250,000 capacity each. East and west, and taking up the center section, are the drying sheds, a twenty-track dryer, and a well-lighted machine shed, with space enough to mobilize 5,000 men. In this they have one Penfield auger machine, one Penfield soft mud and one Martin machine. The clay is dumped on the rear and from there into the chute and pans, and then elevated onto the pug mill, where it is watered by a five-arm spray. From the Martin and the Penfield side-cut the tracks radiate, and the movement is almost automatic. The saggars set them up on the trucks, and the truck men immediately run them over the track and distribute them for drying.

As only molded, pressed and repressed stretchers are made here, an inspection of the grinding rooms was next in order.



MURTHA & EARLY'S DRYER AND STOCK SHEDS.

Here the three six-foot diameter grinders, each with Carnell iron plates, were fed by a 25-horse-power Erie engine, under the charge of the foreman and four men, who average daily about 500 straight cuts or arch trimmers, the more complicated half molds, turns, corbel heads taking more time. Molded Pompeian and red stretchers were being turned out to meet the requirements of architectural detail plans and scale drawings. The main engine and boiler room was furnished with a 250-horse-power engine and three boilers of 100 horse-power each.

Mr. Murtha expressed himself as being satisfied with the outlook for the coming year, and with an electric sparkle in his eye referred to his being at the Convention, where he had a "bully time." Did he? I guess! W. P. LOCKINGTON.

A COMBINATION SUBSCRIPTION.

George R. Barron, Red Wing, Minn., in remitting subscription to Clay-Worker, says: "This is a sort of combine between three employes of the Red Wing Sewer Pipe Company—the foreman, kiln-burner, and myself, the engineer. We were desirous of keeping posted concerning the clayworking industries, and could think of no better medium for that purpose than the Clay-Worker." This is an example worthy of being followed by other employes who do not like to borrow the Clay-Worker from the office.

Written for the CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN.—No. 2.



MUCH HAS BEEN SAID and written in our Conventions and journals on the subject of starting a brick factory. My ideas on this subject have, during the last five years, undergone not only a complete change, but many changes. But as I started out to give a faithful history of our own enterprise, with its many mistakes, failures and subsequent alterations, no one may expect to read here a description of an ideal plant. We have spent enough money in tearing down and rebuilding that which failed to answer our purposes to have made a model plant, complete in every detail. But when any factory is constructed without a plan, or by one who has no practical ideas of the demands, it can never be reconstructed to meet those demands in every particular. One may add something here and lop off a little there, but to conveniently arrange mill, dryer and kilns is then an impossibility. But slight inconveniences are not fatal to an enterprise where an intelligent effort is made at reconstruction. No man should become discouraged because of a few mistakes in the beginning, but let those about to begin learn wisdom from the mistakes of others.

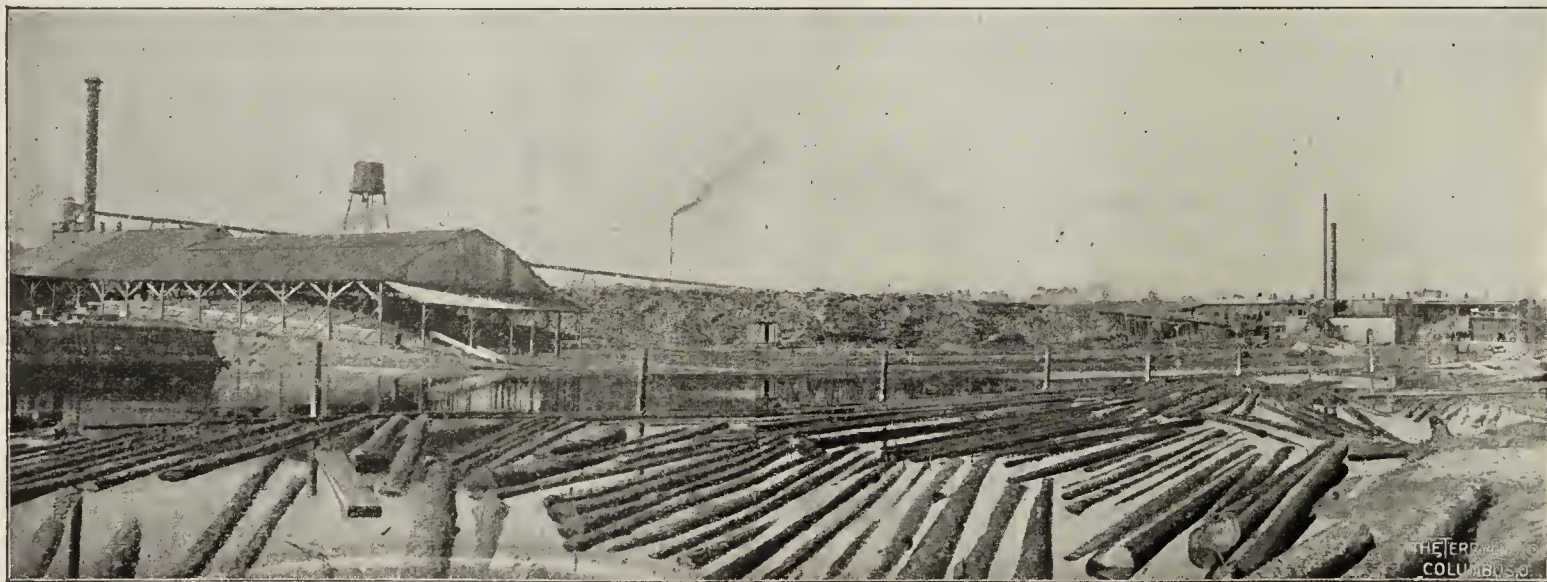
The originator of our enterprise was a good brickmaker by the hand-mold process, but, having used up all the clay available at his yard, decided to make a change, not only in location, but also in process. He said there was money in brickmaking—lots of it! He said he could make brick by hand for \$3 per thousand, and of course by machinery they ought to be produced at a much lower cost. Then there was always a ready sale for them at from \$6 to \$7 per thousand. That was just the snap I had been looking for. I had for years been selling dry goods at from 10 to 25 per cent. profit, and sometimes at a loss because of a very robust competition. And now, if the brick

make 20,000 brick per day, and to require an engine of 20 horsepower to run it. I want to say right here that that machine was all right, and could do its work with credit to its manufacturer. We purchased an engine and commenced work. Luckily for us, we bought an engine of 35 horse-power, for we soon found that, though the agent who sold us our brick machine had not overestimated its capacity, he had greatly underrated the amount of power necessary to run it. We needed all the power that engine could furnish, with steam at 75 pounds pressure. And right here I should like to digress long enough to give a word of advice to both seller and purchaser of brick machinery. To the seller I would say, don't overestimate the capacity of your mill. That is bad enough. But it is far worse to underestimate the amount of power to run it. Had we bought an engine as recommended by the agent for our mill, we would have been forced to purchase another boiler and engine before we could have made a brick. To the purchaser I would say, buy a brick machine of greater capacity than you need at the time, for the time may come, as it has with us, when you will need the larger machine. Then get you an engine and boiler with from 10 to 20 horse-power to spare, for you never know what you may want to hitch on as you learn more about your business and the demands of your customers.

[To be continued.]

JEFFREY STEEL CABLE CONVEYOR FOR SLABS AND REFUSE.

THE ACCOMPANYING illustration is a view of a Jeffrey Steel Cable Conveyor, 700 feet long, which carries the slabs and general mill refuse from the sawmill to the burner and dumping grounds at the plant of the Salmen Brick and Lumber Company, of Slidell, La. This conveyor is constructed of a special 718 steel wire cable 1,425 feet in length, having circular discs or conveying clamps bolted to the same



STEEL CABLE CONVEYOR AT THE SALMEN BRICK & LUMBER CO'S PLANT, Slidell, La.

trade was in such a healthy condition as to afford a profit of 100 per cent., it was the business in which to make a fortune. There was no doubt of success, for just look at the figures! Cost of manufacturing, \$2.50 per thousand; selling price at the kiln, \$6 per thousand; net profit, \$3.50 per thousand. We could make from three to five millions per year. That was a magnificent prospect to commence on, and "figures won't lie."

We selected a clay bank by guesswork, of course, more because it was convenient to the railroad and could be bought on time than that the clay was good for making brick. We decided to adopt the stiff mud process, with end-cut die and table. Of course a man who had spent ten years drying hand-mold brick on an open yard would naturally expect to continue the same process of drying. But for fear we could not run during wet weather, we built a small dry shed in which to hack the brick as they came from the mill and allow them to dry under shelter. We purchased an auger machine recommended to

at intervals. The cable operates around two sheaves, one at each end of the conveyor, the power being attached to the sheave at the mill or receiving end. The slabs are carried in a V-shaped trough, the bottom of which is lined with steel of special shape and design. This reduces the friction and wear, as well as the power for operating the conveyor, to a minimum. The conveyor in question has been in successful operation for some time, and has fully demonstrated the fact that this work could not be accomplished better or cheaper by any other method. For details of this class of conveyor address the Jeffrey Manufacturing Company, at Columbus, Ohio, or any of its branches.

"While ten men watch for chances, one man makes chances; while ten men wait for something to turn up, one man turns something up; so, while ten men fail, one succeeds and is called a man of luck—the favorite of fortune. There is no luck like pluck, and fortune most favors those who are most indifferent to fortune."—Hallett.

AMERICAN IMPORTS AND EXPORTS OF BRICKS AND CLAY.

Washington, D. C., March 29, 1898.—The following imports and exports of bricks and clay have just been completed for the month of January, the latest period for which the official figures have been compiled by the Treasury Department:

The amount of building brick exported amounted to 99 M, valued at \$647, against 252 M, valued at \$1,500, during January of 1897. The total for the seven months amount to 2,418 M, valued at \$16,058, as compared with 2,697 M the year before, valued at \$16,804.

Fire brick was exported to the value of \$4,695, as against \$5,191 worth exported in 1897. The total for the seven months amounted to \$66,088, as against \$74,134 worth during the corresponding period last year.

The dutiable imports of clay for the month of January amounted to 10,248 tons, valued at \$69,596, as against 6,511 tons last year, valued at \$47,715. The total for the seven months amounted to 50,977 tons, valued at \$415,166, as compared with 53,304 tons, valued at \$385,806.

The dutiable re-exports of clay are shown to be very small; one ton was re-exported in January, valued at \$6. There were no re-exports in January of 1897. The total for the seven months amounted to one ton, valued at \$14, as against twenty-one tons, valued at \$21, the year before.

THE OHIO VALLEY CLAY WORKS AFLOAT.

I SUPPOSE that the readers of the Clay-Worker have read in the daily papers the accounts of the high waters which Ohio, Pennsylvania, West Virginia and Kentucky have just experienced. The Ohio river has been known to have been much higher and probably more destructive than it was last week, but some of the Ohio river tributaries have never been known to have been so high or so destructive in the history of civilization as they were last week. No one can conceive how destructive such a river can be while in its mad rush but those who have built their residence, place of business or their factory within the reach of such a river. Many of you, no doubt, have visited the Ohio valley, which is, I venture to say, the center of the clayworking industry of the United States, and have noticed that many of the best factories are built just on the water's edge when the river is at its normal stage. Why should they locate in such a place? Some for convenience in shipping their products by river; some for convenience of cheap coal by river, and others for the clay; and some thought they were high enough to be safe from the overflows, but just now there's scarcely a manufacturer along the Ohio river who does not wish he had located somewhere else where there was plenty of clay, coal and shipping facilities and no high water to annoy them. But who knows the damage done as well as the potter, the sewer-pipe manufacturer or the brickmaker who sits in his factory watching the water creeping inch by inch up the bank and into the factory, where there is so much green ware stacked and which is a total loss when once reached? The writer stood on the Ohio bank of the river at Toronto, watching the river slowly but surely creeping up to the danger line. It rose at the rate of six to eight inches per hour into the brickyard and sewer-pipe factory located on the opposite side in West Virginia. Yet, while it was so destructive, it was interesting for the writer to watch the effect of the water as it made its way into a kiln of ware which was under full fire. The results were something terrible, for not only was there one kiln, but many, as each factory had several burning at the same time. A great many factories along the river were treated in the same way. While a great many of you can realize the damage that could be done to a brickyard or a sewer-pipe factory, you must not lose sight of the destruction it can do to a whiteware pottery. While the writer has made clays a special study, he is at present employed in a pottery, and knows something of the importance of this industry. It is interesting to notice the precaution the potter takes in preparing the composition of his ware, in keeping out the particles which may affect it and prevent its

burning perfectly white, which is very important. You would be surprised to know how sensitive this composition is to any foreign substance, and of course the river in its mad rush carries so much sediment and objectionable matter to white-burning clay. Of course, more or less of this matter is deposited whenever the river begins to go down. While the river last week was not as high by six inches as it was in '91, and by four feet six inches as it was in '86, it was three and four feet in a great many potteries in East Liverpool, Ohio, and as there is no means of purifying this material once the dirty water gets into the bins of raw material, the latter must all be thrown away. As the potter carries a great deal of this material on hand, which costs him, laid down at his works, from \$7 to \$15 per ton, you can form an idea of the loss the potters sustained.

There is yet another industry which is just as sensitive to the high water and its destructiveness at the pottery, and that is the glass manufacture. The composition of glass is much more sensitive to foreign matter than the potter's composition for his ware, for how quickly one can notice the objectionable matter in a clear pane of glass or a glass vessel. The Specialty Glass Company, of East Liverpool, a twelve-pot factory, and employing 125 hands, was totally destroyed by this last high water. I will not try to give the effects of the flood on this factory, but it is claimed by the owners that the water getting into the raw material caused a combustion which set fire to the factory, and as it was surrounded by water, the fire depart-



A GREAT POTTERY WATER-BOUND.

ment could not reach it to do any good, and consequently it burned to the water's edge.

The accompanying picture was taken after the river had fallen several feet. It is looking at the Chelsea China Company from the West Virginia shore, and the factory across the river is Freemond and Calumet sewer-pipe works. The Chelsea China Company was started by John Potter in 1889 at New Cumberland, W. Va., and the works have cost something like \$156,500. It was run very steadily until 1896, when it closed down. It has not turned a wheel since. It is one of the best built potteries for convenience of handling ware that the writer has ever seen.

A CERAMIC CHEMIST.

Toronto, Ohio, April 5, 1898.

HISTORY REPEATS ITSELF.

I have given bricks some serious thoughts, searched ancient history, and find the first brick was made by Adam. Eve became discontented and wanted to see the outside world and induced Adam to boost her up the apple tree, so she could reach the forbidden fruit and get a "ticket of leave." After making herself a large palm-leaf hat and a ruffled skirt of fig leaves, they wandered forth. Becoming tired, sat down by a brook and made mud-pies. Adam soon discovered they hardened by the sun, and exclaimed "Eureka!" and immediately advertised a clay bed for sale. Later we find the Israelites were cutting prices just the same as they do in St. Louis and Pittsburg.—Gleason.

Written for the CLAY-WORKER.

THE USE AND ABUSE OF CLAYWORKING MACHINERY. Second Paper.

BY A MASTER MECHANIC.



IN MY FIRST PAPER I gave a synopsis of the items I propose to treat upon under the above heading, and stated that I would commence at the beginning with the machinery used for digging the clay or shale from the bank, mine or bed. The less informed operator whose time, means or opportunity limited his knowledge in this direction may learn from this that during the last ten years machinery has been adopted very extensively by nearly all the large and progressive brick-makers where the conditions allowed the same to be used. Steam shovels stand prominent, yet dredges must also be considered, although not employed so extensively.

In selecting a steam shovel several essential points should be taken account of. First, whether the daily capacity of the yard is sufficient to warrant the use of an excavator, taking into consideration the saving over the old method of excavating the material and loading it into cars, carts or other conveyance, and the mixing of the material. It is usually conceded by brick manufacturers that any plant to which a steam shovel is adapted that has a daily capacity of fifty thousand brick cannot afford to get along without a steam shovel to excavate their clay; and the harder, and consequently the more expensive, the material is to excavate, the stronger the argument for their use. By using powerful machines very hard shale can be excavated without explosives, but in some cases it is necessary to loosen the material with explosives, after which it can be thrown out and loaded with the shovel. In most cases a large saving over the old methods of excavating clay can be made, but one of the strongest arguments in favor of the use of excavating machinery is the thorough mixing of the clay. In many places it becomes necessary to use the clay and top soil together, also two or three variable stratifications found in the bank, both for the sake of economy and for enhancing the quality of the ware. This the steam shovel accomplishes admirably. In its operation the dipper beginning at the bottom of the bank and cutting upwards through the bank, a little of each stratum is taken and a thorough intermixture takes place in the bucket. Then again, as it dumps its contents the different clays intermix further, and finally, after the clay is dumped into the granulators, a very thorough mixing process has taken place. It will be readily seen that a much better intermingling of the raw materials can be thus secured than is possible by any other method now employed.

Having decided the advisability of using the steam shovel in the clay bank fitted for its use, we will now consider the points which make such a machine durable and efficient. The steam shovel may be equipped with either a vertical or a horizontal boiler, as a purchaser may prefer. Both of these types of boilers have advantages peculiar to themselves. The vertical is the quickest steaming boiler, as the lower flue sheet or crown sheet is directly over the fire, but it requires more careful attention than the horizontal type. With either type the capacity of the boiler should be in excess of the capacity of the engines, and should be constructed of good material of not less than 60,000 pounds tensile strength to the square inch, and the workmanship should be good throughout. Unfortunately, the water supply used in these boilers is often filled with impurities; this cannot always be avoided. Of course, if possible, clear water should be used. As this cannot always be secured, and even the cleanest looking water may be strongly impregnated with sulphate, phosphate and carbonate of lime and other impurities, which are deposited, by boiling, in the form of scale or mud—as this is often unavoidable, we must seek to alleviate the trouble with such remedies as are found efficient in the premises. There are boiler-compound companies who will care-

ing nothing for such analysis, and will then furnish a special compound prepared to meet the peculiar requirements of any water. By its use the impurities may be kept in solution and prevented from forming a scale on the flue and flue sheets, which would not only injure its steaming qualities, but greatly shorten the life of a boiler. By frequently washing out the boiler and keeping it free from scale, the vertical boiler will be as durable as the horizontal, and takes up very much less space, leaving more room in the shovel for a fire room, work bench and other conveniences. But it is a well-known and undisputed fact that the horizontal boiler will stand more abuse than the vertical. The abuses to which the ordinary boiler is usually subjected are too numerous and would require too much space to be fully treated here. The feed apparatus should be a steam pump or inspirator, or both, as may be desired. The engines should be well made and according to well-known scientific principles, and above all, while they should have ample power for all requirements, they should be the weakest part of the whole machine. In other words, a steam shovel should be so proportioned that the engines can be stalled without injury to any of the machinery. For instance, should the dipper be going up the bank and come in contact with rock or any hard substance, or should the cranesman force the dipper into the bank too far, the engines would be stalled without damage to the machinery.

There are many styles of frictions and friction clutches, but the style more generally adopted is what is known as the cone or dishpan friction. Other styles require very careful adjustment and constant watching in order to get satisfactory results. But the cone type has a friction bearing extending around the entire circumference of the cone, and an even bearing on the friction surface is had all around the cone. This is true until the fibre is entirely worn out. Vulcanized fibre is the most satisfactory friction surface, although wood, metal and other substances have been used in some cases with fair results.

The chains should all be of sufficient strength and made of the best quality of chain iron. Steel has been experimented with largely for chains, but with very unsatisfactory results. The chains should be kept as free from gravel or clay as possible, and should the chains come in contact with the clay by caving of banks or otherwise, it is a good plan to have the fireman stand on running-board of crane and pour a few pails of water on the chain as the operators raise and lower the dipper. Then when the chain is sufficiently dry it should be well oiled with a good quality of ordinary black oil, which is suitable for all of the machinery, with the exception of the engines, engine valves and cylinders, where tallow or good valve oil should be used.

A steam shovel should be constructed of good material in all its parts, and as strong and durable as a well-considered design will make them. The mechanism should be simple, quick and easily controlled. All machines of same class should have identical details, the parts being made to exact templates and patterns, so that a part can be taken from one machine and used on another of the same class. They should be operated by competent men, as the best steam shovel ever constructed is a poor aggregation of steel, iron and wood when in the hands of incompetent operators.

A MEAN AMBITION.

The "Wellspring" tells the story of a young man who picked up a sovereign lying on the road. Ever afterward, as he walked along, he kept his eye steadfastly on the ground, in hope of finding another. In the course of his long life he picked up a goodly amount of gold and silver, but in all these years he saw not that the sky was bright above him and nature was beautiful around him, but kept his eye upon the mud and filth in which he sought the treasure; and when he died, a rich old man, he knew this fair earth of ours only as a dirty road in which to pick up money as he walked along.

CONVENTION CULLS.

IS THE FUTURE of the brick industry to be more profitable? The gentleman who asked that question has lots of fellow-brickmakers who voice his sentiments. It always has and always will be a business of prosperous as well as dull periods, with the non-money-making years the longest in duration. Clay in large quantities is found, one may say, lying around loose. Capital is abundant and looking for investment, so that if any improvement shows itself there are more yards and more millions made on a market now overstocked. Why do people not buy brick? All the arguments in the world will not cause the use of one thousand of brick in building unless they are compelled by a town law to build brick houses; and in many towns—that is, country towns—where such laws exist, by application to the town board permission is given to erect frame houses: Where does the law help brickmakers in such localities?

—Overproduction.—

Why should anyone have a horror of such a word when it is a clear reality? The brick trade is not the "only pebble on the beach." Why was the reduction made in the mills of New England this winter? Only because of that same word. There were not as many brick made during the past three years as the capacity of the yards was capable, still the market could consume them, brickmaking ceasing say in October and beginning in April, and furnish enough to supply all that is required. How would it be if one-half of the yards made rain or shine, winter and summer? What would be the result? By what name would you call the state of the market?

—Salmon Brick.—

What are they? When reading about salmon brick I was like the man in the thick woods without compass—wondering where "I was at." One would suppose that the fraternity the country over would class salmon brick alike—as a class of brick or grade of brick entirely different from hard. As one reads the different news in the Clay-Worker it would seem as if the grade is one kind in one section and color in another. The tide-water makers class salmon as to quality—that is, they are better than pale. As the fire has left them or worked off into another arch or rightly, they are generally found in a "cold spot" to a great extent. Sometimes they are called light hard. Is the salmon brick of the Convention one of quality or of color? As Mr. Purington asked, "Do you judge a salmon brick by its appearance or sound?" Mr. Hoff says, "I have salmon brick that ring like a bell." If so, he has something in the brick line that is a curiosity. Does he sell them at salmon brick price or class them as hard? A brick which has a hard-brick ring certainly is not a salmon brick, as there is no ring to that class of brick. Some of our yards burn to that color, but are not classed as salmon, but light red. One great fault with the stuff in this section is that it has a tendency to have a yellow cast, and when they are mixed up in a load with dark red brick they bring the color out very strongly. They are, however, as hard as flint. To illustrate the color: A few years ago they were building a sewer in town, and the brick furnished were good hard brick. In one arch a thousand or so brick with a yellow cast were found. The contractor would not use them and purchased of another yard. The gentleman of whom they bought the last lot went to the sewer and saw the brick of his neighbor laying one side. He asked why they did not use them. "Why, they are pale," was the reply. "Well," he said, "if those are pale, I am afraid that it is no use of sending any more, as my brick are of the same grade." He asked the inspector to take two of them and break them. He did so, and had to admit that he went only by color. So with the question of salmon brick—is it color or grade? If salmon ring like a bell, it would be to the benefit of the buyer if he buys at salmon rate, as certainly they will stand all kinds of climatic changes if they are hard enough to ring.

—Missionary Work.—

Why don't you put up a brick building? It would seem as if

this was a question that would come home to every brickmaker present. The many sides on which this question can be met simply narrows down to the one prime cause, and that is the cost. If one furnishes estimates on brick or frame, there is always a difference in favor of the wooden structure. In some sections they may be very close; in others quite a margin will be shown. The dollars and cents are what the American people look after, and many want a nice looking house, and wood can be used to make the exterior attractive at less cost than brick. If you paint a brick house there is no gain there. There are many things to recommend a brick house. In the course of discussion there were some pertinent points brought out, and one especially was how many had wrestled with the architects of their town in that matter. But few.

The appointment of a committee to look up the matter was a starting point, but would seem as if it would be far from satisfactory as a whole. There would have been a far more extensive collection of data and at no expense had the matter been left with the entire membership. That would have made every member of the Association a missionary in the cause of collecting in his own locality all matter pertaining to the use of building brick instead of frame. Where it now falls on three to do the collecting there would have been three hundred at the work, with a personal interest to work for, and if not able to attend the next Convention they could submit by letter their observation in their section. It would have brought the whole matter within the year.

There seems to be a general feeling on the part of the manufacturer to know what his ware is costing him, and some very elaborate ways of doing so are shown. The old way of sitting down on a wheelbarrow under the shed one of the finest days during the summer, when all the men are at work, and say that the brick were costing so much to make, when probably the next day he would have some at work under the shed, while the rest were laid off for the want of dry brick or rain. This is not an overdrawn picture by any means. As one said, it is of no use to wait a year to know. From one pay day to the next—the yards here pay every two weeks and pay all that is due the men, which amounts to a certain sum. The time book shows how many pits have been molded, and represents so many thousand brick; divide the one by the other, and the manufacturer knows to the cent what it cost him to do the work of making so many green brick; and if during that time he has burned kilns, it is there in shape of extra night work. If he adds twenty cents per thousand on the make of brick, he then knows what it will cost him to load them in the spring and fall, or the cost of making and loading. As far as feed and repairs and the other incidentals, he can tell by referring to each separate account the total cost of making. Nothing complicated or the need of calling on the men to do what a foreman does on all yards—take time of men. The majority of brickmakers do not want to wrestle with a set of accounts, which would be more work to them than running the yard, and to figure out the average cost would be a hard job indeed to many.

The few culls found among so many sound brick is a pleasing sight. It is for the good of the trade that only sound, square, full-sized brick are turned out. The standard size be what they may, it would seem as if it is playing with a buzz saw for the brickmakers to advocate the size of a brick. Better wait till the matter is forced on you by the builders, as the larger the brick the quicker the clay bank will disappear, and some of them are not overly large.

A. N. O.

THE CONVENTION PROFITABLE, EVEN AT LONG RANGE

Dear Mr. Randall:

Your valuable favor of the 5th ult. unfortunately only reached my hands to-day. Enclosed please find \$2 for renewal of my membership in the Association. Please be good enough to let me know if the \$2 includes the subscription to the Clay-Worker. If not, I will mail you the amount for the latter by next mail. I can assure you, dear sir, that the Clay-Worker has been of great help to me in my business. I would not do without it even if it cost \$2 per copy. I am always anxious to receive it every month. It has given more profitable information than I (in Jamaica) could possibly have obtained in a lifetime. I think the Pittsburg Convention something grand. I am only sorry I was not one of the happy participants. Wishing the Association all the prosperity it so highly and richly earns and deserves, believe me,

Fraternally yours,

E. W. THORNBURN.

Kingston, Jamaica, March 15, 1898.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

CONVENTION ECHOES.

What Does Your Brick Cost You?

Friend Randall:

Yours of the 11th inst. received and noted. After reading the report of the Pittsburg Convention and comparing same with reports of previous Conventions, I think that all will come to the conclusion that Pittsburg surpasses in interesting subjects discussed.

As stated in your editorial in Clay-Worker for February, one of the most important steps taken by the Convention was the appointment of a committee to collect facts and arguments for the increased use of brick in building. It would have been to the interest of clayworkers generally had the resolution of Mr. Gates also prevailed, appointing a committee on extension of trade and the use of clay ware in public and government buildings. The valuable paper on brickmakers' accounts, while referring to the manufacture of face brick, applies equally to common brick, and if some of the "know-it-all" brick manufacturers will read carefully Mr. Hoagland's well-written paper it may not only benefit themselves, but also their competitors. After reading and carefully considering the matter, they no doubt will come to the conclusion that the extras are an important part of the cost of brick.

Baltimore, Md., March 24, 1898. CHAS. H. CLASSEN.

Brickmaker Know Thyself and Thy Neighbor Too.

My Dear Randall:

Your letter asking what became of me during the Pittsburg Convention was received in due time. I had fully intended to respond to your kind invitation to appear at the powwow, and also expected to attend the sessions of the Convention, but was unexpectedly called out of the city on important business. It was my misfortune, I am sure, for I know I would have enjoyed the meetings immensely.

As you know, I am not a brickmaker, but, as Secretary of the National Fire Brick Manufacturers' Association, have been a weak cement, trying to bind together members of that branch of the clay industries in local organization, fighting their tariff battles from the Mills bill down to Dingley. I would like to comply with your request and draw from my coke oven a few scattering thoughts for the members of the N. B. M. A. and other readers of the Clay-Worker, but cannot just now for lack of time. However, I wish to say that I enjoyed what little I saw of the Convention. Certainly the members take a very active interest in the work. Let me say right here, I have been connected with a number of manufacturing interests, have attended a great many similar gatherings, and can truly say none give as much time to details as do you. Other similar bodies seldom or never give more than two days to convention work, and that is spent chiefly in smokers, theater parties, banquets, and only a few hours to the election of officers, routine business and short speeches, and yet good is accomplished. They touch elbows, renew acquaintances, look each other in the face each year, and are benefited. Verily, it pays to know men that are one's competitors.

In an interview with a prominent manufacturer, last week, he said: "With all the modern improvements in machinery,

and experience, we can all make first-class goods. The great secret is how to market them. We can hire competent superintendents and managers, but the brains that can convince customers that our goods and prices are better than others are difficult to find. To get and hold trade these times, one must both hunt and hustle. Especially is it difficult to market goods at profitable prices, and anything that we can do to help in this direction should be done, and done again, over and over, till trade conditions are permanently improved."

In closing, let me say that I have watched your work in connection with the National Association of Brick Manufacturers critically for several years, and wish to give you personally credit for its success. I do not believe that anyone who has not been connected with similar organizations in a similar capacity can appreciate what you have done for the brick manufacturers. As Secretary of the Fire Brick Manufacturers, I can appreciate what you have done. You deserve more credit than you will get on this earth. Yours with esteem,

HENRY GLEASON,

Secretary N. A. F. B. M.

New York, April 14, 1898.

Pleasant Memories and Bright Anticipations.

My Dear Randall:

Lingering like a sweet fragrance is the memory of our last Pittsburg Convention, and as our mind turns now and then from busy scenes toward the Smoky City, we are led to exclaim: Was there ever a craft who grasped the hand of stranger or acquaintance with a heartier welcome? Those grand, true men of Pittsburg will ever live in our memories, and the few pleasant days spent among them will stay with us in spite of smoke and cloud and time. The lessons, the experiences and the knowledge gained at the Convention will spur us on to higher attainments and greater developments in our business; but in the midst of all that which was encouraging there were voices like Rachel's of old, "weeping and would not be comforted." They told us of dark days and no profits, and of the vast amount of construction which needed little of their products. Others told us of vast sums which had melted away into the mists during the last year. Then came the great question, What shall we do? While in some sections victory has been complete, in others great losses have been sustained, and now comes the vital subject, How shall we meet these conditions? We believe upon each clayworker rests this responsibility. The business conditions in different sections are not alike. The bringing together of data from all quarters will unravel some of the tangle. In every section a greater effort should be made to educate the people up from a combustible to a fire-proof standard.

Every man interested in any clay production must put his shoulder to the wheel and push. If the energy and zeal of our Conventions is indicative, victory will be ours. Talk this subject to every architect, builder, Congressman, or anyone intending to build, especially to the editors of papers. Here, we would remark, is a still greater field for all our clayworking journals, for upon them will rest the pioneer work. They can best reach the ones most interested and stir them up to the necessities of the situation. In other productions great efforts are being made to educate the people. We are confident that the clay interests are equal to the situation, and with the help of our clay journals we shall be able to accomplish great results.

And now, as one of a committee to gather facts on this subject, my dear Brother Randall, we request that you urge this question in every issue of your good paper. We want figures, facts and suggestions from every quarter. Then, if compiled in pamphlet form, or in some other way spread broadcast over the country, a work will have been accomplished which will last, we believe, through ages to come.

And now a word to the craft. We have much to lose and more to gain. We trust the coming year will be an improvement over some which have passed, but in the midst of your cares and responsibilities do not forget this subject. It is "biz"

with interest to you and yours. Concentrated action and constant agitation will bring about the results desired. This committee can do little without your help. We urge immediate action in all quarters.

Syracuse, N. Y.

Very truly yours,

C. H. MERRICK.

Gaseous Fuel in Kilns, Etc.

Editor Clay-Worker:

In the January issue of the Clay-Worker Mr. Waplington does me the honor of criticising some of my statements in regard to the watersmoking with fuel gas. I consider his statements the opinion of an expert in this special line, and am thankful for any corrections he may see fit to make. Being quite enthusiastic myself concerning the application of fuel gas in the ceramic industries, I certainly should not be reluctant in accepting his assertions.

In defense of my remarks, however, I want to say that they were based upon information obtained from users of fuel gas. It was their opinion that the fuel consumption is somewhat greater with gas, but that its advantages overbalance this loss. The fuel used for producing gas in the factories visited by the writer was of an inferior kind. Whether or not the gas generators in question were of the most economical kind I could not say. Stegmann, in his standard treatise on gas firing, cites the case of a kiln fired with coal and fuel gas. The consumption of fuel was found to be larger with the use of gas. It must be remembered, however, that those men use as the basis of their calculation the fuel consumption of the continuous kiln, which is low in itself.

Mendheim and Stegmann, two practical gas engineers, also claim that the watersmoking of ordinary periodic kilns with fuel gas is attended with difficulties until a red heat has been raised in the kiln.

I am convinced that gas firing is the best friend of the continuous kiln. The use of fuel gas will make it possible for this ideal kiln, in which, by the way, the question of utilizing the heat of the cooling ware is solved, to be used in the manufacture of the better grades of ware with the minimum of fuel consumption.

AMERICUS.

Brick Versus Wood Buildings.

Editor Clay-Worker:

Here in Minneapolis we seem to be located a little off and north of the "brick belt." It is true there are some brick made here, say about 30,000,000 annually, but Minneapolis is not a brick city. The majority of the dwelling-houses are made of wood. This is but natural, as here we have the largest yearly output of lumber in the United States, if not in the world, this being upwards of 400,000,000 feet yearly. This demand will at no very distant day use up the supply of lumber-making material, and then brick buildings will take the place of wooden buildings.

This reminds me of the valuable paper contributed by Mr. Buell and read at the late Convention held at Pittsburg. The paper suggests a move in the right direction, and should be carefully considered by every brickmaker in the country. The comparative cost of brick and wooden buildings is something of a revelation to the average citizen. Then the consideration of the economy in the matter of heating and the life of the building is a matter of no little importance. Whilst the paper was excellent as a starter, the matter of economy in fuel, the comparative life of brick and wooden buildings, will bear a little further consideration.

In the discussion of the paper some one, guess Gates ajar, hinted briefly at other points of great importance, but which are sadly overlooked, namely, the comparative safety from fire in a brick building of our loved ones as compared with their exposure in frame buildings. This matter and the desirability of making dwelling-houses fire-proof should receive more attention at the hands of brickmakers' associations. It would be a good thing to have a small fund provided by the Association and a committee to prepare a brief paper on this subject, giving a comparative statement of cost between brick and frame buildings, comparative life of the buildings, comparative increase of the value of the property, decrease in the expense of heating, insurance, etc., and, greater than all else, comparative safety from fire of one's family in a house that is nearly fire-proof. Then the desirability of making dwellings fire-proof should be presented. Hollow walls, warm in winter and cool in summer, is a matter not much considered in choosing between wood and brick. I think every newspaper in the country

would freely publish such a paper for the benefit of its readers. If such a statement, so interesting in facts, was properly laid before the people and revived from time to time, it would do more to promote an increased use of brick than anything else I can think of.

In justice to this city of the Falls of St. Anthony, I should say it excels in one other matter besides being the largest lumber market. It is the largest wheat-receiving and flour-producing city in the world, the mills here giving about 60,000,000 bushels of wheat annually, and turning out over 13,000,000 barrels of flour—and such flour as has no superior anywhere.

J. K. CALDWELL.

From the Brickyard to Legislative Halls.

Publishers Clay-Worker:

Enclosed you will please find \$2 as one year's subscription to the Clay-Worker. Kindly acknowledge same and oblige. I may not get much time to read the Clay-Worker now, as my friends got me into politics and elected me to the local Legislature (Ontario House of Representatives). Wishing you success in helping poor mud-pounders onto the road of prosperity. I have put in twenty-nine years at brickmaking, so guess I can stand a season or two among the law-makers of the Dominion.

S. J. FOX, M. P. P.-elect for West Victoria.

Lindsay, March 18, 1898.

Hollow Block, Brick and Pipe Sewers.

Editor Clay-Worker:

In the March issue of the Clay-Worker I notice an article on "Hollow Ware Sewers," which introduces and describes a new material for this use, or rather a new adaptation of the well-known hollow fire-proof material now so universally used in all modern buildings of any pretensions.

I note what Mr. Colton has to say about this new departure in sewer building, and while the material can no doubt be made without great difficulty, and the sewer, when constructed, will be a good one if the work is properly and carefully done, there does not to me appear to be such a manifest advantage as he claims in the sewer constructed of this material over the ordinary brick sewer, either in economy or efficiency. The completed sewer, being composed of parts—practically large bricks—and built over stretches of soil of various resisting qualities, would be subject to the same effects of settlement and disturbance of alignment that would result in the case of the brick sewer, and the parts composing the bottom segments of the sewer would, it seems to me, be even more liable to displacement by reason of settlement of the ground, unless a solid concrete foundation six or eight inches in depth was laid the entire length of the sewer.

Nor would the inside surface of the sewer, when completed, necessarily be smoother than a brick sewer, for all those who have had experience in the manufacture of hollow ware or fire-proofing material can testify to the difficulties attending the manufacture of this material when it is required to be true and exact in shape. Fire-proof material for use in the construction of modern buildings does not need to be exact in shape or uniformly of the best quality, but for use in sewer construction on the lines laid out by Mr. Colton it would call for the uniform excellence of quality and exactness of detail and finish, which would add largely to its value and efficiency, and without which the results aimed at and claimed by Mr. Colton could not be reached, and not even then with certainty without the concrete foundation.

In view of this, I cannot see how the sewer of this material can be constructed at a cost that will make it preferred to well-constructed brick sewers, or to the large sizes of vitrified pipe—27, 30, 33 and 36 inches in diameter—which the Blackmer & Post Pipe Company have for some time been making, and which in scores of instances the past few years have been used in all parts of the country in preference to brick sewers, both on account of the economy of the first cost and because of the superior quality of the pipe sewer when completed.

The advantages claimed by Mr. Colton for the "web tile" sewer, but not yet proven in practice, are all clearly shown in the large sizes of pipe. Being made in 2½-foot lengths, with extra deep sockets, making strong and tight joints possible, when properly laid the line of pipe is practically one solid tube, with smoothly glazed, unbroken inner surface, which will retain its alignment under all conditions and circumstances; its capacity being largely in excess of any sewer constructed of brick or other similar material, while a considerable saving of

labor is effected by reason of the less excavation required and the greater rapidity with which the work may be prosecuted.

The use of these large sizes of vitrified pipe is now quite common, the company with which I am connected having sold over 64,000 feet of 27, 30 and 36-inch pipe during the past two years, a large part of which was used in direct competition with and was preferred to brick sewers, in some instances at some greater cost.

It is probable that vitrified pipe will not for many years be made larger than 48 inches in diameter (36-inch is the largest now made), on account of the physical difficulties attending its manufacture, and for this reason it may be that the web tile sewer will find its place in practical use for the larger class of sewers, but I doubt it.

L. W. POST.

Glazed Brick.

Editor Clay-Worker:

In writing the articles under the heading of "Modern American Front Brick" it is the intention of the writer to bring out ideas and possibilities to which hitherto little attention has been paid, and some of which may appear novel and even strange. I am glad that they are provoking discussion. The writer, in addressing himself principally to front brick manufacturers, is aware that he is dealing with an intelligent body of men who will not be slow to take up what is good and reject what seems impracticable. The men who cater to the American front brick market, which demands the best brick in the world as to color, shape and minimum of absorption, are certainly not very likely to become "saintly martyrs" to which "Critic" alludes in the March Clay-Worker.

In view of the fact that our pressed brick are prepared as thoroughly as machinery can do it, that the front brick market is extremely capricious, resulting in the accumulation of many thousand brick which, though perfect in shape, are not quite right in color, and finally that almost every buff brick maker has a vein of clay which he must remove without using it, on account of the color, it seems proper that some measure should be proposed which makes use of this material on a profitable basis. At the same time there exists a demand for glazed brick in places where the high-priced product is absolutely out of question. In work rooms, machine rooms, basements, kitchens, stables, breweries, etc., a cheaper glazed brick is certainly a much-needed article. Considered, also, from the standpoint of business ethics, I really cannot understand why catering to this demand should exert a demoralizing influence. A brick of this description would certainly not antagonize the expensive enameled brick.

Now, in regard to the technical difficulties, I have stated quite distinctly that a clay to be used for this purpose must burn white or buff and be free from concretionary matter. These conditions rule out a good many clays, and with clays conforming to them I cannot perceive any invincible technical difficulties. Off-colored brick are actually utilized in this way to-day in Europe. A brick carrying a glaze corresponding in composition to Seger cone No. 4 has certainly a decided claim to durability.

That it is not my intention to paint the path of the prospective glazed brick manufacturer in the most alluring colors will be evident from a perusal of the articles on the subject. But it is my candid opinion that technically, as well as financially, it is possible to utilize white or buff-burning off-shade brick in the way indicated.

I feel indebted to "Critic" for so frankly expressing his opinion. Only through discussion can we hope to arrive at definite conclusions.

AMERICUS.

May Want a Dry Press.

Editor Clay-Worker:

Enclosed please find check for \$2 to pay for the Clay-Worker for another year.

We were kept going all winter, have shipped over a million brick since January 1st, and have a little over 1,500,000 to deliver on present orders. Hope it will so continue. Prices are rather low in this section of the country—all the makers' fault without a doubt. We probably average 25 cents per thousand more than any of the others, for the simple reason that we prefer shutting down to selling at or below cost, as it happened last season. We are the only brickmakers in operation since last October. We have no organization, and are sorry for it. We had one in 1891, and it lasted just about three months, when one or two of them cut prices, and that settled the organization.

We may possibly be in the market for a dry clay press, etc., in the near future. Nothing definitely settled as yet. Could write you a volume on the subject of "ifs" and "ands" had I the time, but will let you escape this time.

South Bethlehem, Pa., March 27th. SWOYER BROS.

Try Water.

Dear Clay-Worker:

I saw in one of your columns a recipe for staining brick walls. Now I have all the ingredients except the liquid part. That we have in almost every form—corn juice, rye and barley juice, kerosene oil, and an abundance of Adam's ale. Now please specify the liquid and I will test the recipe, and very much oblige a charter subscriber of the Clay-Worker.

April 4, 1898.

GEORGE H. JENKINS.

A Traveler's Notes.

Editor Clay-Worker:

I have recently visited a number of cities in northern Ohio, and had the pleasure of meeting several of the brickmakers of this section, all of whom seem well-to-do. The business appears to be quite satisfactory, and, thinking the Clay-Worker might like to hear from this section, I send you the following items, gathered hurriedly.

—At Detroit, Mich.—

The brick trade here in Detroit is in good condition. The manufacturers are looking forward to a busy season, and reports by manufacturers' agents are anything but discouraging. In short, the Michigan clay industry entire, as far as it is reflected here, seems to enjoy a substantial improvement.

Henry Houghton, who is also President of the Detroit Pressed Brick Company, reports a good, steady demand in fire brick.

The opening of navigation is giving the shipping traffic a decided impetus.

A big building season is the outlook here and at all the Michigan centers, brick material representing a larger quota in the specifications than at any previous period.

Thomas Bros. & Co. are reporting all lines in good demand. They are sole Detroit agents for the Hydraulic Pressed Brick Companies' product.

The F. H. Wolf Brick Company are a busy concern. Common, stock and molded brick are moving in quantities not reached in years. Their daily shipping capacity of 300,000 is not infrequently taxed these days.

E. T. Adams says the demand for pressed and ornamental brick, his specialty, is of satisfactory volume.

C. L. Palms, Secretary of the Cayuga Pressed Brick Company, reports the Detroit end of the business as satisfactory.

L. K. Hennes, Secretary of the Warren Brick and Tile Company, Limited, expects the best of results during the present building season.

J. C. McDonald & Son report good trade in both brick and tile.

George H. Clippert & Bro. and Jacob Daniel & Bro. say the local manufacturing interests are in very fair condition. The outlook is for a big year.

—Toledo, Ohio, News.—

Local clayworkers are fairly well employed just now. The building outlook is very bright. The permits thus far issued exceed by a large percentage last spring's doings.

W. A. Howell, of the Collingwood Brick Company, says business is good.

C. J. Spear, Manager of the Findlay Hydraulic Pressed Brick Company, and Secretary of the Toledo Brick Supply Company, reports business for both accounts of the best order.

David Jamieson, Manager of the Jamieson Brick Company, says business is looking up in the general brick line.

Robert Cummings, of the Kohler Brick Company, reports activity of a satisfactory character.

H. C. Ellis, President of the Fox Brick Company, thinks business will be all right this year.

Joseph F. H. Gates, of the East Toledo Brick Company, says the local industry is experiencing a great improvement.

J. P. Boice and the Buckeye Brick Company report a good, steady demand, but business not very satisfactory, owing to competitive price-cutting.

—At Columbus, Ohio.—

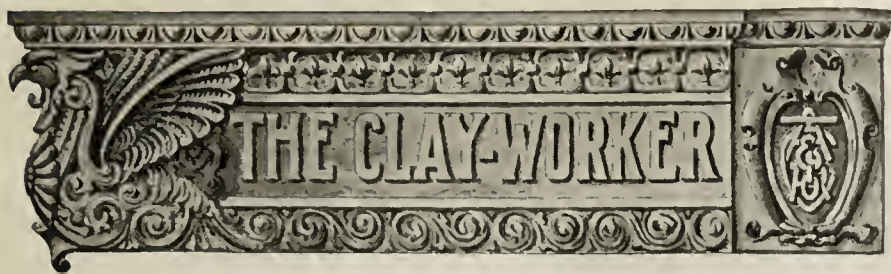
E. C. Kissinger says both common and pressed brick are now moving in appreciable quantities.

The Columbus Brick and Terra Cotta Company are very busy filling contracts. Everybody seems to be building about here, and everybody seems to favor brick material.

N. Whiting, Secretary of the Columbus Sewer Pipe Company, says their line is yet a little neglected, but looks for a big summer trade.

Benjamin Styles, of the Standard Clay Company, says the outlook for the local industry was seldom brighter. There's movement in everything.

J. B. R.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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|---|---------|
| One copy, one year (in advance) | \$ 2.00 |
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| Ten copies, " " " " " " | 15.00 |

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Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXIX.

APRIL, 1898.

No 4.

CURRENT COMMENT.

A purely typographical error occurs on page 323. The last word of the last line of the first paragraph should be analyst, not analysis. We say *purely* because the author's copy is clear, and we wish to put the responsibility on the compo., where it belongs.

* * *

As we go to press the town talk is all of war, and it really seems as if the war of words now going on in Congress will be speedily followed by the real article. If it must come, we can but pray that the conflict will be brief and decisive. The result can scarcely be in doubt, but the victory, which seems assured to us in advance, may cost the nation dearly.

* * *

War, always a horrible pastime for nations to indulge in, is much more horrible and disastrous to-day than ever before in the world's history. With the awful death-dealing explosives and the mechanical means by which they are controlled and sent forth on their mission of destruction, real war is a matter of annihilation almost. Appreciating this fact, is it any wonder that the powers strive for peace?

* * *

Already trade is affected some by so much war talk, but this feature will be less hurtful than many at first suppose. Fighting Spain will not be so serious a matter as putting down the rebellion. On the contrary, it will stimulate many lines of business, give employment to thousands, and cause the expenditure of vast sums of money, thus tending toward a speculative rather than a conservative era.

* * *

Success is a theme of never ending interest alike to young and old. Mr. Purington's address to the class in ceramics at Columbus, given on page 315, treats the subject in a very happy and forceful way. His remarks are all the more impressive be-

cause he himself is a living example of the best success—the success that comes from honest industry, steadfast purpose and diligent striving for high ideals.

* * *

Mr. Purington's success is not of the sort that may be measured alone by a dollar mark and a row of figures. It is of a broader and more enduring character by far. The young men composing Prof. Orton's school for clayworkers will do well to heed well his advice, emulate his example, and strive for a similar success. If they achieve it, the world will be much better for their effort.

* * *

Our older readers will observe with pleasure the reappearance of "Hints on Brickmaking." The first of a new series of "Hints" will be found on a preceding page. While we do not care to assume the role of a prophet, we predict that the new series of "Hints" will prove just as entertaining and instructive to old brickmakers and just as helpful to those new in the business as any that have gone before, and that is saying a great deal.

* * *

The move to encourage and stimulate a larger use of brick meets with the universal approval of the brickmaking fraternity, as it should. Brickmakers are not only willing but anxious that others should build more generally of brick, even if they (the brickmakers) do build their own factories of wood and live in frame or stone houses. It seems the shoemaker's children will go barefoot.

THE LABOR PROBLEM.

We hardly need call attention to the paper of Brother Waplington on the labor problem. How to solve it is the burning social question of the hour, and those who know the author personally will turn to it expecting to receive light. He fully recognizes the introduction of labor-saving machinery in every industry as the chief if not the only disturbing cause of the departure from the rude or normal condition of society which has turned at least two-thirds the wage-earners of the world from their chosen line of work, or what they would choose if they were left free; yet if he suggests any remedy materially different from that suggested by the Clay-Worker in our August number, we fail to find it. It is very easy to say that the successful colored man, whose example of industry and frugality we quoted and commended, works a hardship on his fellow wage-earners, by picking up a job wherever he can get one, even outside his professional calling, and at very low rates, when he cannot obtain higher; but the fact of his prosperity remains, with the inference that others might prosper by doing likewise, and the counter-fact that thousands who refuse to work in this manner are idle and hungry remains also. He wholly ignores a comparison fact which so interlocks with low wages, where higher can be commanded, as to become an inseparable part of the remedy we suggest. Low wages create a market for labor where it would not otherwise exist. Thousands eat butter when it is ten cents a pound who would not eat it at all at twenty-five cents, or who would eat it so sparingly that the demand would be greatly curtailed, just as thousands can afford to use brick at \$5 who could not at \$10. Many a man can afford to pay twenty-five cents for an article he would do without—would have to—if it were two or three times that price. Who is the loser and who the gainer in such a case? The popular fallacy on this subject—and we are surprised that so broad a man as Brother Waplington even leans toward it—is, that employers are all full of money, and that the employe is at liberty to appropriate whatever of it he can, or not work at all. He assumes that the man who refuses to pay more than a quarter for a job says to the wage-earner, "Take what I choose to give you and be satisfied," with the air of an oppressor, whereas, in nine cases out of ten, when reduced to ultimate analysis, the employer is as poor as the

employe, and finds it quite as necessary to be economical in his expenditures—to do a job himself or let it go undone, to buy a pair of cheap shoes or to buy none, to buy brick at \$5 or postpone his improvement till he has more money, if not forever. The men who buy brick or boots are not all millionaires or thousand-aires; they are the common people, and from the millionaire to the hod-carrier they are environed by conditions not of their own creating, which make it impossible to pay the same price to-day they paid yesterday for any article they need; and the law that governs this fact is no more under the control of human legislation, human solution, than the law of gravitation is.

This labor question is a complicated one. What with the pernicious sentiment, too common by half, that the world owes everybody a living, whether he works for it or not, and therefore he need not work at all unless he can get his own price, and the companion pernicious statement that everybody who works and saves and has money to use is a proper person to prey upon, it is difficult to solve it. Will it ever be solved? Certainly not by the two-thirds who have been displaced by the labor-saving machinery combining and fixing arbitrary prices for their work and refusing to work or let any others work on any other terms. These combinations work all right enough for the few within them while they exist, but they are hard on the millions who cannot get in. Hence, until some remedy more practical can be suggested, we must insist that the best thing in sight for those who have been turned adrift by the introduction of labor-saving machinery is to seek employment in some other field at the best wages the over-supply of labor will command, remembering that no legislation on earth can repeal the law which makes work a condition of honest living, and that it is no more the duty of brickmakers to find employment at union prices for the thousands of printers and farm hands or miners whom machinery has turned away from what they love best than it is the duty of farmers and printers to find employment for the unneeded brickmakers. When that good time comes, which is surely coming, in which the golden rule of the Master, "Do unto others as ye would they should do unto you," obtains alike among the employers and employes, the details of this problem will be easily adjusted. The world is getting nearer this ideal every day. To array class against class does not hasten it; hence this arraying should cease at once and forever.

INSURANCE ON FIRE-PROOF BUILDINGS.

The question of fire rates on fire-proof buildings has always been a mixed one. We naturally expect a conservative estimate. There has always been the idea that owners of fire-proof structures have been getting the worst of it. However, there is a change in the matter of the consideration of these risks. In the Eastern cities, especially, rates are very low. One company has insured the New York Clearing House building to the amount of \$1,000,000 for \$500 for five years. It is said that large companies have accepted a risk as low as 8 cents for the same privilege. The manager of a large insurance company is quoted as saying: "If we wrote fire-proof buildings for nothing we could lose but little. The total destruction of fire-proof buildings in this city is practically an impossibility, and in some instances it would be difficult to do them \$100 damage under the most trying conditions." This, however, is in the city of New York.

The building regulations in the city of New York have been regarded as very rigid, but from the result, it would appear, not too much so. It is certain that the investors are now reaping the benefit in low rates of insurance.

A CHANGE OF BASE.

G. C. Stoll, the efficient Secretary of the Illinois Clayworkers' Association, advises us that he has removed from Grant Park, where he has resided for many years, to Wheaton, Ill., where he will be pleased to hear from anyone who may have anything to offer for the good of clayworkers in general and the Illinois Association in particular.

AN ARTS AND CRAFTS EXHIBITION.

There has just been opened in this city an arts and crafts exhibition, which indicates the movement of public schools and other educational forces along practical lines. This exhibition, under the auspices of the public school officials, unites the art of the easel and that of the handicraft. The exhibition occupies all of the walls and ceilings and much of the floor space of one of our large high school buildings. There is brought together the work of local painters, and as well those who are interested in other art work. There are large exhibitions of wood carving, furniture, terra cotta, tile work, pottery, and other branches of industrial work now being taught in the Industrial Training School. It is an interesting object-lesson that illustrates the practical trend of modern educational methods, which teach industry as well as knowledge.

TRADE LITERATURE.

"A FEW FACTS about the Brewer Brick Cutter" is the title of a leaflet received from H. Brewer & Co., Tecumseh, Mich. A cut of the cutter shows it to be comparatively simple in construction. It has a daily capacity of 50,000 to 75,000 brick, but is equally well adapted to machines of less capacity. They will gladly give further details on application.

THE LEHMAN SLUMMING APPARATUS is briefly described in an illustrated four-page pamphlet issued by F. Lehman & Co., foot of West Wellington street, Chicago. Slumming or washing clays is a matter American brickmakers know little about. It is generally thought to be an expensive process. This the Lehman Company claim is not the case, and assert that by their process the work of removing lime, pebbles, gravel, sand and other foreign substances can be done easily and with small expense. They are prepared to demonstrate this to any of our readers who are sufficiently interested to correspond with them on the subject, or, better, visit their works at above location and see the work in actual operation. The Lehman Portable Continuous Kiln, pictured on page 373, may be seen at same place.

"BRICK MACHINERY, SUPPLIES, ETC.," is the title of a handsome little catalogue published by the Wellington Machine Company, Wellington, Ohio. There are a number of fine half-tone illustrations of the "Monarch" and "Quaker" brick machines, also their improved brick trucks, barrows, molds, etc., etc., which they make in endless variety. Those needing anything in the way of brick or tileyard supplies will find what they want illustrated in this little book, a copy of which can be had for the asking.

WE ARE INDEBTED to Mr. E. A. Ford, G. P. A. Pennsylvania Lines, Pittsburg, for a copy of an exquisite little brochure entitled "The Pennsylvania Limited as Seen by a Passenger." The cover is a dainty lavender-colored paper, with the title embossed in gold. The descriptive matter is embellished with beautiful half-tone engravings of the train, interior of the cars, and views along the line, made from "photographs as true to the real as the camera can make them;" all of which goes to prove the assertion that the Pennsylvania Limited is "the most complete railway train of this progressive age."

T. F. Melcher, General Manager of the Marion Brick Company, has taken up permanent residence in Indianapolis. His removal from Marion is a great loss to that city and a gain to the Hoosier capital, for Mr. Melcher is a power in business affairs and a prince of good fellows socially. The operation of the Marion company's new plant at Montezuma, Ind., in connection with the old works at Marion, make it necessary for them to establish a head office here. They have cozy quarters in the Lemcke Building, corner Pennsylvania and Market streets, where visitors will be welcomed by Mr. Melcher or his right bower, Frank W. Butterworth, who is also now a resident of the cleanest city on the globe.

EDITORIAL BRIEFS.

We are advised by the special commissioner of the United States for the Paris International Exposition of 1900 that it is advisable for all who desire to exhibit at the Exposition to write at once for application blanks. Those desiring space will please address John H. McGibbons, Times-Herald Building, Chicago.

Mr. F. E. Swift, Washington, Iowa, looked in on us recently. He complained of the Clay-Worker—said his little ad. was working him too hard. This is another way of saying that there is a large and growing demand for his kilns and furnaces, which are proving very satisfactory to all who have given them a trial. While here he closed contracts with the Sheridan Brick Works and the Marion Brick Company. The latter will build the Swift furnaces at their new plant at Montezuma, Ind.

Our readers will please observe that the Fate-Gunsaulus Company is no longer represented in our advertising pages, but instead is the firm of J. D. Fate & Co. (See page 387.) The latter company have succeeded to the business of the old firm, and will henceforth manufacture a full line of stiff clay machinery, brick and tileyard supplies. Mr. Fate is an old hand at the business, being one of Ohio's best known clay machinery manufacturers. Under his able direction the company is sure to keep well to the front of the procession.

The brickmakers of Cleveland, Ohio, and vicinity have finally organized a local association that bids fair to prove permanent. All the brick sold for delivery in the city are sold through one office or selling agency, which is under the direction of C. G. Barkwill, and it is hoped that a living price will be maintained in the future. During the past year or two brick have been sold for \$4, less than the actual cost of manufacture. Ex-President of the N. B. M. A., F. H. Eggers writes that the outlook for the coming season is very good indeed.

The New Orleans Progressive Union is the title of a new commercial organization instituted for the purpose of forwarding the business interests of the Crescent City. That a city so old and wealthy as New Orleans should inaugurate a move of this sort indicates a live up-to-date spirit that is surprising. The best and most commendable thing done so far by this new organization, to our mind, is the selection of J. A. Blaffer, the well-known brickmaker, as its Manager. Mr. Blaffer is a man of superior executive ability and splendid social qualities that will enable him to carry out the work of the Progressive Union very effectively.

The pottery of Jacob Bense, Pensauken, N. J., was damaged to the extent of \$3,000 by fire on the 12th inst. The origin of the fire is unknown, but is supposed to have started from the furnace.

James Blackstone, of Pittsburg, Pa., will establish a brick plant at Edinburg, Pa. The land for the works has been secured, and work on the plant will be pushed to completion as rapidly as possible.

Charles Wedeking, a well-known citizen of Evansville, Ind., died April 11th, after a lingering illness of nearly two years. Mr. Wedeking was a member of the brick manufacturing firm of E. Wedeking & Co.

The plant of the Darlington (Pa.) Brick and Mining Company was burned to the ground April 11th. The fire is said to have originated in the dry house. The loss is estimated at \$40,000, on which there is little insurance.

INTERESTING.

The paper comes; I read it through,
And all the household read it, too.
So bright it is, if tossed out-door,
The rain will o'er its columns pour;
Which proves, of course, right in a minute,
There's not a single dry page in it.

—[Exchange.

Do not despise the humble. Even a cabbage may have a great head, and we have often seen a sage cheese.—[Exchange.

TABLE OF CONTENTS.

| | | | |
|--|-----|---|-----|
| Testing Sewer Pipe in Melbourne, Victoria..... | 311 | makers..... | 356 |
| Modern American Front Brick Insurance, Fire and Adjustment..... | 312 | Burned Clay—Protection from Fire..... | 356 |
| Success..... | 314 | What's a Fair Royalty?..... | 358 |
| The Development of Hollow Block Manufacture..... | 315 | Notes From Tide-Water, Virginia—Death of R. M. Booker | 358 |
| Enameled and Glazed Brick.... | 319 | Brick Setting and Burning in Down-Draft or Up-Draft kilns | 358 |
| Brickyard Sketches—The Eastern Paving Brick Co..... | 321 | The New York Market..... | 360 |
| Hints on Brickmaking..... | 322 | Gaseous Fuel in Kilns, etc..... | 343 |
| Solution of the Labor Problem. | 323 | Brick Versus Wood Buildings.. | 343 |
| Minnesota's Pioneer Sewer-Pipe Factory..... | 326 | From the Brickyard to Legislative Halls..... | 343 |
| Button-Hole Talks..... | 327 | Hollow Block, Brick and Pipe Sewers..... | 343 |
| A New Brick Exchange..... | 327 | Glazed Brick..... | 344 |
| "Union" Brick Machines..... | 328 | May Want a Dry Press..... | 344 |
| In Philadelphia Brickyards—Murtha & Early's Molded Brick..... | 329 | Try Water..... | 344 |
| A Brick Factory in a Wooden Town..... | 330 | A Traveler's Notes..... | 344 |
| Jeffrey Steel Cable Conveyor for Slabs and Refuse..... | 330 | EDITORIAL: | |
| American Imports and Exports of Bricks and Clay..... | 331 | Current Comment..... | 345 |
| The Ohio Valley Clay Works Afloat..... | 331 | The Labor Problem..... | 345 |
| The Use and Abuse of Clay-working Machinery..... | 332 | Insurance on Fire-Proof Buildings..... | 346 |
| Convention Culls..... | 333 | An Arts and Crafts Exhibition. | 346 |
| Canadian Tariff on Clay Products..... | 338 | Trade Literature..... | 346 |
| Sight-Seeing Under Difficulties | 350 | Editorial Briefs..... | 347 |
| CORRESPONDENCE: | | Editorial Notes and Clippings. | 352 |
| CONVENTION ECHOES. | | MISCELLANY: | |
| What Does Your Brick Cost You? Brickmaker Know Thyself and Thy Neighbor Too..... | 342 | What is Electricity?..... | 320 |
| Pleasant Memories and Bright Anticipations..... | 342 | Good Tidings from Canada..... | 323 |
| Down in Jersey..... | 354 | Confidence and Prosperity again Doing Business in Iowa..... | 328 |
| With the Philadelphia Brick- | | Want T Rails and Dump Cars.. | 328 |
| | | A Combination Subscription... | 329 |
| | | History Repeats Itself..... | 331 |
| | | The Convention Profitable, even at Long Range..... | 333 |
| | | Desires the Co-operation of all Interested..... | 350 |
| | | Ye Mayden and Ye Knyghte... | 354 |
| | | It's Keeping Everlasting at it.. | 356 |
| | | Merchant Hubbard..... | 360 |
| | | Gratifying Trade Improvement | 360 |

Index to Advertisements on Next Page.

Books for...

Brickmakers.

| | | |
|-------------------------------|-------------------------|---------|
| "CLAY GLAZES AND ENAMELS," | Henry R. Griffen, C. E. | \$ 5.00 |
| "BRICKMAKER'S MANUAL," | Morrison and Reep, | 3.00 |
| "BRICKMAKING AND BURNING," | J. W. Crary, Sr., | 2.50 |
| "TABLE OF ANALYSES OF CLAYS," | Alfred Crossley, | 1.00 |
| "VITRIFIED PAVING BRICK," | H. A. Wheeler, E. M., | 1.00 |
| "PRACTICAL FARM DRAINAGE," | J. J. W. Billingsley, | 1.00 |

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

FOR SALE—A \$20,000 brick and tile factory, at Carlinville, Ill.; with inexhaustible hill of shale clay. For sale at \$5,000 on easy payments; or will rent for term of years. Free of rent this year, to proper parties.
45 p e CASH & LUCKEL, Galveston, Texas.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

| Name. | Page. | Name. | Page. |
|--------------------------------|-------|--------------------------------|----------|
| Progress Press Brick & Mach Co | 361 | Co..... | 304, 305 |
| Ross-Keller Brick Machine Co. | 309 | The American Clay-Working | |
| Simpson Brick Press Co | 307 | Machinery Co | 379, 382 |
| The Chisholm, Boyd & White | | The Fernholtz Brick Press Co.. | 306 |

Brick and Tile Machinery.

| | | | |
|-------------------------------|---------------|-------------------------------|----------|
| Anderson Foundry and Mach. | | Steele, J. C., & Son..... | 371 |
| Works..... | 378 | J. D. Fate & Co | 387 |
| Baird and Son, H. C..... | 370 | The Huettelman & Cramer Co... | 376 |
| Brewer, H. & Co | 389 | The American Clay-Working | |
| Carlin's Sons, Thomas | 376 | Machinery Co..... | 379, 382 |
| Central Machine Works | 383 | The Bonnot Co | 357 |
| Chambers Brothers Co..... | 301, 377 | The Horton Mfg Co | 380 |
| Chicago Brick Machinery Co... | 308 | The Eastern Machinery Co..... | 390 |
| Eagle Iron Works..... | 362 | The Henry Martin Brick Mach. | |
| Freese, E. M. & Co | 388 | Mfg. Co | 366, 386 |
| Frost Engine Co | 384 | The Leader Mfg. Co..... | 377 |
| Hensley, J. W..... | 303 | The Ohio Ceramic Engineering | |
| Kells & Sons | 370 | Co | 302 |
| Means & Co., Jas..... | 367 | The Wallace Mfg. Co..... | 359, 391 |
| Madden & Co..... | 369 | The Wellington Machine Co | 353, 355 |
| Murray & Welch | 366 | Williams Patent Crusher and | |
| Potts & Co., C. & A..... | 302, 348, 381 | Pulverizer Co | 361 |
| Raymond & Co., C. W..... | 349, 351 | Wiles Co., A. M. & W. H | 371 |
| Stedman's Machine Works..... | 371 | Woolley Foundry and Machine | |
| | | Works | 385 |

Brick Kilns and Dryers.

| | | | |
|----------------------------|-----|--------------------------------|-----|
| Alsip, S. H | 372 | Phillips, S. G..... | 370 |
| Carson, J. W..... | 364 | Reppell, L. H | 372 |
| Endaly, W. A | 374 | Swift, F. E..... | 367 |
| Haigh, H..... | 373 | The American Blower Co..... | 392 |
| Kaul, C. F..... | 366 | The Fernholtz Brick Press Co.. | 306 |
| Lehmann & Co, F..... | 373 | The Standard Dry Kiln Co..... | 310 |
| Morrison & Co., R. B | 374 | Wolf Dryer Co..... | 392 |
| Pike, E. M..... | 365 | Yates, Alfred..... | 365 |

Brick Yard Supplies.

| | | | |
|-------------------------------|-----|--------------------------------|----------|
| Arnold, D. J. C..... | 378 | Phillips & McLaren | 367 |
| Coldewe & Co., G..... | 367 | The Atlas Bolt & Screw Co..... | 375 |
| Carnell, Geo..... | 372 | The Harrington & King Perfor- | |
| Caldwell & Son Co., H. W..... | 368 | ating Co | 303 |
| Carmichael, T. W..... | 367 | The Henry Martin Brick Ma- | |
| Elder & Dunlap..... | 364 | chine Mfg. Co | 366, 386 |
| Marion Steam Shovel Co..... | 375 | The Horton Mfg. Co..... | 380 |
| Mey, F. H. C..... | 365 | The Pittsburg Mineral Screen | |
| Mershon & Co., W. B | 362 | Company..... | 365 |
| Newton, A. H..... | 369 | | |

Miscellaneous.

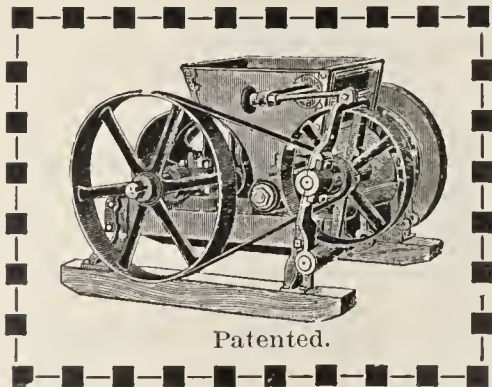
| | | | |
|---------------------------------|-----|------------------------------------|-----|
| Associated Trade & Industrial | | Indianapolis Engraving and | |
| Press | 367 | Electro Co..... | 368 |
| Bennett & Sayer..... | 363 | Indianapolis School of Medi- | |
| Big Four R. R..... | 369 | cine..... | 366 |
| Cincinnati, Hamilton & Day- | | Indiana, Decatur & Western ... | 370 |
| ton R. R | 368 | Illinois Central R. R | 370 |
| Chesapeake & Ohio R. R..... | 369 | Lake Erie & Western..... | 369 |
| Cotton Belt Route..... | 369 | Leali, Charles..... | 363 |
| Dean Bros. Steam Pump Works | 363 | Main Belting Co | 368 |
| Dover Fire Brick Co..... | 368 | Monon Route | 368 |
| Evens & Howard | 364 | Osborne, W. R..... | 365 |
| Gabriel & Schall..... | 365 | Sorge, A. Jr..... | 366 |
| Geysbeek, S..... | 366 | Tennille, A. F..... | 364 |
| International Correspondence | | The Jeffrey Manufacturing Co.. | 369 |
| Schools | 366 | The Rockwood Mfg. Co | 368 |
| Indianapolis College of Law ... | 364 | Vandalia Line | 370 |
| | | Small Ads., Wanted, For Sale, etc. | |

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The Potts Disintegrators

Simple in Construction, Strong and Durable.

Work any clay direct from bank. They will not choke or clog. They grind the small stone and separate the large ones.



Milledgeville, Ga., November 4, 1897.

C. & A. POTTS & CO., Indianapolis, Ind.

Gentlemen:—For ten year I used one of your old style Disintegrators, it did good work early this year I had it changed to the way you now make them and it is simply perfect. My son uses one of your Disintegrators and without it he could not make first-class brick out of the clay he has to use. Every brickmaker who has hard clay to work should put in one of your Disintegrators, it does all you claim for it.

Wishing you much success I am

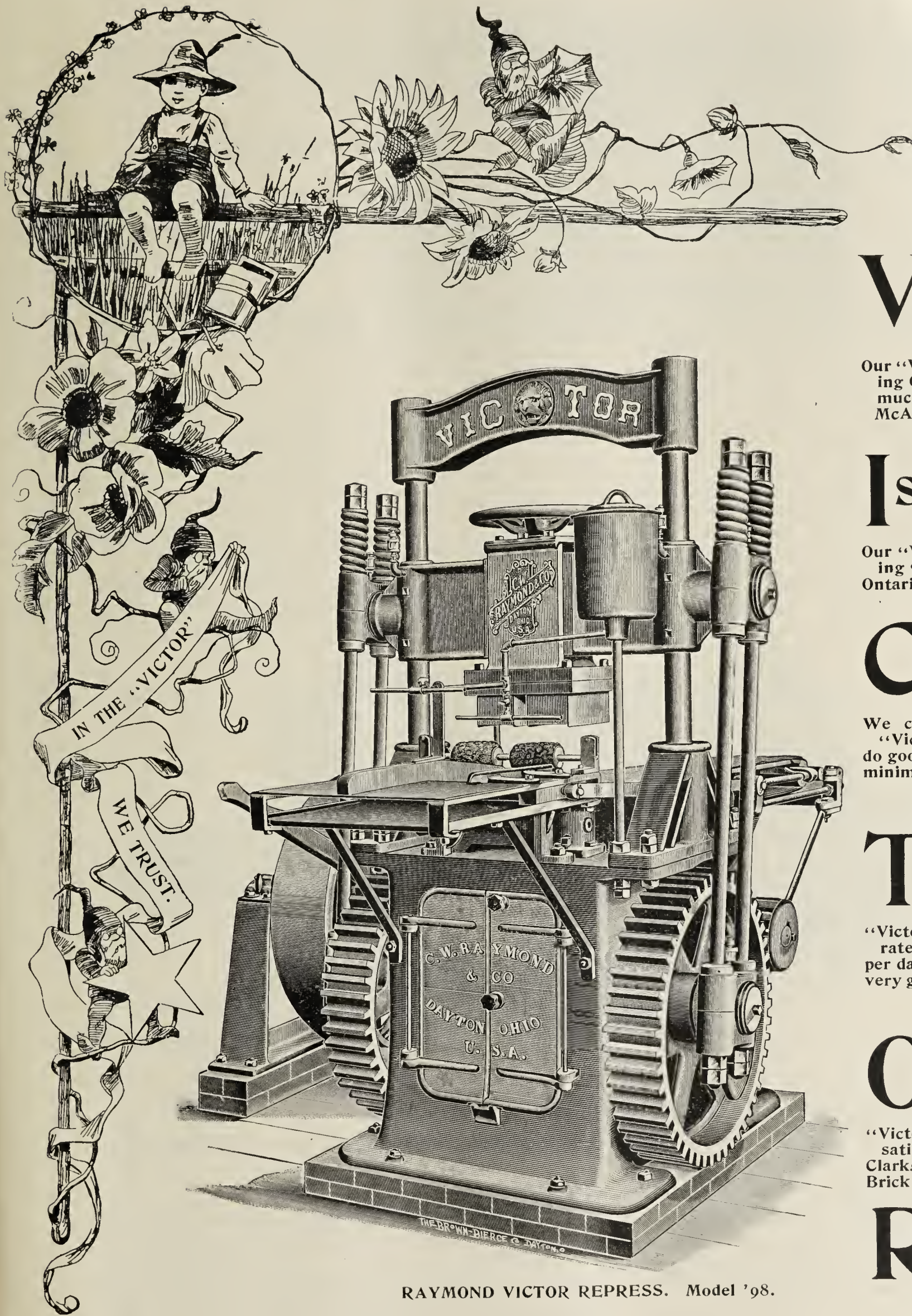
Yours truly,

J. W. McMILLAN.

We manufacture 12 sizes of Disintegrators and can furnish any size promptly. We guarantee them to do as claimed or no sale.

Write for prices and terms.

C. & A. POTTS & CO., Indianapolis, Ind.



RAYMOND VICTOR REPRESS. Model '98.

Victor

Our "Victor" Re-press is working O. K. and we like it very much.

McAvoy Vitrified Brick Co.,
Perkiomen Junction, Pa.

Is....

Our "Victor" Re-press is working "out of sight."

Ontario Paving Brick Co., Ltd.
Toronto, Canada.

Certainly

We congratulate you on the "Victor" Re-presses. They do good work and require but a minimum amount of repairs.

Mack Mfg. Co.,
New Cumberland, W. Va.

The

"Victor" Press running at the rate of 28,000 to 30,000 brick per day. I must say that I am very greatly pleased at its work.

T. W. Carmichael,
Lazearville, W. Va.

Only

"Victor" Press working very satisfactory.

Clarksburg High Grade Shale Brick Co., Clarksburg, W. Va.

Re=Press.

C. W. Raymond & Co., Dayton, Ohio, U. S. A.

SIGHT-SEEING UNDER DIFFICULTIES.

Prof. Edward Orton, Jr., and His Clayworking Class Visit the Clay Mines and Factories of the Hocking Valley.

THE FOURTH OF APRIL was a very disagreeable day, a cold, heavy rain having fallen during the previous week. In the morning, the day looked rather dubious for a trip down the Hocking valley, especially as the angry floods were still swelling the creeks and rivers. But rain and floods cannot daunt the audacity of our Professor so long as there is a possibility of carrying out an object previously planned.

It was our spring vacation time—that very short and generally little enjoyed rest between the winter and spring terms—and to get out among the hills and dales for those two days had been a pleasant anticipation of the class members for some time, so that it was a jolly and happy party that started down the valley that disagreeable morning.

Along in the middle of the forenoon, by special favor, the train was slowed up nearly a mile north of Nelsonville at the Nelsonville Sewer Pipe Company's plant. Mr. James Dew, the Superintendent, was not to be found, and having only two hours in which to look over the plant, we at once started to see it the best we could without a guide.

In order to see and understand the full working of the plant we took the different parts of the plant in their regular sequence, beginning at the clay mines. Very fortunately for us, most of whom had never been in a mine before, Prof. Orton is perfectly familiar with mines, and as we walked through the mines we had many details of mine-working pointed out and explained which would have otherwise escaped our notice. He explained to us the way the mines are planned and worked, how they are ventilated, and many other important points.

After having spent some time in the mine we started once more for fresh air and sunlight. As we emerged out into daylight, and the green valleys and hills could be seen once more, a feeling of relief came over us all, disagreeable as it was outside. Approaching the factory, we were met by the foreman, who kindly offered to guide us through the rest of the plant. They now make brick most altogether, but originally the plant was planned for a sewer-pipe factory. The whole plant, including the dryer and kiln yard and mine, is arranged in a compact whole, each successive stage of the process being in a systematic order in relation to each other.

After having examined the plant as carefully as possible in the limited time we had, we started on foot for Nelsonville, nearly a mile down the track. As a hotel dinner was out of the question, we hurried about the town in search of a restaurant. It was found, and those very few minutes that we had before train time were put in in satisfying the aching void of which all of us complained. It did seem as though we could not be filled, and to insure ourselves against losing the train and yet satisfying our hunger, we bought an extra supply and carried away in our hands and pockets what we could not swallow then and there.

On leaving Nelsonville we went to Haydenville, and there visited the Haydenville Mining and Manufacturing Company. We were met by the Manager, Mr. J. W. Jones, and were given a hearty welcome. He expressed the regret that he could not show us through his plant in person, but he did the next best thing by throwing wide open its doors.

Here we also started our study at the mines. Our trip to the mine proved to be an extremely novel and interesting experience. We had arrived at the plant just before the company's switch engine was to return the empty cars to the mines, some two miles back among the hills, so Mr. Jones hailed the engineer and into the forward "dump" we boys climbed, while the Professor took the seat of honor in the cab. I have often regretted that we could not have had a picture of us all sitting on the edge of that little car trying to keep the drenching rain off, and at the same time finishing our dinner on the installment plan. We must have presented a ludicrous sight, but I am sure that the few who did see us did not consider it nearly so ludicrous as we did ourselves.

After reaching the clay mine we had the good fortune of being able to ride into the mine with the "hauler." He took us into the rooms where they were working, and there we saw how they drilled and worked the face of the rooms. After having seen everything of note at the mines, we started down the track afoot towards the plant, the Professor explaining the geological

formation of the coal fields and their accompanying clay beds, over which we passed.

The railroad runs beneath a high ridge through a tunnel, and but a few minutes before we entered this tunnel the engine had passed through, filling it full of smoke. As we groped along through the darkest of darkness, breathing the sulphurous air, we had great difficulty in keeping on the track out of the water. It was not until we, having hold of each other's coat tails, guided by the Professor, who, by continually tapping the rail with his umbrella, kept us onto the track, could we keep from stepping into all of the mud holes and stumbling over all of the ties. As is usual under the most unpleasant circumstances, wit had full sway, and many a merry laugh resounded through that dark tunnel, caused by some pert Southern expression from our Virginian member.

At the factory we followed the clay from the dry pans to the kilns, studying the methods of manufacturing and comparing them to the other we had seen at Nelsonville. The afternoon flew by all too quickly, and ere we had gone over the whole plant it was train time.

That night we spent at the Depot Hotel, located in the Logan depot. By the surprised looks that came over our faces the next morning when we were told that four or five trains, most of which were freight, had passed directly under our windows during the night, it could be easily seen that we had slept very soundly.

After an early breakfast we took the train for Union Furnace, some six or seven miles south of Logan, where the Columbus Brick and Terra Cotta Company's works are situated. There we spent the most of the forenoon studying the plant and the geological deposits of coal and clay in the valley. Mr. E. E. Lovejoy, the Superintendent, roamed with us over the hills, pointing out points of outcrop of the different coal and clay beds.

This part of the trip was the most enjoyable, for the clouds which had hung over us for many a day had cleared away and the welcome sun was shedding its brightening soft rays upon the earth, giving new life to the grass of the meadows and to the trees of the woods which bedecked the hills about us. Everything seemed to be glistening with new life, and it was natural that we, too, should imbibe some of that invigorating and enlivening life from the fresh air and sunshine.

At noon we took a return train for Logan, where we satisfied our sharpened appetites. After dinner we sauntered through the town over to Rempel, Sneider & Co.'s brickyard. They were not running, but the Superintendent took us over the plant. The arrangement of the kiln yard and a large artificial dryer were the points of greatest interest here. The dryer was six tracks wide and five cars long, heated by exhaust steam from the engines.

From this plant we walked down the railroad to the Hocking Clay Company's works. Between the "Weary Willie" and a hog train we found ample studies with which to sketch into our witticisms and banterings many a ludicrous picture of each other. Between the times of serious reflections at the different yards we never failed to give full vent to our revigorated spirits.

At the Hocking Clay Company's, the Manager, Mr. Magoon, had in store for us a most pleasing novelty in the line of salt-glaze bricks. They are getting some of the most beautiful effects with the salt-glaze, which are winning for the bricks a rapidly growing market.

Besides his salt-glaze wares, which were of very great interest, Mr. Magoon showed us many a mechanical device which was designed and put into use by himself. Mr. Magoon is a mechanic of the highest order, as these little contrivances testified.

We returned home at Columbus late that evening, tired, but more than pleased with our two days' trip among the clay works of the Hocking valley.

A STUDENT.

DESIRES THE CO-OPERATION OF ALL INTERESTED.

T. A. Randall, Esq.:

Dear Sir—As one of the committee to collect facts showing the advantages of clay production over other material in the construction of buildings, I ask that you request, through your paper, all brick, terra cotta and tile producers or any others interested in this subject to make it a special study, and talk with brick manufacturers, builders and architects at every possible opportunity, and report all ideas obtained to this committee as soon as convenient. We believe the field is vast and the harvest can be great, but it needs earnest, hard work on the part of every man interested in any clay production. If the same enthusiasm, courage and good will is manifested that was shown at the Pittsburg Convention, success will crown all our labors.

Syracuse, N. Y. February 28th.

C. H. MERRICK.

A NAKED PROPOSITION

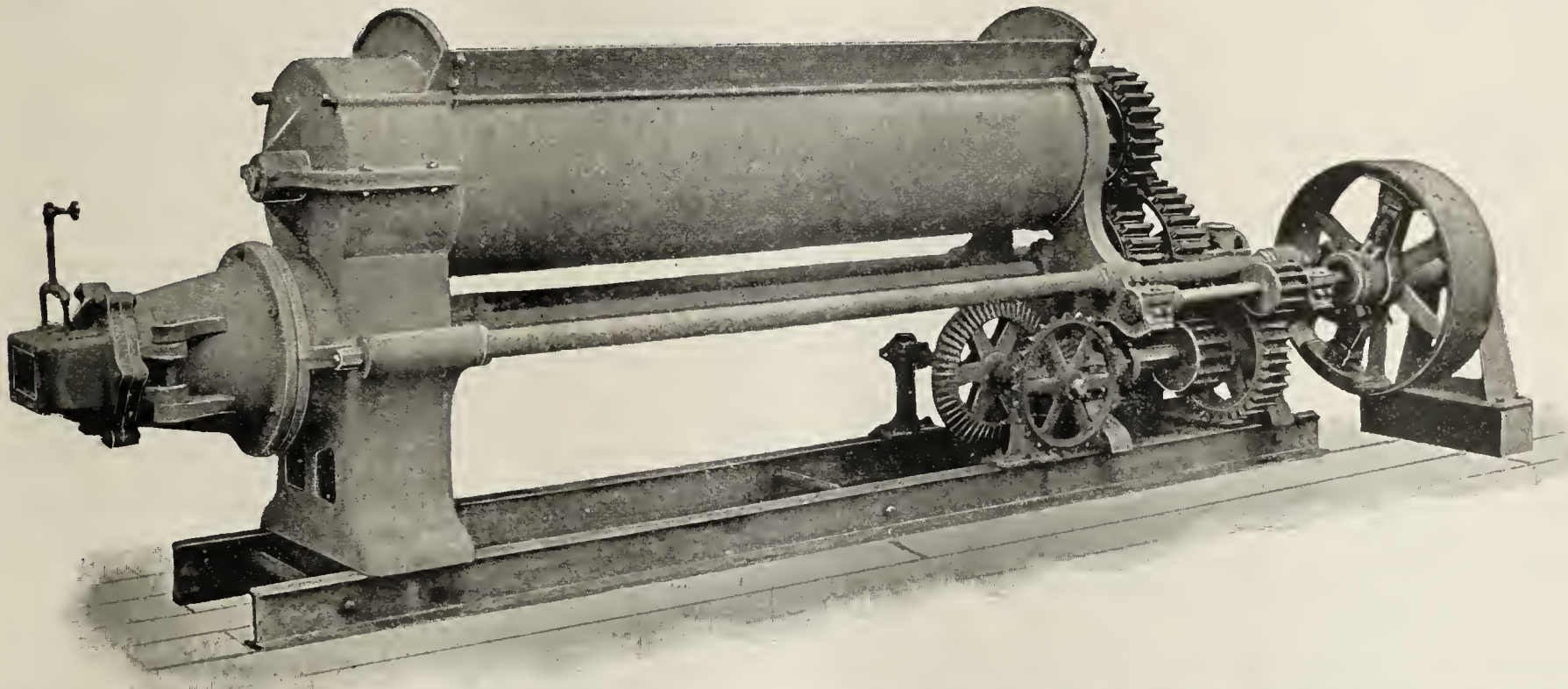


*Unadorned with -
Gilded Sophistry
or Seductive - - -
Fabrication - - -*

It is a fact that compound gearing is superior in every respect to single gearing. Single gearing requires more power to operate. It wears out more quickly. It is much harder on the machine. In short, it is but a weak attempt by cheap machine manufactures to make one gear and one pinion do the work that should be done by two gears and two pinions, in order to reduce the cost, thereby giving them larger profits. You can not afford a single-gear brick machine at any price.

The Raymond No. 2 Compound-Geared Combined Brick Machine is operated by four massive gears and two heavy pinions, which form the mechanical equivalent of an independent Compound-Geared Pug Mill and a Compound-Geared Brick Machine. It also has many other points of excellence that you can not afford to ignore. For instance: Its main shafts are 3½ inches hexagon hammered steel and the others are proportionally heavy. The die has a hinged front and is fitted with our improved scale liners for steam, oil, or water lubrication. It is bolted down on channel iron I beams instead of wooden skids—making it more rigid and strong. These I beams do not warp or twist and throw the machine out of line as wooden ones do when subject to brick yard use. The Pug Mill is 9 feet long. Its estimated weight is 12,000 lbs. and has a capacity of from 25,000 to 40,000 bricks per day.

In short, in this article we have endeavored to elevate the Combined Machine from the class generally known as cheap where it has been placed, to that of the high finished, durable, easy running, high grade, first class Brick Machine and it is to you, our patrons, to whom we turn for the success or failure of our efforts.

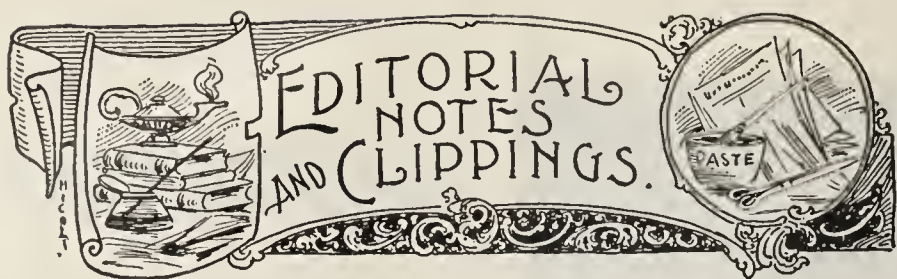


Raymond No. 2

Compound-Geared Combined Machine.

The Automatic Board Delivery Cutting Table will interest you.

C. W. RAYMOND & CO.
DAYTON, OHIO.



David Mullen will start a brickyard at Warren, Ohio.

The Raleigh (N. C.) Brick Company has been incorporated.

H. W. Barber and F. Daugherty will start a brickyard at Concordia, Kan.

A. Shepherd, of Monroe, Ia., contemplates starting a brickyard at Swan, Ia.

F. Muller and S. Dorman have established a brick plant at Nacogdoches, Texas.

Greer Machinery Company, of Knoxville, Tenn., is in the market for a second-hand brick machine.

The Annville Brick Company has secured a location at Annville, Pa., where they will establish a brick plant.

A brickyard is wanted at Guide Rock, Neb. The town will give a site to anyone who will establish a plant there.

C. O. Evans, Detroit, Mich., 485 Thirteenth street, wants to purchase a small brick and tile plant ready for operation.

Luis Parra will establish a brick plant at Chihuahua, Mexico. He expects to invest \$30,000 on the plant and its equipment.

Edward Cnsens has purchased the brickyard of Gibson & Co., at Richmond, Va., and will operate same the coming season.

G. Tuberg and J. Kollman have formed a partnership for the purpose of manufacturing brick the coming season at Mankato, Minn.

The Kansas City (Mo.) Paving Brick and Tile Company has been incorporated by W. H. Lucas and others, with a capital stock of \$20,000.

A. M. Bennett, of Bellaire, Ohio, contemplates establishing a brickyard at Charlevoix, Mich., where he has discovered a large deposit of good clay.

Joseph Winston, the oldest brick contractor and manufacturer in Huntsville, Ala., died at the home of his daughter in Birmingham, Ala., April 4th.

David Urquhart has purchased the brick plant at Moscow, Idaho, formerly owned by Taylor & Landier, and will put same in shape to operate at once.

A large deposit of valuable clay has been found at Saint Leo, Pasco county, Florida, and arrangements to establish an immense brick works are being made.

W. T. Thurmond, of Harmony Grove, Ga., has leased the Hardman brickyard, near Athens, and is now making preparations to manufacture brick on a large scale.

One of the largest gas wells ever struck in Ohio was recently opened by the Athens (Ohio) Brick Company on their property. The company will utilize the gas for fuel.

The Tennessee River Brick Company has been incorporated at Decatur, Ala. The incorporators are N. M. Pride, A. W. Sharply and B. M. Nelson. Capital stock is \$25,000.

Plans have been made for the reorganization of the Blair Brick Company at Cincinnati, Ohio. Capt. J. M. Blair has been operating the plants since their assignment last month.

The Newton Lumber Company, of Colorado Springs, Colo., expect to open up a brickyard at that place this spring. They say they expect to turn out 3,000,000 brick this summer.

James A. Benner has purchased the brickyard formerly owned by J. S. Allam at Salisbury, Pa. The yard is being put in shape, and the manufacture of brick will commence at once.

Moses Stanton, an old resident of Englewood, Ill., expired very suddenly April 8th. Mr. Stanton was seventy-four years old and had lived in Englewood for thirty years, where he owned an extensive brickyard.

After a short illness, Thomas Hogan, a well-known resident of Galesburg, Ill., passed away March 26th. He had lived in Galesburg thirty years, all of which time he had been engaged in the manufacture of brick and tile.

The partnership of Anton Stiel, Adam Spangler, John Reniel and Solon Brown, doing business under the firm name of the Jefferson (Wis.) Brick and Tile Manufacturing Company, has been dissolved, Mr. Brown retiring. The remaining members

have reorganized the company as the Jefferson Brick and Tile Company, with A. Spangler President, J. Reniel Vice-President and A. Stiel Secretary and Treasurer.

Thomas Hampton, a laborer employed at the works of the Ottumwa (Iowa) Brick and Construction Company, was crushed under falling shale and almost instantly killed March 23d. Another employe was badly injured.

The large brickyard of Klose & Polenski, at Hastings, Neb., which has been idle for some time, has started up, with more men employed than for several years. There is a great demand for brick in and around Hastings.

The Moore County Brick Company has been incorporated by P. A. Stebbins, D. W. Thomas, P. H. Beck and J. C. Stanly, to manufacture brick at Southern Pines, N. C. Mr. Beck is the only Southern man in the enterprise.

The Marion (Ohio) Steam Shovel Company say they are working their shops to full capacity, and are considerably behind orders. They have recently shipped steam shovel equipment to William Fisher & Co., Sayreville, N. J.

Enoch E. French, Secretary and Treasurer of the Jamieson-French Fire Clay Company, St. Louis, Mo., died April 1st. He was one of the founders of the firm, which has been in business many years. A widow and one son survive him.

Mathias Stipp, of Scranton, Pa., has purchased the Morgan brickyard at Lee Park, Pa. Mr. Stipp will overhaul the plant and install modern machinery and appliances. In addition to this plant, Mr. Stipp is running two large plants at Scranton.

The case of John Porter, the brick manufacturer, versus John M. Mack and G. B. Borne for \$50,000 damages for alleged conspiracy to destroy plaintiff's business and injure his credit will come up for trial at New Cumberland, W. Va., at the present term of court.

The Brockway Brick Company has been chartered at Fishkill Landing, N. Y., with \$20,000 capital stock. The new company will run the George W. Smith yard at Dutchess Junction, N. Y., where they will put in two new machines, increasing the capacity to 100,000 per day.

The death of James H. Hamilton occurred March 29th at his home in Philadelphia, Pa. Mr. Hamilton was about forty-three years old, and was engaged in the brick business, being a member of the Philadelphia Brick Manufacturing Company. He leaves a widow and three children.

Notice has been received of the dissolution of the partnership heretofore existing between George Lant, Sr., and Cave J. Morris, known as the Evansville Pressed Brick Company, of Evansville, Ind., Mr. Morris retiring. The business will hereafter be conducted under the same name by George Lant, Sr.

In renewing their subscription, Morgantown (W. Va.) Brick Company say they contemplate putting in a complete new plant for the manufacture of paving and ornamental brick, and perhaps, after a time, adding stoneware, clay shingles, etc., and add that they do not care for catalogues, as they already have a pretty good idea of what they want.

G. H. Wilson, Sulphur Springs, Texas, in a recent letter renewing his subscription, says he is making improvements in his plant, putting in a new four-mold Boyd dry press. Mr. Wilson says demand for brick in his vicinity is good and prices fair, ranging from \$5 per thousand for common side-cut builders to \$20 per thousand for buff mottled face brick.

The brick manufacturers in the vicinity of Dover, N. H., have formed an association to be known as the Piscataqua Brick Manufacturers' Association, with C. H. Seavey President, D. L. Pinkham Vice-President, E. O. Pinkham Secretary, and F. H. Roberts Treasurer. The object of the organization is to control freight rates to and from Boston.

Hoover & Flory, brick manufacturers, LaPorte, Ind., would like to receive information in regard to arranging a yard with a view of applying artificial heat to common soft mud drying racks. They say they have enough racks, holding 216 brick to the section, to dry 160,000 brick, but find they need enough more to hold 100,000 more, and would prefer to apply artificial heat to at least a part of the racks, if it can be done without any great expense. Any of our readers having had experience along this line will confer a favor on our Hoosier friends by giving them their views, either direct or through our columns.

We are in receipt of a letter from J. H. Scott, President of the Indian University at Bacone, Ind. Ter., in which he says that place offers a splendid location for a brick and tile factory. He states they have an abundance of good clay suitable for common building brick, vitrified paving brick and sewer pipe. In addition to this, they have an almost inexhaustible supply of fuel in the form of oil and gas. In closing he says: "I regard

[CONTINUED ON PAGE 354.]

Didn't You Know It?

Use of improved Automatic Machinery has enabled a reduction in the price of Brick Moulds, at the same time improving quality of manufacture.

L **REGULAR MACHINE MOULDS**, the heretofore standard grade in quality, \$1.75 each
O **"SPECIAL" MACHINE MOULDS.** An improvement. Selected hard cherry; bound with heavier steel; larger, longer and more screws; screws
O in bottom of partitions. We recommend their use, - - - \$2.00 each
K **EXTRA**, (per mould.) Steel lined at ends, 25 cents. Panels 25 cents. Crimped bottom irons 15 cents.

Let us make you a trial proposition for one of our "Wellington" Mould Sanding Machines. Its simple and perfect, and the price—that is what will astonish and please you.

**AN EYE
OPENER**

The "Iron Quaker" Machines

For 1898 are **BETTER
THAN EVER.**

This cut shows the steam power in connection with our Mould Sander.

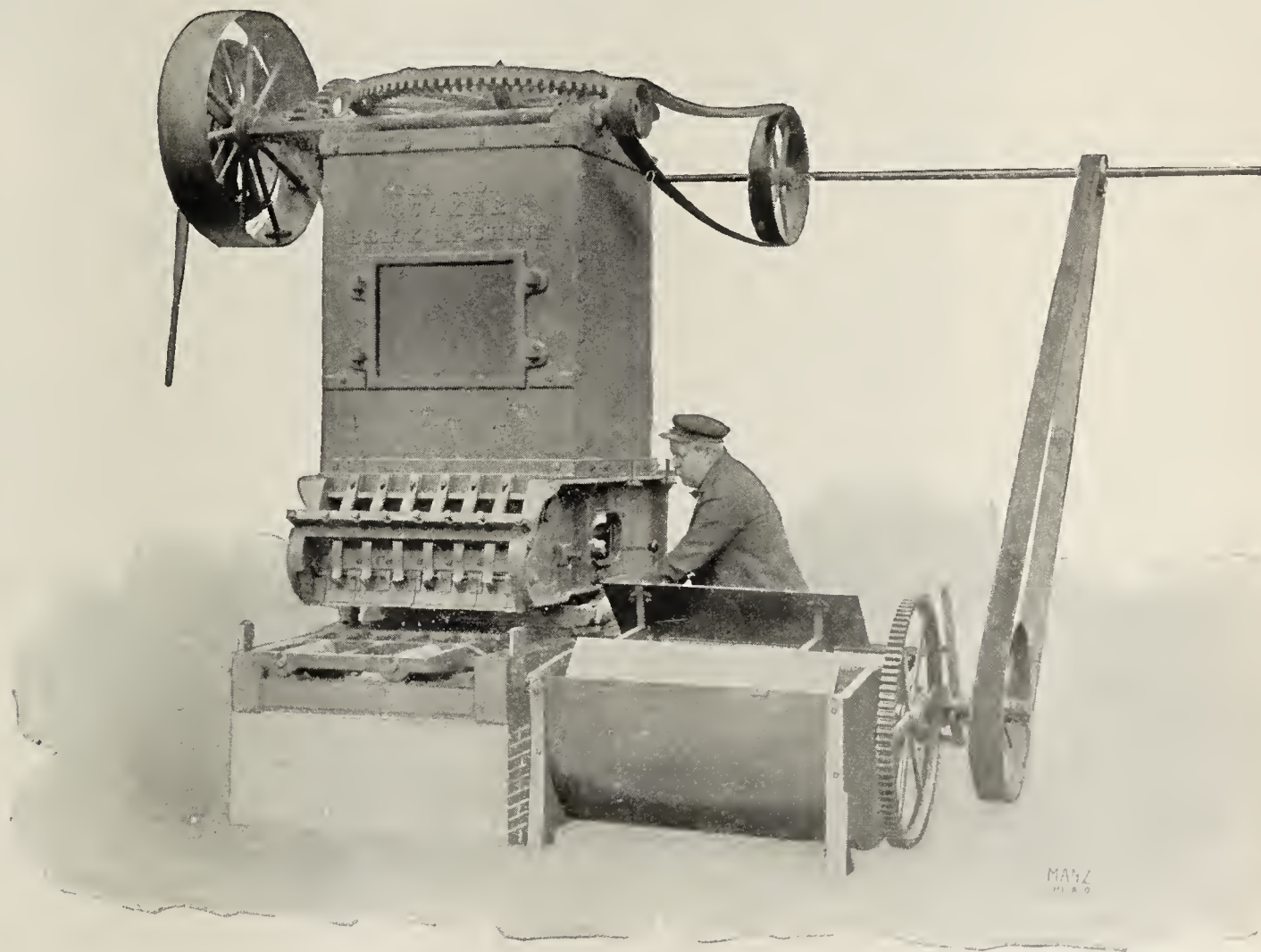
Our Horse- Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE: At Bargain Prices.

Odd sizes of moulds. Have not been used.

20 moulds, 8 13-16 x 4 3-16 x 2 7-16. 9-16 in. partitions.
17 hand moulds (3's) standard size.

Second-hand, but used a few days only.

10 moulds, 9 1/2 x 4 9-16 x 2 3/4. 1/2 inch partitions.
19 moulds, 9 1/2 x 4 5/8 x 2 9-16. " " "
16 moulds 9 1/4 x 4 1/2 x 2 3/4. 9-16 inch partitions.
6 moulds 9 x 4 1/2 x 2 1/2. 9-16 inch partitions.
10 moulds, standard size.
19 moulds, 9 x 4 3/8 x 2 1/2.

**The Wellington
Machine Co.,
WELLINGTON,
OHIO.**

Send
for
Circular.

See ad. on page 355.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

the present and prospective outlook for the sale of brick in Indian Territory as extremely flattering. I am in a position to know that extensive building operations are projected. The Territory is growing rapidly, and I have no doubt but that a good company would soon be able to work up a fine business. I will be very glad indeed to correspond with anyone desiring any information regarding this matter."

J. C. Steele & Sons, manufacturers of the "New South" brick machinery, Statesville, N. C., report that they are very busy. They have increased their force and are having all they can do to keep up with their orders. They have recently shipped more than a dozen machines to the Southern States. With nearly all of the orders they furnished automatic tables.

Joseph Pine, one of Galesburg's oldest and most respected citizens, and President of the Galesburg (Ill.) Brick and Terra Cotta Company, died at his residence in that city early in the month. Mr. Pine had been connected with the various business enterprises of Galesburg for a score of years, but since 1884 has been identified with the above company. A local paper, in commenting on his death, says: "Mr. Pine was a true, honorable man in his business. He never tried to take advantage of a person, but all his dealings were on the line of justice. He was sagacious in his transactions, and proved a successful business man."

The Atlas Bolt and Screw Company, of Cleveland, Ohio, report large sales of dryer cars, especially their new all-steel car No. 126, shown elsewhere in this month's Clay-Worker. Brick-makers commence to realize the fact that a steel car is a permanent investment, requiring no repairs, and less damage in case of fire. The steel decks are a particular boon to the economist in brick manufacture, as they need no carpenter to watch them when they come out of the dryer. They have recently gotten up a circular or display sheet, which is full of information on the dryer car question, showing a full line of dryer and clay cars, with complete description of each. If the dryer car subject is puzzling you, write them for one, free for the asking. It may help you to solve a question, and in the end save you money.

DOWN IN JERSEY.

Editor Clay-Worker:

Trade is moving along smoothly in the brick and terra cotta line here in Jersey.

At Perth Amboy all the factories are doing more or less work in this line. The hollow brick and fire-proofing companies are, we believe, the busier.

The Perth Amboy Terra Cotta Company is working more men than for a long time. This plant has never employed as many men since the strike there several years ago as they did previously. Perhaps there are more competitors in the business now than formerly.

The Standard Terra Cotta Works are doing more than ever. We note another story on their main pressing room, and other additions.

Mr. Marcus Schantz has resigned his position with the C. Pardee Works, and is laying on his oars at present. The above plant is still running on hollow brick, etc.

Of all the clayworking industries in Perth Amboy, the Standard Fire-proofing Company, of which Robert Lyle is manager, is probably the busiest concern. During a brief visit to this plant recently we note a complete change of boilers, engines and kilns, to such an extent that we could hardly find our way through the vast works. A recent new department in this factory is the manufacture of stationary wash tubs. A shipment of 700 was made recently. As this is somewhat of a new venture in this part of Jersey, 'tis interesting to watch results. We have always expressed the opinion that we do not manufacture enough of a variety of clay goods to make a humming industry of Perth Amboy. Wherever a town sticks to one line strictly you will find that town dead at times. The consumption of water at Mr. Lyle's place is increasing so fast that recently he contracted with the writer to increase supply by sinking three wells. This will be done at once, as they are now compelled to pump all night to get enough water to run machinery through the day.

At the Raritan Hollow and Porous Brick Company's plant everything is moving along on nine hours' time, and shipments are heavy. This firm usually have their share of trade at all times. They have recently installed a complete fire plant at their works, consisting of a steam fire pump, pipes and water plugs, ready for instant use. This was erected under the super-

vision of two sons of Mr. J. C. Rossi, the manager. These young men bid fair to make their mark in the world of civil engineering.

Mr. Henry Maurer is just finishing a beautiful school building at Maurer, to be given to the city when completed. This building is to replace the old No. 3 school, which is now too small to accommodate the fast-growing suburb of Maurer. All the material except the iron and steel in this new building has been made at Mr. Maurer's factory, near by, and is a revelation to the people of Perth Amboy. The outer walls are of eight-inch hollow brick, corners and windows being trimmed with old gold brick. The floors are of hollow fire-proofing, with small openings across the floor for steam heating pipes. Over this will be laid tile for floors, doing away with wood floors. The only wood in the building will be the window frames and doors. The roofing tile are also from Mr. Maurer's works, and make a beautiful finish. This building will be an ornament to the city and a credit to the donor.

The Staten Island Terra Cotta Clay Company has not arranged its financial difficulties to suit all parties as yet, consequently the largest portion of this plant is idle.

Mr. Phillip Gibson, of Perth Amboy, has at last taken up the manufacture of brick again, after a rest of about two years. Mr. Gibson has bought a half interest in a plant near Vine-land, N. J., and is now there getting the plant in shape for immediate work. With the vast experience of Mr. Gibson in the business, we predict a success, and this is something he deserves, for a lifetime spent working for others and a record that few have in the manufacture of fancy brick surely deserves its reward. Mr. Gibson is, without doubt, the first man who introduced the mottled or Pompeian brick now so much the rage.

The Guggenheim Smelting Works, of Perth Amboy, are just now the consumers of several million common brick, used in enlarging their copper refining plant to double its former capacity, also in erecting some very high brick stacks to carry the fumes from the lead refinery above the neighborhood. One of these stacks is 14 feet in diameter and 165 feet high.

There is considerable building going on in the city, but as this is a wooden city the number of brick consumed is comparatively small. Winter has lingered in the lap of spring this year. On the 5th we had four or five inches of snow.

A trip last week to Cleveland and Pittsburg on the fly, as it were, convinced the writer that while both of these cities are hives of industry, there is too much smoke to suit an Eastern man. We believe now that nothing under the sun could induce the writer to desire to return to that part of the world to reside permanently. We notice many fine buildings in the Smoky City since our last visit there, six or seven years ago, and as most of these buildings are of a better quality of brick than formerly used there, it makes quite an improvement in the appearance of the streets.

Common brick are rather stiff in price here, as is usual at this time of the year. We suppose that with good weather the yards will start upon their usual grind to see who can get the most brick out before snow flies again.

We note in recent Clay-Worker a clipping regarding the queer antics of an artesian well in the West. This being in my particular line, I can explain the trouble, I believe, satisfactorily. The water being found in a bed of sand beneath the clay, and the water flowing so strongly, no doubt the water flowed out so much sand that it left a cavity beneath the clay. The latter in time dropped down, and the rush of water forced the clay into the pipe and to the surface. This happened to a small well the writer sunk at the Enameled Brick Works at South River, several years ago, and to several others to my knowledge in New Jersey.

We must congratulate you and the members of the N. B. M. A. upon the success of your last meeting, as per report in Clay-Worker. Certainly nothing will be lost by continuing these yearly meetings.

W. R. O.

Perth Amboy, N. J., April 8, 1898.

It is estimated that the world spends \$2,000,000,000 a year on advertising. If advertising is worth anything—and every successful business man says that it is—then care should be given to its preparation, just as much as to the management of any other part of business.

YE MAYDEN AND YE KNYGHTE.

Ye mayde was yonge and passyng fayre,
Olde was the Knyghte, yet debonaire,
Quo' he, "Swete damosel, wilt thou wedde?"
"What! Be an olde manne's bryde!" she said.
"Nay; prithee, sir, canst thou descrie
Aught that is grene within mine eie?
Wedde thou a widowe, and be wise;
How shalt thou find one!—Advertise!"

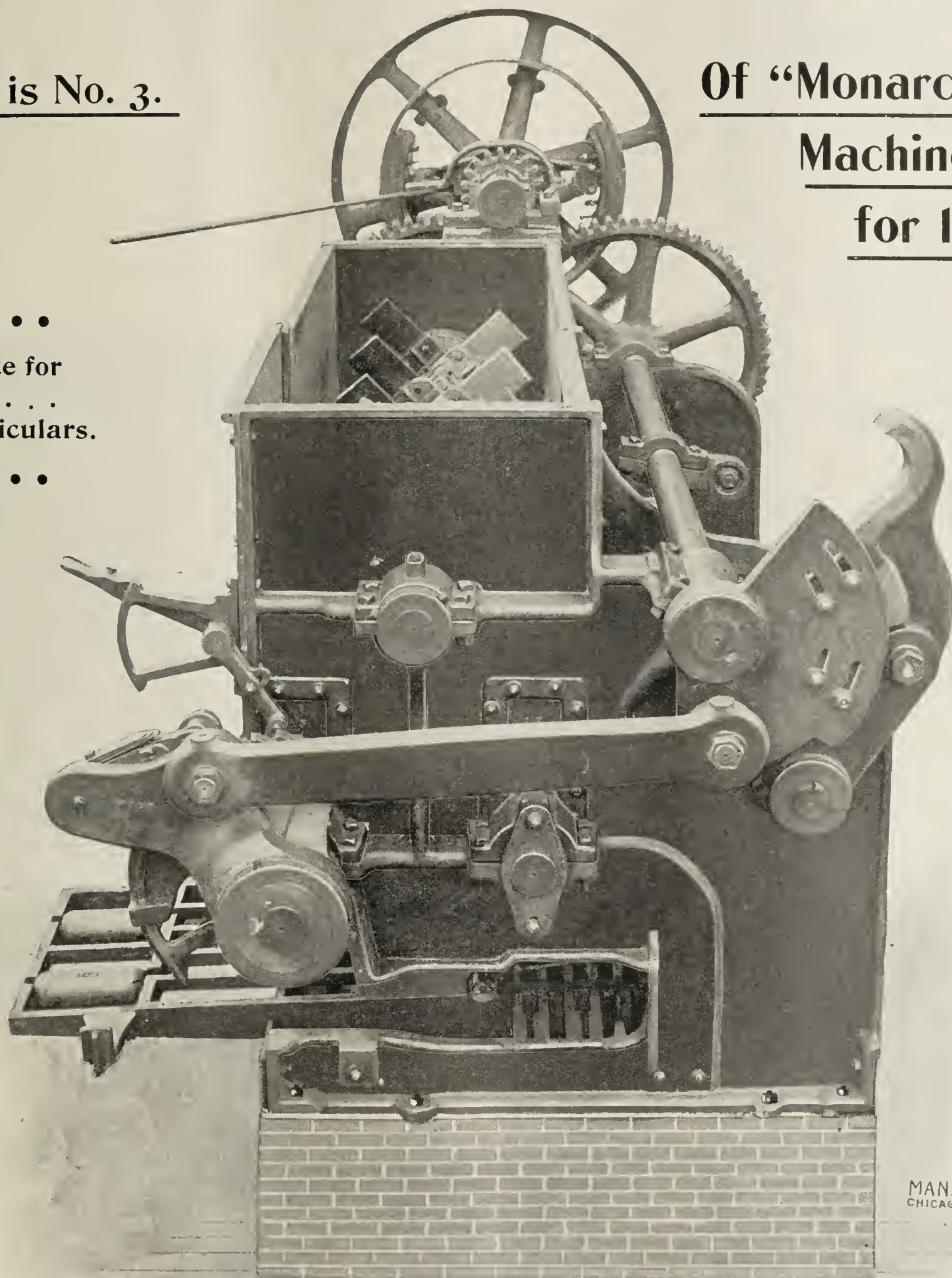
FOUR STYLES,

This is No. 3.

Of "Monarch"
Machines
for 1898.

• • •
Write for
Full . . .
Particulars.

• • •



MANZ
CHICAGO.

The Wellington Machine Company,

See Also Page 353.)

WELLINGTON, OHIO.

WITH THE PHILADELPHIA BRICKMAKERS.

SINCE MY LAST letter there has been quite a lull in the building trade, which, of course, always occurs around here for a couple of months after Christmas; nevertheless, there has been some little going on right along, for the weather has been exceptionally favorable, and if the building boom continues all through the season as it has commenced, it will far exceed the past season, which was a record-breaker. There are already permits granted for over five hundred two and three-story dwellings in West Philadelphia, in the Thirty-fourth and adjoining wards, all operations of considerable magnitude, ranging from twenty-five to one hundred and thirty houses, not including several small jobs of from one to five dwellings. I notice also a similar boom is striking other outlying districts, and right in the heart of the city bricks are being swallowed by the millions in improvements—altering and enlarging old structures, and in some instances demolishing the old ones and erecting new and modern ones. The seventeen-story building of the Trust Company, on the southeast corner of Chestnut and Broad streets, is well under way with the foundations, and will soon be ready for the steel framing; it is also reported that it will outrival in size and architectural display the new building on the southwest corner, put up last summer, the steel framing of which, I wish to put on record, was put together in place for one cent and three-quarters per pound! The new Mint on Seventeenth and Spring Garden streets is also a voracious devourer of bricks; its rate is about forty thousand a day; it has already consumed about one million and a half, and will need three millions more all told.

It appears our Chief of the Bureau of Building has some objections to the erection of "sky-scrapers" in our city; he wants to restrict them as to height, etc. From a sanitary point of view I think he is quite right. We have in modern fiction and other works vivid pictures of the dark, damp streets of the Orient, so narrow that vehicles going in opposite directions cannot pass only at certain turn-outs. The passing of vehicles in our streets does not apply; they are wide enough for that, but it requires very little figuring to reach the result of a narrow street lined on each side with sky-scrapers. What would the lower half of Chestnut street be like with twelve to twenty-story buildings on each side? Our Chief desires a law—which to me appears not only reasonable, but absolutely necessary—which would restrict the height of the buildings to one and a half times the width of the street.

Passing on, however, to points of interest to the brickyard: I wonder if some of the "brickies" do not feel like kicking themselves because they have no dryer but the "Old Sol"? It must be very irritating to hear the whistle blow punctually every morning at 6 o'clock for fourteen or fifteen weeks in my neighbor's yard, while I am shut down waiting for all danger of frost to pass by. If ever the importance of an artificial dryer was in evidence in Philadelphia, it is just now.

The Sullivan brickyard, at Fifty-second and Market streets, will soon be a thing of the past. The machinery and boiler have been removed, and what is left of the plant is so hemmed in by dwelling-houses that it will not be much of a surprise to find the space now occupied by kilns and dry sheds covered with dwellings before next Christmas, nor will it be very astonishing to find Overbrook and Haddington join hands in the matter of buildings within two years. The demand for bricks will be enormous this season. The open fields all around me are being cut up into streets and lots, and the suburban farmer is moving into the more distant suburban districts; the same resistless force is also driving the brickyards further out. The old Chambers yard, at Fifty-eighth, Fifty-ninth and Haverford, so recently run by H. C. Carroll & Sons, is now covered by nice, substantial two-story dwellings, all built last season.

There is every indication that "Down Towner" may be called upon to dump a few more millions into the West Philadelphia district, for I cannot see how the local yard can meet half the demand. It seems highly probable that the price of bricks will go sky-high before June, for I notice many extensive operations are projected, and some already under way in all the brick districts. True, the bulk of this boom is speculative, and it will behoove every brickmaker to shy clear of "straw men," for in these uncommon rushes somebody always gets "nipped." These new suburban homes are not only supplying the increasing population of our city, but drawing away the central inhabitants at a great rate. This, of course, is lowering property values in the city, just the same as the sky-scraping office buildings are drawing away the occupants of the old office districts. Take, for instance, Fourth street; many of its old substantial offices are empty, and offered at greatly reduced rents.

The report of the Pittsburg Convention is, I think, the best

that has ever appeared. Oh, my! but there is some good solid reading for "brickies," and "potties" too, for that matter. Who would have thought so much science would be required to run a brickyard fifty years ago, when the chief qualification was to be headstrong and stupid?

Now for a very busy season, one of the old-time rushes, when bricks will again be at a premium, and no dissatisfaction expressed or thought of by one invading the market of the other. Now let my down-town brother get his "hoop-la" ready, for eight dollars a thousand is close at hand, or my judgment is at fault.

A. STRETCHER.

BURNED CLAY—PROTECTION FROM FIRE.

It would seem that the fire fiend was determined to throw a challenge to the N. B. M. A. Since our meeting at Pittsburg, where we discussed the question of brick construction versus wooden buildings, and resolved to undertake a crusade against the supposed economy of using wood, there have been more than the ordinary number of destructive fires. Chicago has had her full share of these. The daily press has had a sad record of disastrous fires, many of them intensified by the loss of life, as well as by almost fatal exposure to fiery death. The loss of property has been immense, and should surely induce a careful study into the causes which produce this calamity.

Here is a point where the path of duty is most clearly marked out for the brickmakers of our Association. The N. B. M. A., by its committee already appointed, should examine the building laws of our cities, and see to it that they contain such statutes as shall enforce the use of burned clay for all purposes where it is known to be the safest material. Every brickmaker should inform himself upon this subject, and in the pursuit of his own business watch how the buildings are being put up, and observe whether these life-saving laws are being obeyed. And besides this looking out, he should in every way within his power become a teacher to instruct his own neighborhood in the real and substantial advantages of burned clay. No building ought to be constructed in any manner that is a menace to human life, either from ignorance or parsimony. It is a well-defined fact that a very large proportion of these dangerous fires are kindled in the halls and stairways of tenement houses, also that the risk of life in burning factories is greatly increased by the exposed condition of the stairways.

Here, then, is a starting point, and one that demands immediate attention. The building laws should insist upon all stairways being enclosed within brick walls, so that in the event of fire the inmates could escape from burning rooms, and by closing the doors obtain a temporary shelter and a means of rescue. If, on the other hand, the fire should start in the hall or stairway, it could not so readily communicate with the rooms, and the doors being closed, the fire could be withstood long enough to admit of relief by outside help or fire-escapes.

This is a self-evident necessity, and every brickmaker should to the full extent of his opportunities do all he can to help its practice. With burned clay walls used in the interior of our schools, dwellings and warehouses, the loss of life and property would be immeasurably reduced and the sale of brick be increased. Once let the brickmakers learn the use of their product and teach the public by precept and example, and we shall hear no more of that myth, "overproduction."

JAMES TAYLOR.

IT'S KEEPING EVERLASTING AT IT.

Men who have thought seriously about the matter know that advertising, be it great or small, pays a premium on the money invested, says the Press and Printer. It may not bring direct results, but it is more often like "casting bread upon the waters." The object of advertising is not so much to sell an article that everybody wants as it is to make everybody want an article that the advertiser sells. The merchant must keep his name and wares before the people all the time to catch new customers, who are ever changing.

People as a rule are very forgetful. They have to think pretty hard to remember the Vice-Presidential candidate two campaigns back, and yet he was pretty well advertised at the time. It has been truly said that the time to advertise is all the time. In business there is no such thing as standing still. A business man must go forward or he will fall back. Each year's effort should be to exceed last year's sales. The only sure way to do this is to advertise. Advertise in busy times, because the iron must be struck while hot, and advertise in dull times to heat the iron.



IF OUR AUTOMATIC TABLE IS
BETTER THAN OTHERS

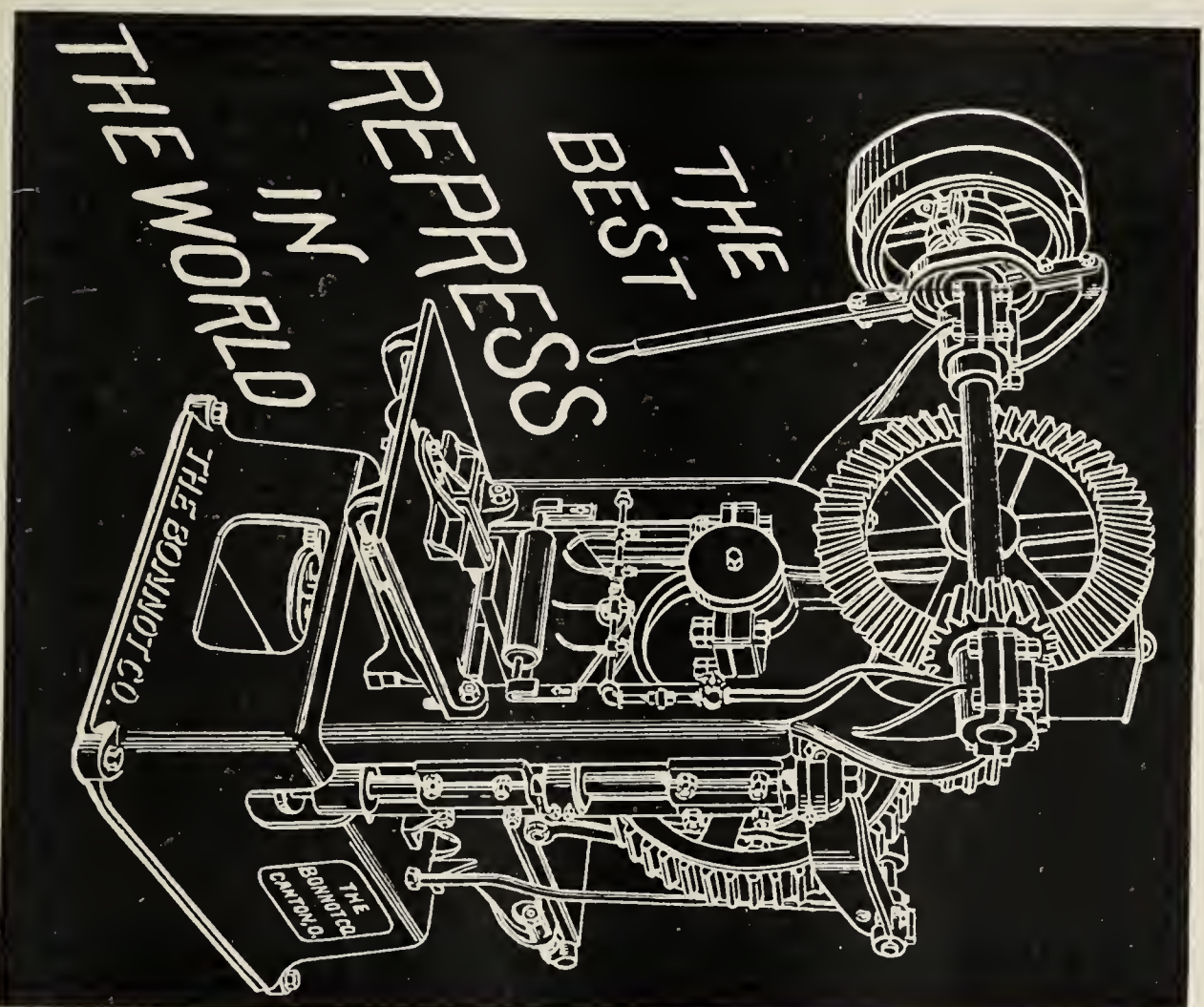
Why Better?

We can tell you why.

Write for printed matter.
Everybody who investigates decides in favor of the —

Canton Table.

—
The Bonnot
Company,
CANTON, OHIO.



Mack
Manufacturing
Company.

—
NEW CUMBERLAND, W. VA.,
April 12th, 1898.
THE BONNOT CO.,
Canton, Ohio.

Gentlemen:—We are glad to report to you that the Cutting Table has never given us any trouble since we started it up and it is doing excellent work. Both this and your Double Repress give better satisfaction than any machinery we have ever tried.

Yours truly,
SIGNED. MACK MFG. CO.,
S. G. Guillard, Sup't.

WHAT'S A FAIR ROYALTY?

A party owning a brickyard equipped with latest improved machinery, represses, dryers, kilns, etc., etc., is anxious to know what would be a just and equitable royalty (per thousand) on the number of brick made on such a yard, the conditions being as follows: Clay fairly convenient to machines and costing from bank to machine, in round numbers, 25 cents for 1,000. Average price of labor, 80 cents per day. Coal, from \$2.10 to \$2.50 per ton. Wood, from \$2 to \$2.50 per cord. Yard has a continuous kiln, 30,000 daily capacity, burning 95 per cent. hard, with 200 pounds slack coal to the 1,000 brick. Capacity of plant, 50,000 brick per day for nine months in the year. Market for all made. The brick will average during the year \$4.25 per 1,000 at the kiln. Will some of your many readers give their opinions as to what royalty would be proper, the renter having no outlay except expense of operating?

ENQUIRER.

NOTES FROM TIDE-WATER; VIRGINIA — DEATH OF R. M. BOOKER.

Mr. R. M. Booker died at his home in Hampton of pneumonia. He was one of the oldest and best known brickmakers in this section. He was sixty-two years old and had been in the brick business for many years, running two yards. He was one of the most prominent and highly respected citizens of Elizabeth county. He was connected with several other enterprises in Hampton and Newport News, as well as the brick business. He was also a member of the N. B. M. A. He leaves a wife and several children. Mr. Booker was an honest, upright, square-dealing business man, and made warm friends of everyone he had dealings with. The brickmakers of this section all offer their sympathy to the bereaved family.

The brickyards are all preparing for a busy season. Last year's stock is all, or nearly so, run off, and it looks like we are to have a very prosperous year, unless war should come, which may change our prosperity.

Norfolk and vicinity is going to be the metropolis of the South, with the finest harbor in the United States, as well as the climate, which cannot be excelled anywhere, and the finest trucking lands in the world; the United States Navy Yard, with its immense pay roll every month, and the hundreds of factories scattered everywhere. Then her sister city, Newport News, only twelve miles away, with its great ship yard, where thirty thousand people saw the two great battleships Kentucky and Kearsarge launched on the 25th. The great ship yard employs between three and four thousand men. The harbors of Norfolk and Newport News are lined with great plants of different kinds, great railroad piers, where thousands of tons of coal are shipped every year, with a dozen or more railroads terminating here; and with their immense docks and warehouses one can readily see what an immense export trade is done here. It is strange to say we have no press and ornamental brick plants here. We have some very good common building-brick yards, but no yards making fancy wares, and there is a fine market.

Messrs. E. W. Face & Son, of Norfolk, have just completed one of the finest yards in this section, with the latest improved machinery, kiln and dryers. They are located on the water front, and have built several large barges to carry clay from the James river clay beds to their plant. Others have their plants on the James and Nansemond rivers, and freight their brick.

H. L. JACOBS.

Suffolk, Va.

CANADIAN TARIFF ON CLAY PRODUCTS.

The portions of the new Canadian tariff law that bear particularly upon the brick and pottery trades and kindred interests, read as follows:

Building brick, paving brick, stove linings and fire brick, n. e. s., and manufactures of clay or cement, n. o. p., twenty per cent. ad valorem.....20 p. c.
Earthenware and stone ware, viz.: demijohns, churns or crocks, thirty per cent. ad valorem.....30 p. c.
Drain tiles, not glazed, twenty per cent. ad valorem....20 p. c.
Drain pipes, sewer pipes, chimney linings, or vents, chimney tops and inverted blocks, glazed or unglazed and earthenware tiles, thirty-five per cent. ad valorem35 p. c.
Baths, tubs, and washstands of earthenware, stone, cement and clay, or of other material, n. o. p., thirty

per cent. ad valorem.....30 p. c.
All goods not enumerated in this act as subject to any other rate of duty, nor declared free of duty by this act, and not being goods the importation whereof is by this act or any other act prohibited, shall be subject to a duty of twenty per cent. ad valorem.....20 p. c.

—Free List.—

Clay, including china clay, fire clay and pipe clay; gannister and sand.

Crucibles, clay or plumbago.

Fire brick for use in process of manufacture, or for manufacturing purposes.

All articles for the use of the Governor-General.

Fuller's earth, in bulk only, not prepared for toilet or other purposes.

BRICK SETTING AND BURNING IN DOWN-DRAFT OR UP-DRAFT KILNS.

NOT LONG AGO I was called from home to answer a communication. I traveled through the beautiful valley of the Susquehauna, with its beautiful scenery, its mountains towering high above the river bed, and as you pass along through some of the pretty little hamlets, then out again in the open valley, then strike the heavy grade, rising up the side of the mountain towering way above the settlement below, one is charmed with its beauty. And the numerous dams and chute-ways for rafting logs to the sawmills all along the river make up a picture fit for any artist's brush. "Say, old man, bold on; what has this got to do with setting and burning brick?" says some "mud lark." I must frankly answer: nothing to do with brickmaking; but we brickmakers like to look beyond the confines of our own dooryard occasionally. For one, I like to see Gates at the top or bottom of an article in the Clay-Worker, for I have learned to expect something worthy of thought in connection with that name. His "Buttonhole Talks" are rangy, and I like them all the better for that; but to

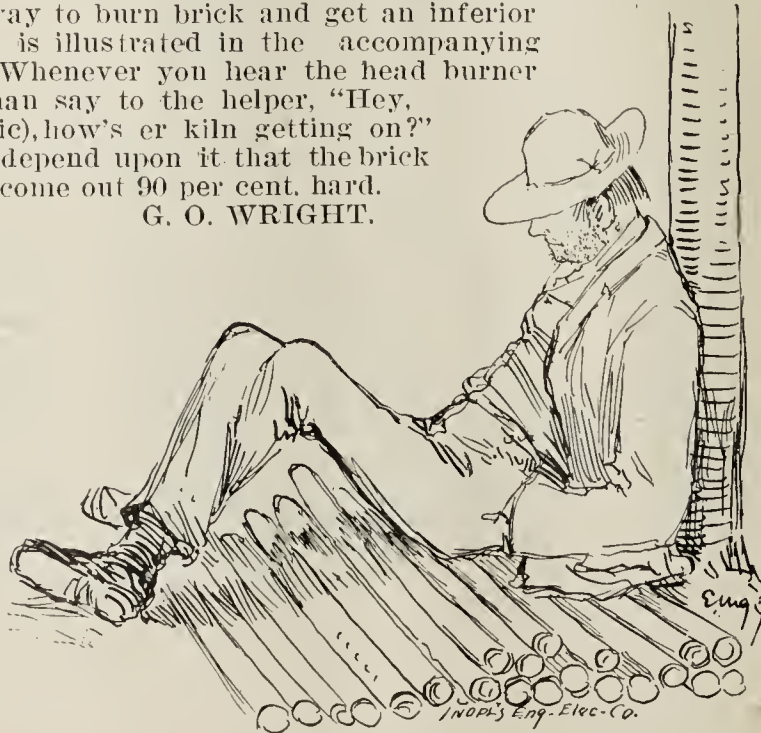
—Setting Brick in the Down-Draft Kiln.—

There ought to be one course of good hard paving brick set in the bottom of the kiln, and then set the green brick. This will do away with the pale brick that are found in the bottom of the kiln after a burn. They ought to be set five-sixteenths of an inch apart, level and even all through the kiln. They will better stand the crushing weight and keep the shape better under a heavy heat within a fraction of the fusing point this distance apart, and will insure a perfect draft and combustion. It will also prevent the heat from traveling through the kiln too rapidly, thoroughly burning the brick as the heat travels through them.

Care should be taken in drying off not to redden the brick and thus burn the chemical moisture out of them before raising the heat. If you do, it makes them harder to burn and is a waste of fuel and time. When the brick are sufficiently dried and the kiln has sufficient draft to form perfect combustion, it is ready to receive the heat. Raise it as rapidly as the draft will permit until within a fraction of the fusing point. The burner should be continually on the watch for this important point in the burning, and to know when it takes place. This will prevent the brick from being burned too much on top. He will then regulate the draft on the kiln so as not to increase the heat, following it up until finished at the bottom.

One way to burn brick and get an inferior quality is illustrated in the accompanying sketch. Whenever you hear the head burner or foreman say to the helper, "Hey, Jack (hic), how's er kiln getting on?" you can depend upon it that the brick will not come out 90 per cent. hard.

G. O. WRIGHT.



BRICK MACHINERY

Wonder No. 4.

Capacity, 60,000 to 100,000 per day.

Big Wonder.

Capacity, 50,000 to 60,000 per day.

Intermediate Wonder.

Capacity, 25,000 to 40,000 per day.

Little Wonder.

Capacity, 20,000 to 25,000 per day.

BRICK CUTTERS

Cunningham's Side Cut Automatic Cutter.

Cunningham's End Cut 3-Stream Automatic Cutter.

Cunningham's End Cut 2-Stream Automatic Cutter.

Cunningham's End Cut 1-Stream Automatic Cutter.

Side Cut Broad Delivery Table.

Hand Brick Cutting Table.

Combination Side and End Cut Hand Brick Cutter.

PUG MILLS

No. 3, Plain Closed Top Pug Mill.

No. 3, Open Top Pug Mill with Wallace Patent Cleaner Teeth.

Tempers clay for 75,000 to 100,000 brick per day.

No. 2, Open Top Pug Mill.

No. 2, Closed Top Pug Mill.

Tempers clay for 35,000 to 50,000 brick per day.

No. 1, Open Top Pug Mill.

No. 1, Closed Top Pug Mill.

Tempers clay for 25,000 to 35,000 brick per day.

No. 1, Wallace Patent Pug Mill.

No. 2, Wallace Patent Pug Mill.

Tempers clay for 20,000 to 40,000 brick per day.

DRAIN TILE MACHINERY

Little Wonder Makes 3 to 12 inch.

Capacity, 8,000 to 12,000 4-inch daily; others in proportion.

Intermediate Wonder Makes from 3 to 18 inch.

Capacity, 10,000 to 15,000 4-inch daily; others in proportion.

Drain Tile Cutting Tables for large and small tile
Trucks for Handling Large Tile.
Reversing Device for large tile.

CLAY PREPARING MACHINERY

Dry and Wet Pans, 6, 8 and 9 feet, with wood and iron frames.

Clay Screens.

Clay Crushers and Stone Separators of many designs and capacities to suit conditions.

Clay Elevators all lengths and widths to suit your desire.

Dry Clay Bucket Elevators of length and breadth to suit desires.

Friction Hoisting Drums.

Friction Geared Hoisting Drums.

Clay Cars. Truck Wheels and Axles.

Kiln Doors and Frames.

Kiln Doors without Frames.

Wheelbarrows for Brick and Tile.

Brick Pallet Spring Trucks.

Engines. Boilers. Pumps.

Shafting, Pulleys, Hangers,
Couplings, Journal Bearings and
Belting, both Rubber and Leather.

A Long Argument



IS NOT NECESSARY TO CON-
VINCE PRACTICAL BRICK-
MAKERS OF THE MERITS OF
OUR MACHINEERY. OUR suc-
CESSES PROVE THAT. . . .

A Case in Point

Is that of the Burnham plant in Milwaukee where we were reported to have made a failure. Under date of October 26th, '97, Mr. John F. Burnham writes:

“You guaranteed the **Big Wonder** to make 50 M brick per day; as a rule we have been able to better that amount by several thousand, and running under favorable circumstances have made as many as 80,000 a day, and you know our clay is very difficult to work. In fact some have said it could not be worked successfully by the stiff clay process—but the **Wonder Machine** is doing it.”

Mr. Burnham's equipment including Granulator, Compound 4-Roll Crusher, Pug Mill, Big Wonder Machine and Cunningham's Automatic Cutter was all furnished by us, and is entirely satisfactory.

Need we say more?

If you want anything in the line of clayworking machinery. Don't fail to get our prices.

Wallace Mfg. Co.

Frankfort, Indiana.

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

See Ad. on Page 391.

MERCHANT HUBBARD.

Old Merchant Hubbard
Went to his cupboard
To brood o'er his business so blue.
He'd ne'er advertise,
So daily his sighs
Went up in a manner not new.
Young Merchant Hubbard
Went to his cupboard
To count up the gains of the day;
When he came there
He found profits to spare,
For he advertised well—the best way.
—Exchange.

THE NEW YORK MARKET.

IN A DAY OR TWO March, 1898, will be numbered with the past. In many ways it has been a remarkable month. Generally good weather, so fine that in times past there are yards here which would have been molding when the weather was not nearly as good. This year one can truthfully say that the brickmakers are making haste slowly.

The sound of the exhaust of the steam pump is heard all day and part of the night, and in one case all night—not because they want to get clay to begin with, for if the bank was clear of water they would not mold, as the demand for brick will not call for all the stock that has been carried over during the winter, though it is less by millions here than for some years. There is a feeling among brick men, though not openly expressed, that there is “something” that is hanging over the trade that they cannot explain—a feeling that, though the coming season looked bright a month or so ago, it has lost its rosy color of being a good one. Is it because the shadow of war hangs heavily over the country? If so, do not express it. As sure as daylight, if war results, the tide-water yards will feel the effects very much. There certainly is a feeling, and felt by all who make brick for “profit”—and by the Convention report in the Clay-Worker it seems that profit and production go hand and hand in the brickmaking industry all over the Union.

The behind-the-age brickmaker, with his open yard and other obsolete traps, does not seem to be the only one who is not paying dividends; in fact, he is holding on, even if it is the short end of the rope. Well, if you could see the other fellow's books and sift the high price put on a deteriorated plant out of his statement, as well as other matters which tend to make a good “showing” to the stockholders, it would be found that the little fellow was not in as deep water as his more pretentious neighbor with his more up-to-date plant. Certainly there is not the confidence among the manufacturers that there was during the winter. If the price of brick at present and a year ago is taken into consideration, the brickmaker should hasten to make as well as ship, as the rate now prevailing is high. Pale brick are selling for as much money as some Jersey brick brought a year ago—\$3.50 and \$3.75; hard smooth brick are holding their own remarkably well—1897, \$4.12½ and \$4.75, at present \$5.75 and \$6.25 the ruling rate. The rates of to-day are remunerative, and a profit is in sight, but for how long no one can tell. Probably the under-current of feeling is that it is best to make haste slowly in the beginning. As one reads between the lines of the Convention report it looks as if the X-rays were developing the fact that I have been advocating for years—that the brick trade consists of a class of business men who are not found in any other line.

—Why Some Cut Prices.—

The low rates or the cutting of prices and why they do it—no doubt if one could examine the books of most of the men who “cut,” it would be found that the want of money is the cause. A few days ago I received a letter from a brickmaker asking me if I could recommend a way that he could make brick for less money, as he had to compete against a rate, delivered, under \$4 per thousand. Where can brick be made and delivered at the job for any such figures and show a profit?

The continued drop of water will wear away the stone. So with those who cut—they will soon wear out what capital and credit they have. The only safe way in the trade to-day is to make what brick you can carry and hold them for a remunerative price. If they do not sell this year, age will not injure them; they will bring paying rates later on. Age helps wine, and certainly age has developed a decided improvement in the twelfth annual Convention held in Pittsburg. Compact, solid matter was placed before the members of that body which is well worth study. Some bubbles were pricked, and hobbies

which some have always held up as the only way to burn brick because “I” advocated it were shown to be a very expensive way for a little gain. May the next meeting be a still further improvement on the one of '98, and without doubt the attendance will increase. To learn something is what all go for, and this season has been a long stride in that line.

—Culls—

Are found under the sheds as well as piled outside on each brickyard in the country. The more culls the less profit in the long run. If a buyer comes under the shed and says, “If you will take out such and such brick I will take them,” the manufacturer agrees for such a figure, say a quarter or half a dollar per thousand, to do it, and thinks he is doing well. As everything is done with a rush on brickyards, when the man sends for his brick, either by boat or wagon, one or more men are taken from other work to load the brick. The culls are met with, and if it is a wagon that is being loaded, one man in the kiln tosses out the good and the driver stows them. As the culls are reached another man must be called to pile them down on the kiln ground. There may be but a few handfuls, but the man must stand and wait till more are reached, nothing to do. The loss of time may be from fifteen to thirty minutes, according to number which have to be taken out. As they are piled on the ground—the handiest makeshift at the time being—in a few days they are in the way and have to be moved; a man is set at the job and they are put under the eaves or in some spot out of the way for the time. Anyone who has been on a brickyard knows how rapid a man will work on a job of that kind. While moving them he may upset his barrow, and a lot of broken brick is the result, and are thrown away. He is careless in piling them, and the pile falls down. After a while wood or some other substance is to be put where the pile of culls are, and they must be shifted. Well, where? The foreman looks around and concludes that the best place for them is outside, and out they go, exposed to the weather—and who wants such stock? And if you want to see time killed, just watch the man or men who are set to wheel them out. The proverbial molasses in winter can't discount their time. When the time taken for hauling these brick from first to last, with what they will sell for if ever a customer is found, is taken into consideration with the price paid in the first place, it will be found a losing game. Still it is done. A straight price as your brick run is the only way to hold your own.

An order to ship a cargo without arches is received. Nine or ten people make a gang. As the arch brick are reached they are piled out, and many are broken, and they will have to be shifted, and out of the twenty-five hundred brick in the arch about half will be fit to mix with pale brick for walling. The rest have become so broken that they are good for nothing—all for say 25 cents per thousand, at the outside 37½ cents, advance. Take loss on brick—time of handling—where is the profit?

—Market—

Is taking stock freely, although it is nearing the season when there is a lull between the closing of old contracts and the signing of new. The old saying that you are sure of nothing except you have it in your throat and cannot get it up or down seems to hold in the case of the brick market. A month or more ago all was happy in the prospect of receiving something like cost the coming summer for their stock. At present it may be one of the long list of bad years which have passed by. Straws show one way that may seriously affect it this year, and that is, the capitalists are holding back loans on new work. The expressions of men in touch with this part of the trade is, the war scare has affected loaning considerably; another says that the war scare loaners are unwilling to do anything until they see what the outcome will be; another, it is more difficult to effect a loan. Such being the case, work that was coming out will be held back. The price is from \$5.75 to \$6.25; pale, \$3.75. If the rates will remain till old stock is worked off, it will be a great help to many.
A. N. OLDTIMER.

GRATIFYING TRADE IMPROVEMENT.

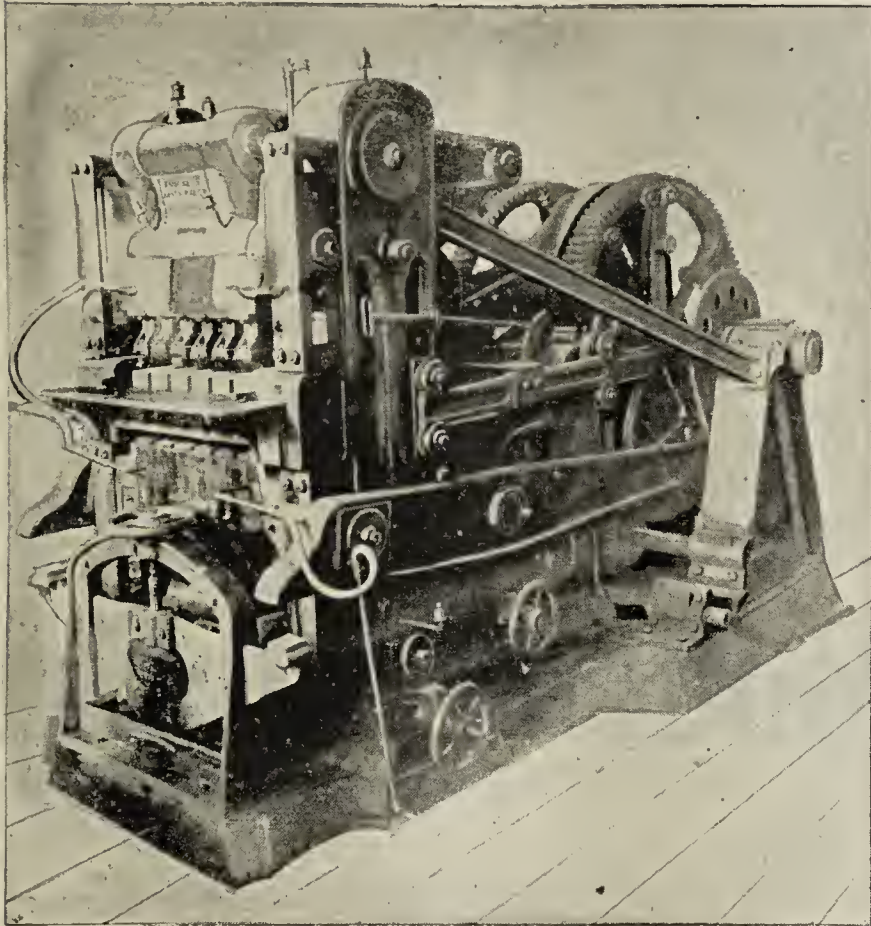
Editor Clay-Worker:

Enclosed please find postoffice money order for \$2 in payment of subscription to the Clay-Worker for 1898. As for business, we can say that the past year has been quite prosperous, but material has sold at low figures. We look forward, however, for a better season in '98. We have found the Clay-worker very useful as well as instructive, and can without hesitation say that it is without a doubt the leading journal of its kind in this country. Extending to you a happy and prosperous New Year, we remain

Respectfully,

ROESKE BROS.

The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

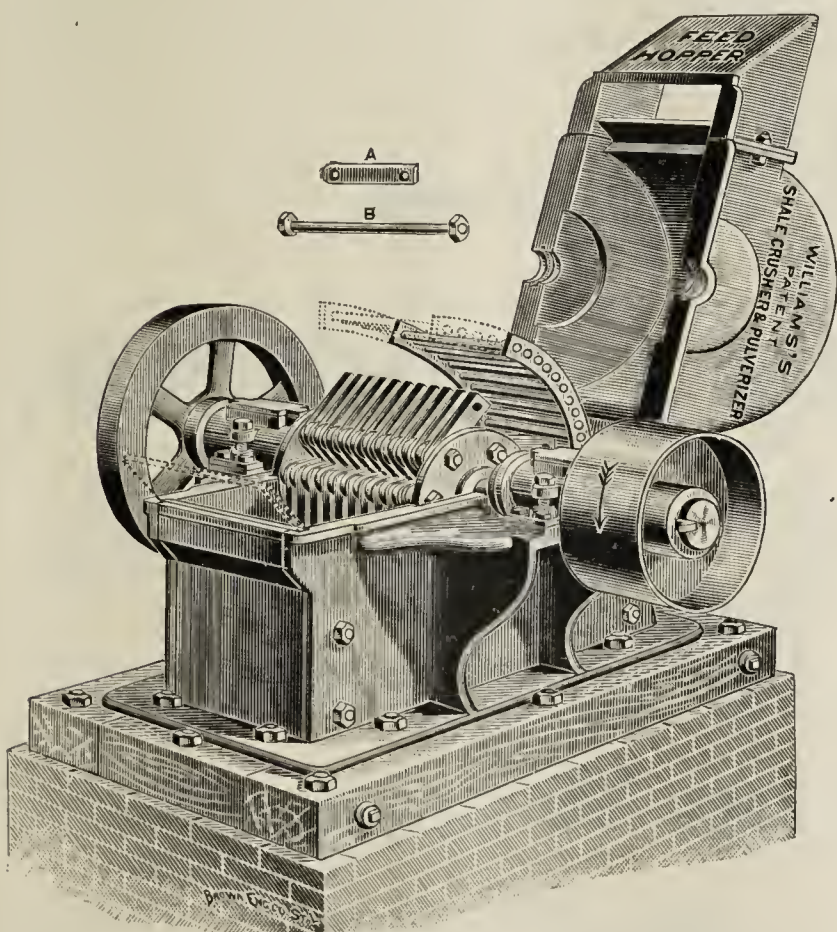
Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION.

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

A Clay Pulverizer of Wonderful Capacity.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

Our Pulverizer is Fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.

Office of HYDRAULIC PRESS BRICK CO.

St. Louis, Mo., October 30th, 1897.

MILTON F. WILLIAMS, Esq., City.

Dear Sir;—Enclosed please find our order No. 125 for one No. 2 Pulverizer. In a few days, or as soon as our drawings are completed, I expect to give you an order for two more. We have three of your Pulverizers now running, giving perfect satisfaction. We are able to grind clay to any degree of fineness by making very slight changes in the machine. They have been running several months without repairs worth considering.

Yours truly,
HYDRAULIC PRESS BRICK CO.,
W. N. Graves, Gen'l Supt.

HOTEL BERNARD, Wagner, Ind. Ter.

WILLIAM'S PATENT CRUSHER AND PULVERIZER CO.,

Dear Sirs:—The Pulverizer we bought of you sometime ago is a dandy, we would not exchange it for any grinder we know of. Keeping it in repair costs nothing to speak of. Wishing you every success, we are

Yours respectfully,
TAYLOR & RAINS.

These machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known. Will guarantee them under any and all circumstances.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.

2705 North Broadway, St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED—Good pressed brick setter and sorter. 32 d Address BOX 23, Lehigh, Iowa.

FOR RENT—Desirable brickyard on James River, Va., equipped for business. 42 d T. F. ROGERS, Norfolk, Va.

WANTED—Forty double-deck dry cars; width of gauge 24-inch. Must be in good condition. (2 tf d) E. & H., care Clay-Worker.

WANTED—Good second-hand Potts Disintegrator No. 2 or 3. Must be in good condition. 41 d "1896," care Clay-Worker.

SITUATION WANTED—As superintendent or burner of terra cotta, face, fire or paving brick plant. Best of references. Apply 41 cm J. F., care Clay-Worker.

WANTED—About 50 to 60 second-hand soft mud brick and tile cars and one dry and wet pan and cutting tables for brick and tile. 41 dm] E. BAUMGARTNER, Cissna Park, Ill.

FOR SALE—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 1 tf d JESSE T. MORGAN, Wilkes-Barre, Pa.

FOR SALE AT A BARGAIN—One 4-mold Boyd dry press brick machine in perfect condition. THE FERNHOLTZ BRICK PRESS CO., 8 tf l St. Louis, Mo.

NO DRY PRESS BRICK PLANT complete without the Carinichael Clay Steamer. T. W. CARMICHAEL, Inventor and Manufacturer, 6 tf d Clarksburg, W. Va.

BRICK PLANT FOR SALE—Well equipped with latest improved machinery, which is new. For particulars inquire of the DANVILLE FIRE BRICK CO., 23 c Danville, Pa.

FOR SALE—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN, Room 13 Palmer House, Chicago, Ill. 3 t f d

WANTED—Situation as foreman or burner, down-draft kilns, fire brick, shale pavers, soft mud, shingle tile and especially dry press. 29 years experience. References. 41 c "WORK," care Clay-Worker.

WANTED—Situation as superintendent or foreman of brick works; practical in every detail. Mud or dry process, red or buff clays, practical with all machines, kiln building, etc. Best of reference. BUFF CLAY, care Clay-Worker.

FOR SALE CHEAP—Potts Steam Winding Drum, 24 inches diameter, 30 inches long, used only one month. Also 400 feet three-quarter inch cable. NATIONAL BRICK & TERRA COTTA CO., 41 d Passaic, N. J.

FOR SALE—Brickyard at St. Johnsville, N. Y., complete with down-draft kiln, Freese & Co. Pug mill Auger Machine, boiler and engine, barrows, sheds all complete for business and abundance of blue clay; on easy terms. Must be seen to be appreciated. Inquire of ROTH & ENGELHARDT, 23 cm St. Johnsville, N. Y.

FOR SALE—Brick and tile plant in the South; R. R. switch to kilns, soft and stiff mud machines, Sharer dryer. Clay good for front brick and fire proof wares. Growing market from wide and prosperous territory. Will sell entire plant, or machinery alone. Will sell part interest with management to right man. Address G. P. ORENDORFF, 2 tf c Lacon, Morgan Co., Ala.

FOR SALE—A SNAP—Henry Martin steam brick plant complete. Capacity 30,000; in good order, with or without 11 acres clay land, on railroad siding. No other steam plant here. Good demand. Only \$1500 for whole outfit. 41 cm LOCK BOX 13 Winchester, Va.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address SUPERINTENDENT, 41 d care Clay-Worker.

PRESS BRICK PLANT FOR SALE OR LEASE.

Complete. Daily capacity 15,000. Good condition. Good opportunity for active parties. Terms easy. Located in the Central part of Pennsylvania. Address "JOHN," 43 c care Clay-Worker.

FOR SALE.

Brick and tile plant consisting of 21¼ acres of land best clay in the State, 10 feet deep. Michigan Brick and Tile Co's Auger Brick Machine and Pug mill, Potts disintegrator and conveyor, kilns to hold 600,000 brick, 60 horse boiler and engine, hot floor dryer, all necessary tools, 4 houses and stable. Capacity 30 M per day, 20 miles from Norfolk and five other growing cities. Good demand for all the brick at \$5 per M on vessel at yard; can load for 12½ cents per M. This is the finest section of the South. Good reasons for selling. Price \$5,000. Yard running now. Address 41 d H. L. JACOBS, Suffolk, Va.

FOR SALE CHEAP.

The entire outfit of Milo Horlocher, deceased, of Parks Mills, Franklin County, Ohio. Consisting of 50 h. p. boiler, good as new; 20 h. p. engine, steam pump and heater with all connections and fixtures. Tiffany's New Centennial, used but little; tile dies from 3-inch to 15-inch. Tiffany's Patent Revolving tile table. Hollow block die, brick die and tables; two roll clay crusher with clay elevator. Tile elevator 5x6 feet 25 feet high, tile trucks and other belongings. Will sell as a whole or in parts. No delay in this sale, write or come quick. A big bargain. Address J. W. EVERAL, Agent, 41 d Westerville, Ohio.

IF YOU
NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also *Decks for Dry Cars.*

We can ship them anywhere.

Get good Pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices.

W. B. MERSHON & CO.,

Saginaw, East Side Mich.

Dry Pan Clay Crushers.

CLAY SCREENS AND ELEVATORS.

Eagle Iron Works,

Des Moines, Iowa.

A RARE OPPORTUNITY, For Profitable Investment.

A fine opening for a Brick and Tile Factory. An abundance of Excellent clay and shale a good market that must increase from year to year.

REPORT ON CLAY.

From—Dr. Chas. Leali, Kingsland, Ark.
Received—February 12, 1898, one box, about 15 pounds.
Kind of clay—Shale Rock.
Machinery necessary to reduce—Dry pan.
Best system for working—Either Dry Press or Stiff Clay.

This is a fine quality of shale rock of a fire clay nature. It pulverizes easily and works well in the machinery, but takes a very high pressure. A dry-pan should be used to reduce it. The samples submitted were made by the dry press process.

We made two tests of this material, one for high-grade building brick, the other for fire brick. The building brick blocks submitted are marked from 1 to 15, showing the different degrees of heat at which they were burned. No. 1 finished burning at about 1900 degrees and No. 15 at 2160 degrees of heat. The gradations of color will be readily seen. Very beautiful light colored building brick can be made from this material with the proper treatment, and by fire-flashing a fine old gold color can be obtained, as will be noticed on some of the samples.

The fire clay tile were made with a mixture of grog; that is, by adding some of the burned clay which had been coarsely ground. This is the usual practice in making fire brick to give porosity to the brick. These were burned at about 2500 degrees of heat, and they would readily stand 3000 degrees. The fire clay muffle in which they were burned was melted down, but the tile stood right up and show no signs of over-burning.

This is one of the most valuable materials I have ever tested from the Southwest. High-grade front brick, common building brick, first-class fire brick, and tiling can be made from it. This clay will stand forced drying, and an exceedingly high heat in the kilns without losing shape, checking or cracking.

If this material is situated so that it has easy access to market, and there is any quantity of it, it should prove a bonanza when properly handled. The clay will work well either by the stiff clay or the dry press process.

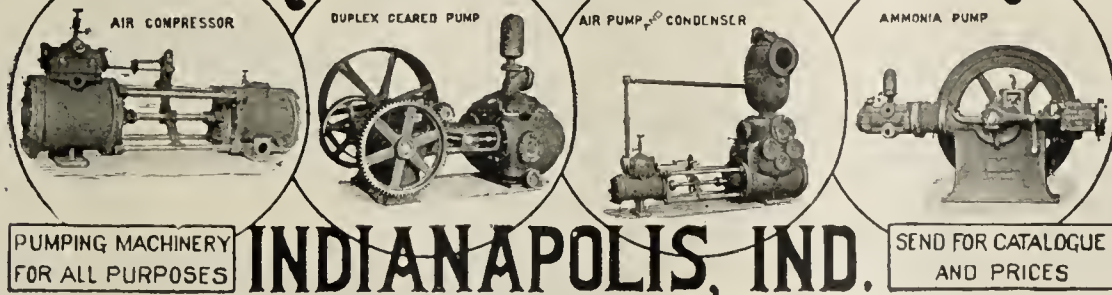
I shall take the liberty of placing a piece of this clay, both raw and burned, in the Field Columbian Museum.
(Signed) JOHN J. MORONEY, CLAY EXPERT,
Chicago, March 10, 1898. For Field Columbian Museum.

The clay referred to in above report by Mr. Moroney, is situated six miles north of the town of Kingsland, Cleveland County, Ark., on the Cotton Belt railroad, in section 20, township 9, south of range 12 west. The strata is from 5 to 8 feet thick and from 6 to 20 feet below surface. It underlies 80 acres of land, to which the title is direct from U. S. Government to patent.

My purpose is to form a stock company to manufacture this material for the market, believing that this country offers a splendid field for an enterprise of that kind. The trade South and West could be easily controlled by a plant at this place. Shreveport, La., is paving her streets with brick bought in Coffeerville, Kansas. By recent travel and inquiry have learned that there is practically no competition in the clay business in the field of trade that would be reached by the proposed plant. I refer to author of above report for information regarding the quality of clay. For all other information, apply to

CHARLES LEALI, Kingsland, Ark.

DEAN BROS. STEAM PUMP WORKS.



Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

WANTED — A position as superintendent of a brick plant. Soft mud, stiff mud or vitrified, by a man possessing executive ability, and a thorough knowledge of the business. Address M. J. 3 1 tp C. Care Clay-Worker.

TO RENT — Brick yard; two Martin machines, fully equipped and ready with small outlay to start manufacturing. No competition. Present owner would assist in the management. Address W. H. ODELL, 3 1 c Brookville, Canada.

FOR SALE AT A BARGAIN — One Penfield Upright Soft Mud Brick Mill with Clay Crusher, Elevator and Pug Mill, with all fixtures. Used but a part of one season. Good as new. Address J. W. W., 3 3 cm Care Clay-Worker.

WANTED — Situation as Superintendent or Foreman of brick works. Practical in every detail. No. 1 burner, up or down-draft kilns, dry or stiff clay process. Address SUCCESS, 3 tf 125 P. Care of Clay-Worker.

BRICK PRESSES FOR SALE. — One nearly new 3 mold Brewis Brick Press, used one season, \$1000.00; one Ditto, used three seasons \$800.00; one nearly new Steadman Pulverizer, \$250.00. All in good condition. Address 2 3 dm GERNERT BROS LUMBER CO., Cor 6th, Hill and A Sts, Louisville, Ky.

FOR SALE — We will sell a part interest or the whole of our Paving Brick and Tile factory. Will give a good liberal deal as we cannot give it the attention necessary. For full particulars address LEHIGH BRICK, TILE & MFG CO., 3 3 dc Lehigh, Iowa.

FOR SALE CHEAP. — One Second-hand, double die Columbian Repress; practically as good as new. One Quaker Horse-power Brick Machine, in good order. One Monarch Brick Machine, only used one short season. All in running order. THE HORTON MFG. CO., 1 tf L. Painesville, Ohio.

FOR SALE CHEAP — One Penfield Plunger brick machine, capacity 50,000 per day; price, \$150; one Disintegrator, consisting of two Rolls, Bar and Chain Beaters, Hollow Boiler Iron Hopper for steam heat, price, \$150; one pair of Penfield Steel Rolls 24 by 36 inches, price \$125. Address GEO. H. DOWNING, 3 2 cm Kearney, Neb.

FOR SALE — Very cheap and on easy terms, owing to death of proprietor, one of Virginia's best equipped and located brick yards. Has a capacity of 90,000 building brick, located on water front, and also has good rail facilities, abundance of good clay and cheap fuel. A money making plant for any good brickmaker. For full particulars address H. B. BOOKER, Administratrix, 2 3 d Hampton, Va.

H. W. CLASSEN & CO.,

CHAS. H. CLASSEN, Proprietor.

Manufacturers Agents, for sale of Sewer Pipe, Fire, Pressed and Paving Brick, Clay Products, etc. Correspondence invited. 305 McElderry's Wh'f (Long Dock.) Box 8, Builders' Exchange, 3 3 c Baltimore, Md.

ENGLISH PLANS FOR PLASTIC BRICK WORKS.

Complete sets including general plan and elevation of works.
Plans and sections of machine room.
Plans for Dryer heated with waste gas from boiler.
Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.
Prices on application to BENNETT & SAYER, Derby, England.

FOR SALE—One nearly new 4-mold Boyd Dry Press brick machine; one 4-mold Eureka dry press brick machine; one No. 2 Worrell clay dryer; one 48-inch Ross disintegrator; five second-hand horizontal boilers, 15 and 16 ft lengths, 3-inch tubes, ranging from 50 to 60 h. p., 5 and 6 foot diameter; one straight line engine, 14 x 14 cylinder, nearly new, a No. 1 order; 8 fans, 7 ft. diameter, good as new. Will be sold very low. Address C. SIEDLER, Pres. 2 tf dm 156 Fifth Ave., New York.

FOR SALE CHEAP.

One second-hand, double die Columbian Repress; practically as good as new.
One Quaker Horse-power Brick Machine, in good order.
One Ten Horse Power Portable Engine, in good order. THE HORTON MFG. CO., 1 tf l Painesville, O.

TO PRACTICAL BRICKMAKERS AND CAPITALISTS.

TO BE SOLD—The whole or half interest in the two best brickyards within hauling distance of the city of Vancouver, B. C. The brick are preferred to all others, there is demand for all you can make at the best prices, which averages seven to eight dollars on the yard. Apply to 3 tf 5p J. W. BURNET, 13th ave. Mt. Pleasant, Vancouver, B. C.

FOR SALE.

Two 8-foot dry grinding pans, under gear pan.
One 8-foot, under geared, iron frame wet for wood work.
One new 5-foot wet pan for wood frame.
One Potts stock brick machine.
One Potts sanding machine.
One 7-foot horizontal pug mill.
Two vertical pug mills.
Large lot of steel and iron pallets.
Twenty pallet cars.
One 30 H.-P. horizontal tubular boiler.
Lot of boilers, tanks, etc.
THOMAS CARLIN'S SONS.
11 12 c Allegheny, Pa.

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/2 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
1 Barr Pumping Company steam pump.
1 Chambers Bros. Company brick machine.
All new or little used, and in excellent condition.
WALNUT, 1 tf d Care Clay-Worker.

Study Law at Home.

An opportunity for ambitious young men to take up the study of law without neglecting the business of earning a living. You can live at home while preparing for admission to the bar. We require only your evenings and guarantee as thorough a legal training as may be had at any law school in America. Write at once for our special offer to new students.

Indianapolis College of Law,
80 When Building, INDIANAPOLIS, IND.

A. F. TENNILLE'S

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Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

The PERFECT CLAY SCREEN,

..Is the Acme of Perfection..

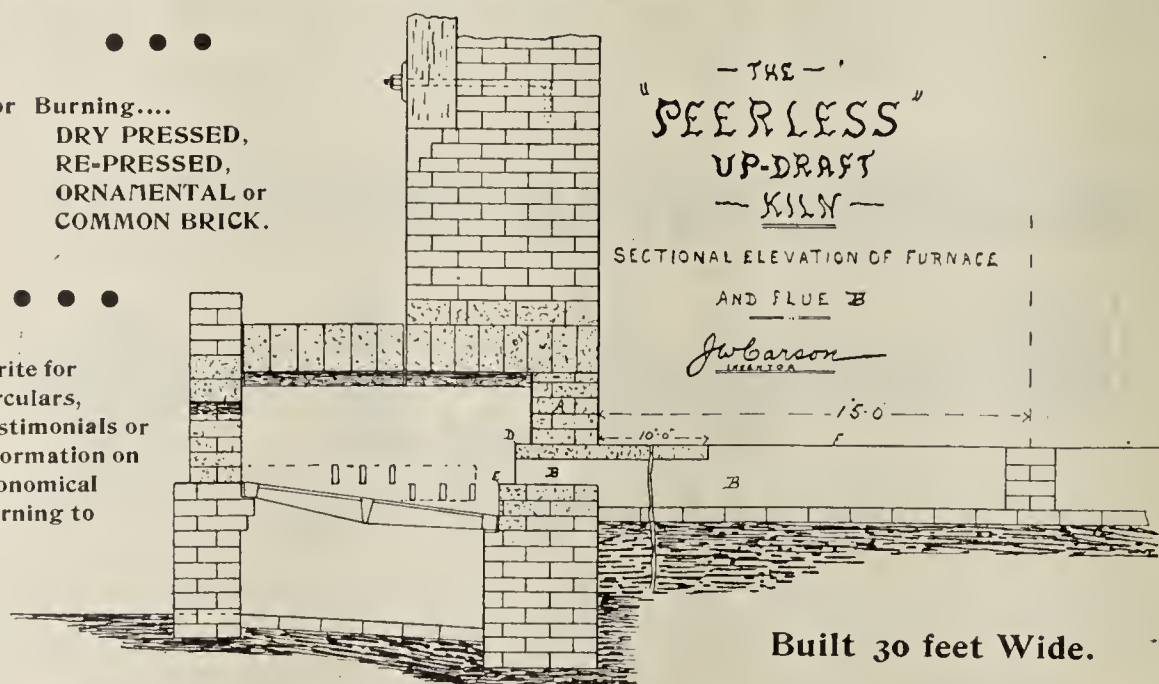
THIS SCREEN was not designed with the object of placing it on the market, but instead is the product of **Practical Experience**. The old adage "necessity is the mother of invention" is true in every sense of the word in this particular case. This screen is the result of the serious obstacles encountered in endeavoring to screen shale and fire clay for semi-dry pressed brick, and its work proves that it is worthy of its name—**Perfect**—for no dry pan can grind shale or fire clay or any other clay as moist as it can be screened on **The Perfect Clay Screen**. This screen enables its users to get more clay and a finer grade and with more moisture than any other make, in fact it is the only **Clay Screen** on the market. The commendable features of this screen are that it cannot be **pasted** over and **perfectly separates** all the clay to the full size of the perforations. Bear in mind that each and every one is fully guaranteed, no payment required until purchaser is satisfied. Taking into consideration that 10 of these screens have been sold since January 1st, is evidence that our claims can be substantiated by our patrons. Write for full description, prices and terms.

ELDER & DUNLAP, Bloomington, Ill.

The "PEERLESS" UP-DRAFTKILN.

For Burning...
DRY PRESSED,
RE-PRESSED,
ORNAMENTAL or
COMMON BRICK.

Write for
Circulars,
Testimonials or
Information on
Economical
Burning to



Built 30 feet Wide.

J. W. CARSON, LaPrairie, P. Q., Can.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marletta, Pa.

Chenoa, Ill.



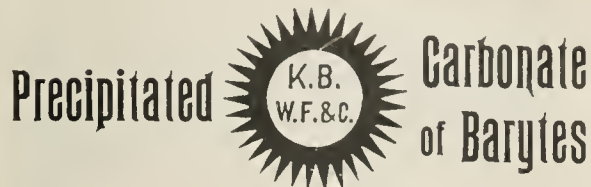
GABRIEL & SCHALL

P. O. Box 2654.

205 Pearl Street.

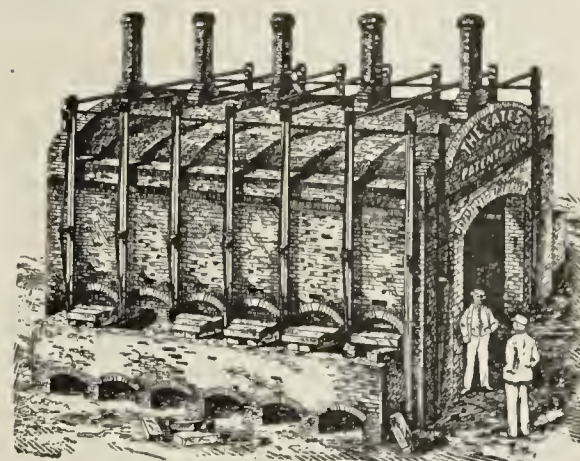
NEW YORK.

Sole Importers in the United States of the



The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.



For Economy of Fuel and Percentage of Hard Burned Brick.

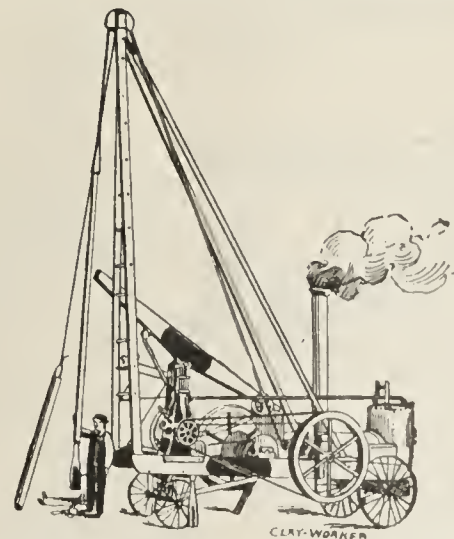
This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES, Johnsonburg, Penn.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.



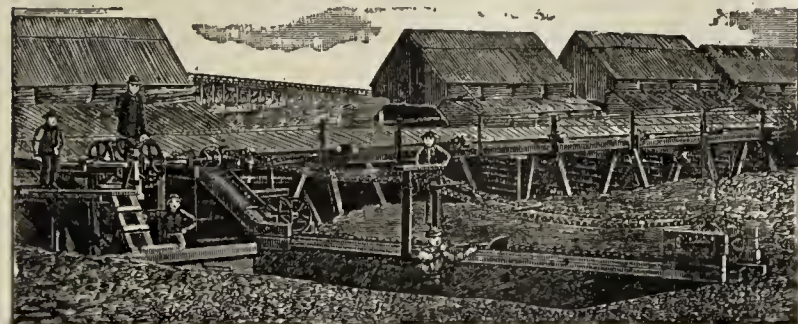
Mey Detachable Chain Belt.



Ewart Detachable Chain.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

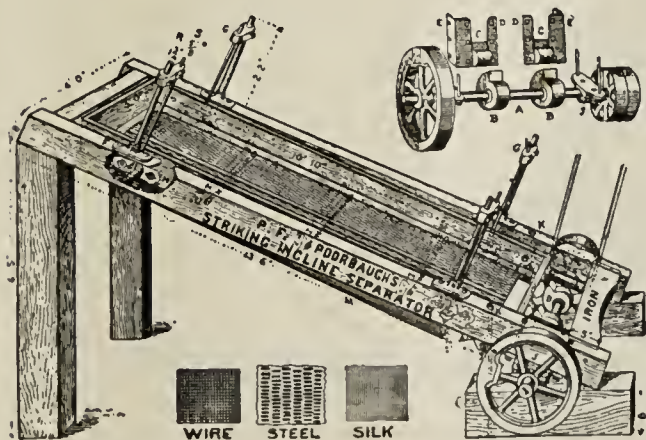
Make
Many More
Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

STRIKING INCLINE SCREEN

For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.



WIRE STEEL SILK

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

PITTSBURG, PA

STUDY MEDICINE AT HOME THIS SUMMER.

We instruct by correspondence. Devote your evenings to study and we do the rest. By our method, success comes easy to you. You cannot afford to miss this opportunity. Address for particulars, Indianapolis School of Medicine, 24 Pennsylvania St., Indianapolis, Ind.

Architecture



Learned by study at home in your spare time. Able instructors. Superior textbooks free. Fees moderate.

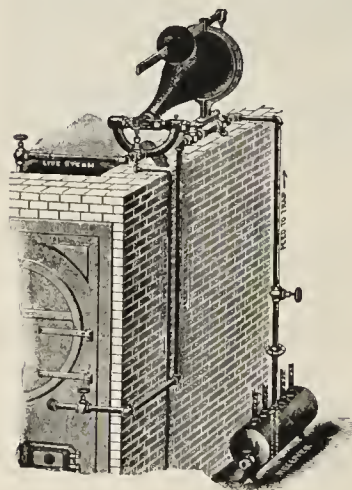
\$2 in ADVANCE and \$2 a MONTH
Pays for a College Education at Home.

Established 1891. 35,000 students and graduates. Courses in Steam, Electrical, Mechanical or Civil Engineering; Mathematics; Chemistry; Mining; Architectural or Mechanical Drawing; Surveying; Plumbing; Metal Pattern Drafting; Prospecting; Book-Keeping; Shorthand; English Branches.

References in every city and town. All who study guaranteed success. We have helped thousands to better positions. Circular free. State subject you wish to study.

INTERNATIONAL CORRESPONDENCE SCHOOLS,
Scranton, Pa.

Return Trap



For returning direct to Boiler the condensed Steam from the steam dryers, etc.

Positive and Automatic.

Economical.

If you are using steam apparatus, particularly a steam dryer, I can save you good money.

For particulars write to

A. SORGE, Jr.,
1021 Monadnock Block, CHICAGO, ILL.

**The Henry Martin
Brick Machine Mfg. Co.,**
Lancaster, Pa.

Machine Brick Moulds a Specialty.

With the latest improved machinery, and the best of skilled help and the very best material we are enabled to furnish moulds better and cheaper than any other make.

Send sample order.

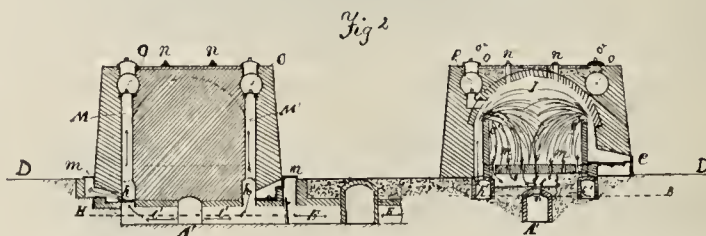
PRICES:

Steel bound machine moulds,
5 or 6 brick \$1.75 each
With Steel Lined Heads,
5 or 6 brick \$2.00 each
With Panel Bottoms, solid bottoms, 5 cents per
brick extra.

S. GEYSBEEK, Ceramic Chemist,

New Brighton, Pa.

The Down Draft Continuous Kiln.



This kiln is fired by suitable furnaces on each side of the tunnel, no fuel comes in contact with the clay ware, no firing through the top, no refraction from the down draft whatever; it saves as much fuel as the old Continuous fired through the top. It is adapted to use any suitable kind of fuel to

burn clay ware. The automatic draft regulator assures an even draft at all times in every compartment in operation. The cooling of the clayware is fully controllable in the hand of the burner at will. The draft of the advance heat and combustion through the floor is connected from compartment to compartment until the heat is taken up by the wares before leaving the stack. The heat from the cooling compartments are drawn to the compartments for steam drying the green wares. For small yards it is not necessary to construct the full kiln, only build compartments as is necessary for the output and if the demand requires more kiln room, extend any time later. I guarantee that my Kiln will burn as clear color, sound enameled clay ware as any other down-draft kiln in use. Parties intending to improve their product and profit should not fail to correspond with me in regard to cost of construction and license right, which I will give for a reasonable living price. In corresponding, state the kind of material manufactured, also daily capacity, to the Inventor and Patentee,

C. F. KAUL, Madison, Neb.

Roofing Tile is Coming....

➔ THE MACHINE TO MAKE
IT HAS ARRIVED.

A simply and very economical way of making Clay Shingles or Roofing Tile is found by using the machinery covered by recent patents granted to A. H. Murray and C. S. Welch. This industry is completely revolutionized by reducing the cost of manufacture to a nominal sum compared with the cost under the crude and expensive methods heretofore in use. This machinery is now ready for the market, and it has been thoroughly tested and is in practical operation to an extent that places it beyond a doubt of its practicability. Only territory east of the Mississippi river open. Correspondence solicited.

For full information address

MURRAY & WELCH, Huntington, W. Va.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and... MACHINE MOULDS

We manufacture the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis

Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily \$1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually \$1.00 for any single list.

ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?

TO KNOW how to sell BRICK to the Government?

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,

ESTABLISHED NINE YEARS.

Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael

Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

Wellsburg, W. Va.

Fourteen (14) sold already this Season.

Standard Dry and Wet Pans

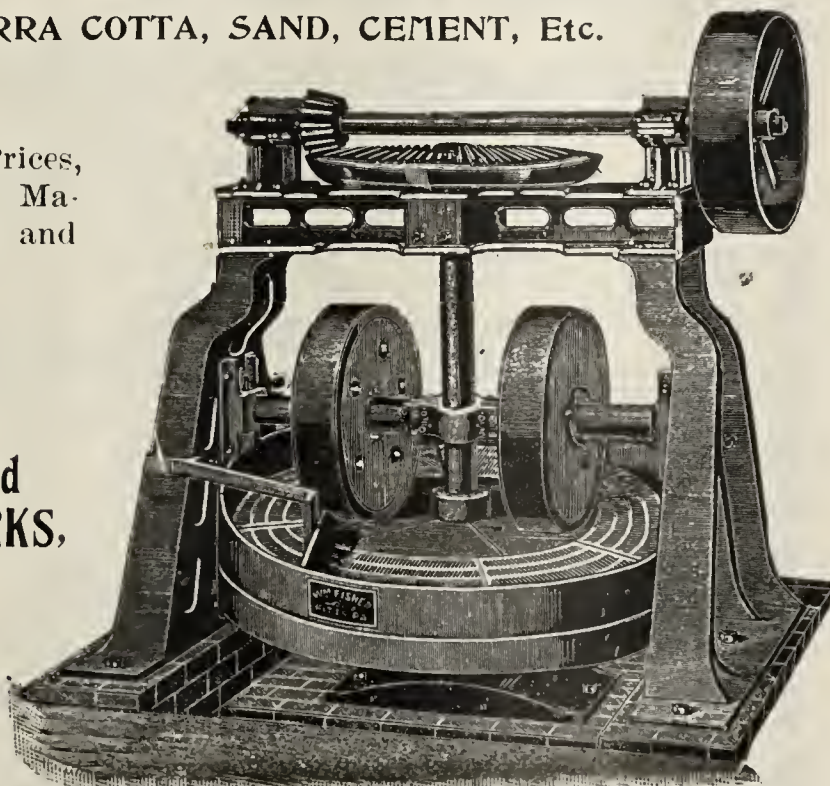
For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

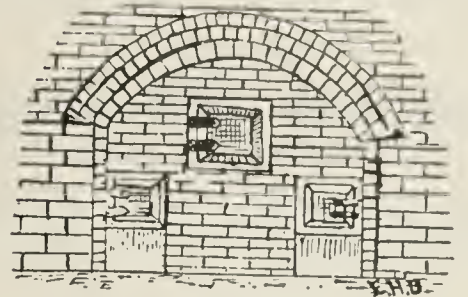
FISHER ENGINE FOUNDRY and MACHINE WORKS,

Phillips & McLaren, Proprietors,

24th and Smallman Sts., PITTSBURG, PA.



Swift's Kiln Furnace,



F. E. SWIFT'S PATENT SLACK COAL COKER, GAS GENERATOR AND SMOKE CONSUMER.

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn.



Fires not disturbed but once in 10 hours till water-smoke is off. Guaranteed to water-smoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to investigate—I can save you good money.

For further particulars, address

F. E. SWIFT, Washington, Iowa.

Steubenville Foundry and Machine Works....

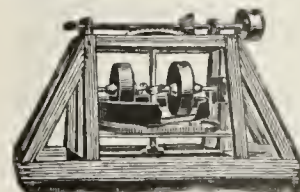
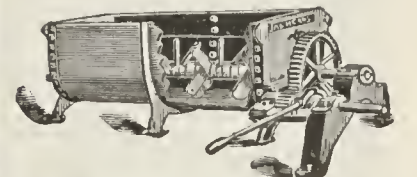
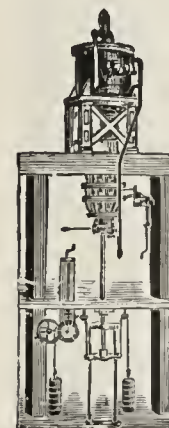
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Manufacturers of

STEAM SEWER PIPE PRESSES

Of different sizes, making from 2 to 30-inch pipe inclusive.

Pipe, Brick, Tile, Copping, Fire Proofing and Building Block Dies.



CLAY GRINDING AND TEMPERING PANS AND PUG MILLS.

Feed Screws for Mining Clay; Steam Engines and every variety of Iron and Brass Castings, Shafting and Pulleys.

Send for circulars and estimates.

JAS. MEANS & CO., Steubenville, Ohio.

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POPULAR

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Six trains every week day. Parlor chairs and
Cafe cars on Day Trains.Dayton Line 5 trains every week day
to Dayton.Fast time between Indianapolis and Colum-
bus and Pittsburg.Through Sleeping Cars to Washington, Balti-
more and Philadelphia, via B. & O. Railway.Michigan Line 2 trains every week
day to Toledo.Two trains every week day to Detroit. Vesti-
buled Sleeping Cars on night trains.

G. W. Hayler, D. P. A., Indianapolis, Ind.

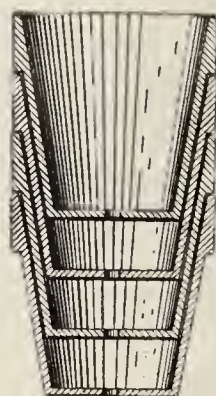
D. G. Edwards, Passenger Traffic Manager.

IT CUTS
SOME ICE
the kind of "CUTS"
you use;
Poor ENGRAVINGS
will spoil your cata-
logue or advertise-
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WE MAKE THE GOOD KIND.
IND'PL'S ENGRAVING
AND ELECTRO' CO.
36 E Washington St.

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Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

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| 6,000 two-inch Pots; | 3,500 five-inch Pots; |
| 4,000 four-inch " | 2,000 seven-inch " |

Write for Circular and prices.



The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



"LEVIATHAN."

"Upon Earth There is not His Like."

Sept..... 1896.

MAIN BELTING CO., 55 and 57 Market St., Chicago, Ill.

Gentlemen:—Please ship us via freight, 146' x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige.

Yours very truly,

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

Main Belting Company,

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PHILADELPHIA:
1219 Carpenter Street.BOSTON:
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Power-Transmitting Machinery.

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Specialties for Handling
Material of
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GENERAL MACHINISTS,

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C A L D W E L L S CHICAGO.
C O N V E Y O RCALDWELL
Steel Conveyor.Manufactured exclusively by us at Chicago, with latest
improvements

Send for Catalogue.

CALDWELL-AVERY SEAM-
LESS STEEL ELEVATOR
BUCKETS.

LINK BELTING.
SPROCKET WHEELS
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RUBBER BELTING.
LEATHER BELTING.
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ELEVATOR BOOTS
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TAKE-UP BOXES.
TURN HEAD SPOUTS.
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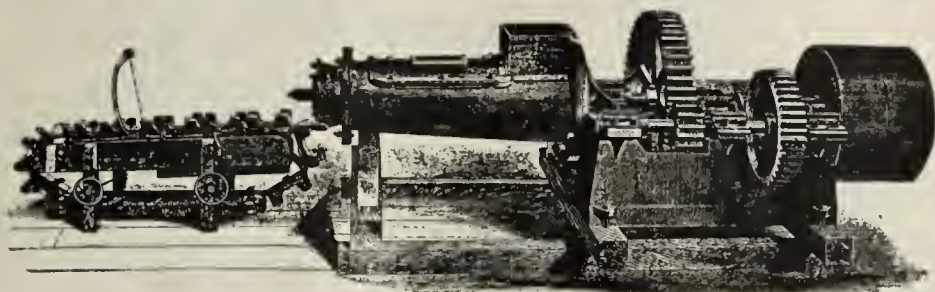


MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

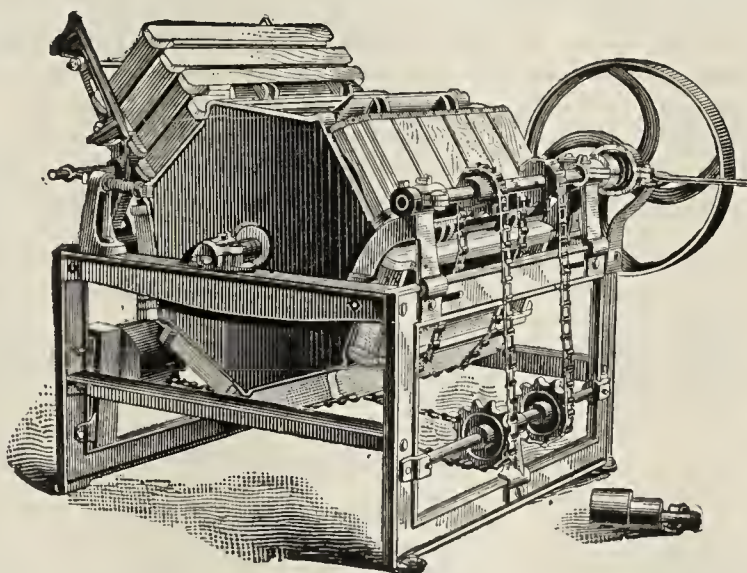
MADDEN & CO., Rushville, Ind.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



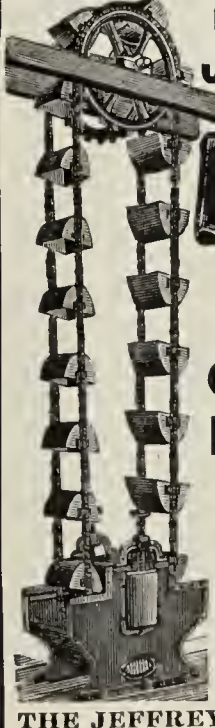
The case of Newton vs. Buck, has again been decided, February 4, 1898, by Judge Cox, in the United States Court, holding that Newton is the owner of patents, Nos. 284,115; 301,087; 272,698; and 407,030, and has the exclusive right to manufacture machines under these patents, and entitled to an injunction against Buck and all persons claiming through or under him, from making, using or selling the Buck machines, and for damages for past infringements. This is absolutely the end of the long litigation between Newton and Buck and every point is decided in favor of Newton.

We own and control nine patents, and all sanding machines employing either the cylinder or the feed rack, infringes some one or more of these patents, and all persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages against all infringements.

Elevators

For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.



JEFFREY



Roller, Steel and Special CHAINS
—FOR—
**ELEVATING
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CONVEYING
MACHINERY**
FOR HANDLING MATERIAL OF ALL KINDS.
Power Transmission Machinery.
COAL MINING MACHINERY.
WIRE CABLE
CONVEYORS.
For long and
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THE JEFFREY MFG. CO., Columbus, Ohio.
Send for Catalogue. 163 Washington St., NEW YORK.

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Manufacture
SHAFTING,
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CLUTCHES,
BUCKETS,
BOOTS,
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What do YOU know about
Bricks, Tiling, Pottery?
WE know ALL about
SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road.

For particulars write
J. ST. KOSLOWSKY,
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Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and
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Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.
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No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
No. 23 Passenger..... 2:50 p. m.
No. 25 Passenger..... 6:20 p. m.
*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
A. H. SELLARS, Agent,
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C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

TAKE THE
BIG 4
TO
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Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD, JACKSONVILLE and HANNIBAL, MO.

Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

| | |
|-----------------------|-----------|
| Mail and Express..... | 8.15 a m |
| Accommodation..... | 3.45 p m |
| Fast Express..... | 11.10 p m |

ARRIVE.

| | |
|-----------------------|-----------|
| Fast Express..... | 3.35 a m |
| Accommodation | 10.40 a m |
| Mail and Express..... | 4.40 p m |

JNO. S. LAZARUS, Gen. Pass. Agent.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

| LEAVE
INDIANAPOLIS, | AT. TERRE
HAUTE | AR. ST.
LOUIS. |
|------------------------|--------------------|-------------------|
| * 7:20 am | 10:05 am | |
| * 8:10 am | 10:15 am | 3:15 pm |
| * 12:40 noon | 2:35 pm | 7:12 pm |
| * 7:00 pm | 9:04 pm | 1:44 am |
| * 11:20 pm | 1:30 am | 7:00 am |
| *Daily. | | |

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns WANTING INDUSTRIES

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

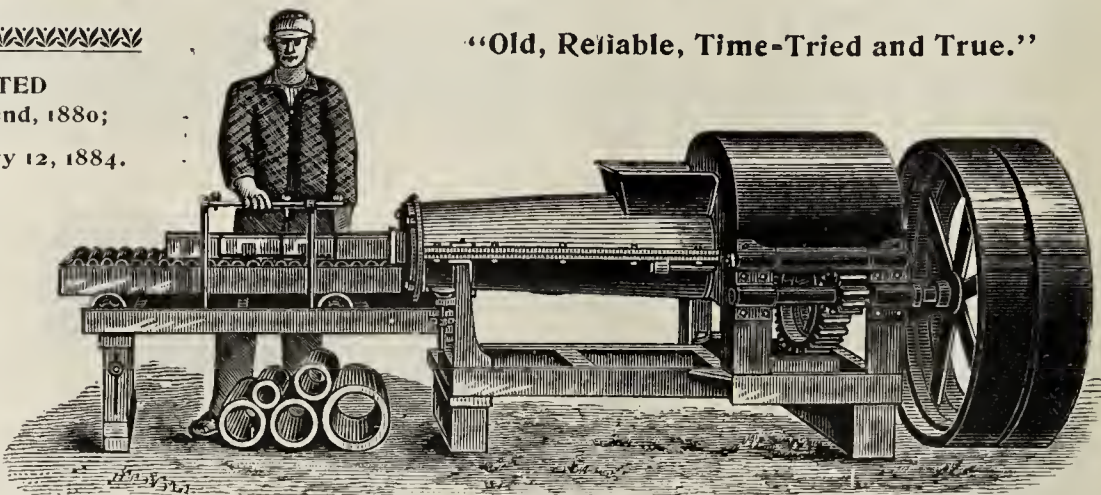
To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED

June 22nd, 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

Still Further Testimony!

Soft Mud Brick Dried in 10 or 12 hours.

Most trying service with large brick of tough clay that is liable to "check," and slow to dry.

The great circulation of air does it, as of out of door drying, at low temperature. The correct principle, successfully adapted and demonstrated. Saves more time than the locomotive over the stage coach; with fans and machinery, inside and close to the work, that pay well and cost no trouble to run, as users attest.

The fans save in cars, pipe and enclosure to make the first cost less than half that of other dryers, and in continuous use less than one-fourth of the fuel in using engine exhaust steam only for heating—much more of it, and without back pressure.

SOMERSET, MASS., Nov. 22nd, 1897.

TO WHOM IT MAY CONCERN:

This is to certify that S. G. Phillips' "Inside Fan Dryer," has been in operation at our works for a period of over a year, and continues to give good satisfaction, drying our pressed brick for enamelling in ten hours without warping or checking.

A vacuum guage at the feed water heater shows our variable cut-off engine to be made condensing, and it is safe and not over estimated in any point of view, to say the Dryer is working all right and costing no extra power or firing, as we do our former work and yet are saving 20 per cent. in our fuel bill.

No heating means is employed other than the exhaust steam from the engine, and that which the radiators do not take, passes on to the stove or dry floor, being used as before.

The above drawing, showing the general arrangement of the feed water heater, gauges, exhaust steam pipes, valves and two dryers, is in all essential respects, correct.

SOMERSET ENAMELED BRICK CO.,

By Warren H. Sanford, Agent.

BRISTOL COUNTY, SS. Nov. 22nd, 1897.

Then personally appeared Warren H. Sanford above named and made oath that the foregoing statement by him signed is true.

[SEAL]

Before me,

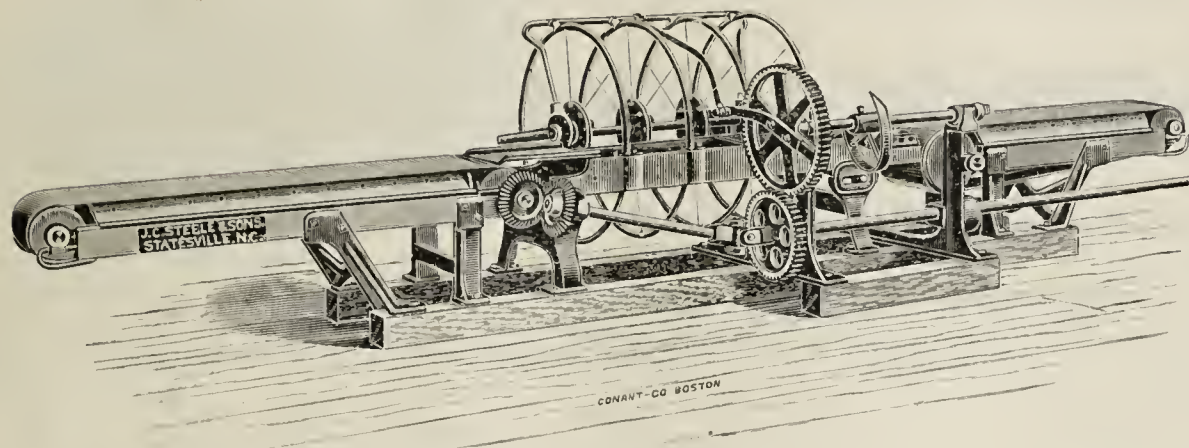
J. C. BLAISDELL, Notary Public.

S. G. PHILLIPS, Agent and Patentee, 161 Grand Street, Rahway, N. J.

The "New South" Brick Machinery

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.



Automatic Cutting Machine.

Bluff Springs, Fla., Dec. 9, 1897.
J. C. Steele & Sons, Statesville, N. C.:
Gentlemen:— We have been running your "Xtra" Machine with Automatic Cutter for sometime and they do excellent work. The Machine tempers clay beyond our expectations, and the Cutter, we believe is as near perfection as is possible to make it. Any one wishing a simple Machine and Cutter should investigate yours before placing their order. At any time we will be pleased to answer any questions in regard to them.
Yours truly,
J. W. CARY, JR., & Co.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

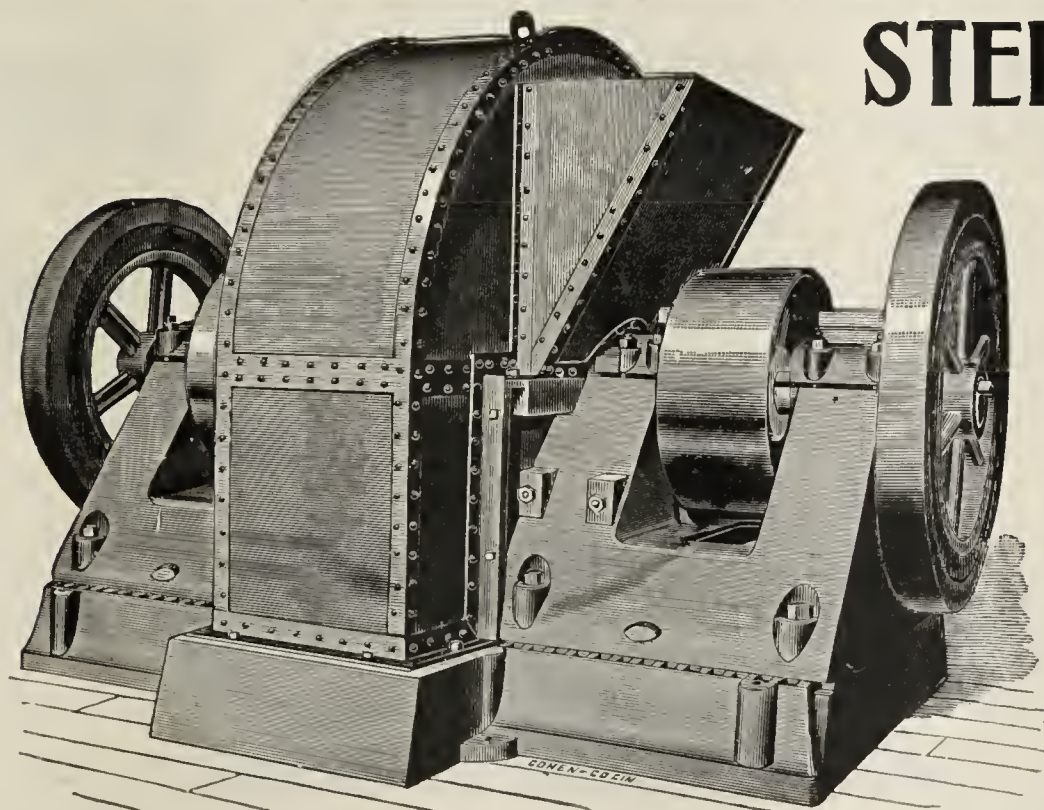
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

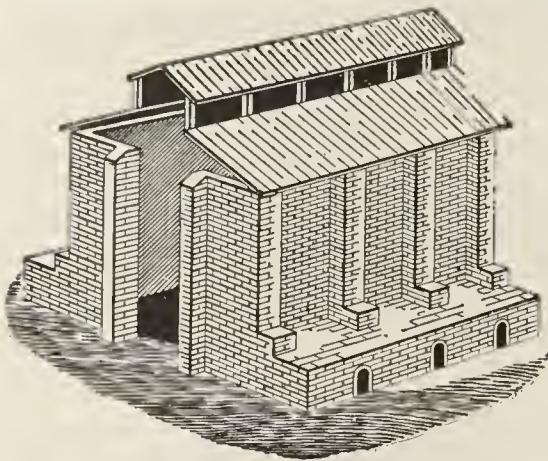
Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

LOUIS H. REPELL'S IMPROVED-KILNS

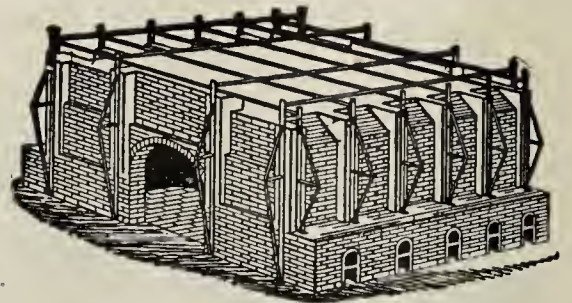
For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

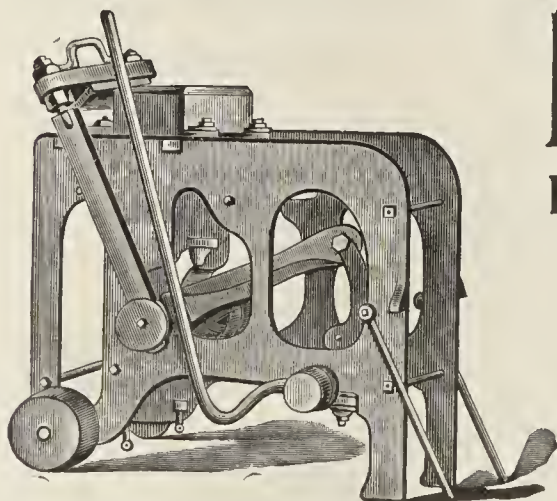
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

Days Brick Works.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,

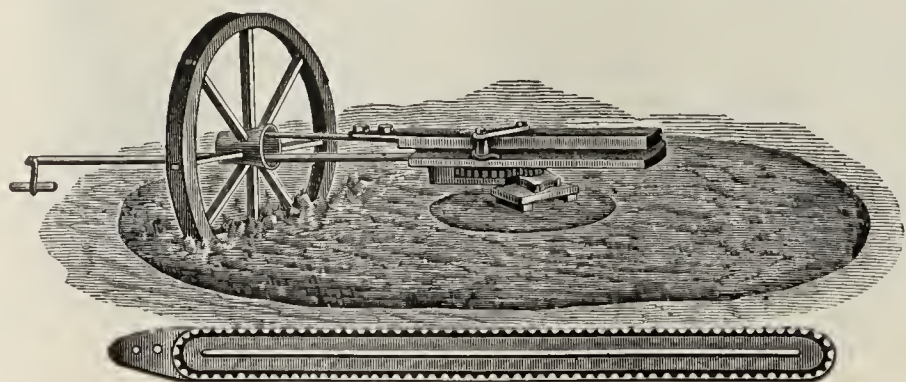
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



WOULD like to show you also my new Kiln Floor for Round or Square Down-draft Kilns. It is a permanent floor, to any one who has to use sand in sanding their brick it is a money saver, a floor can be cleaned in two hours without moving any brick; and fuel is saved in the burning of the product, and a great deal of annoyance saved in releveling etc., for dry pressed and other high grades of brick.

Address **H. HAIGH, Catskill, N. Y.**

The Lehmann ^{Portable} _{Continuous} Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

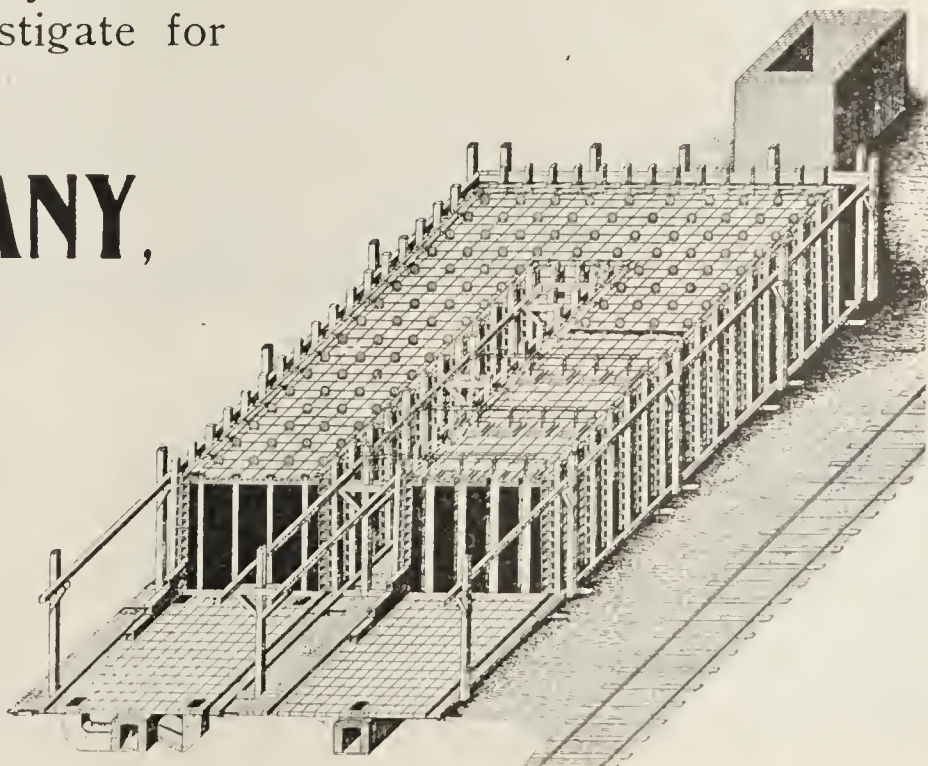
F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,
Plans and estimates furnished for Brick, Lime and
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.



Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

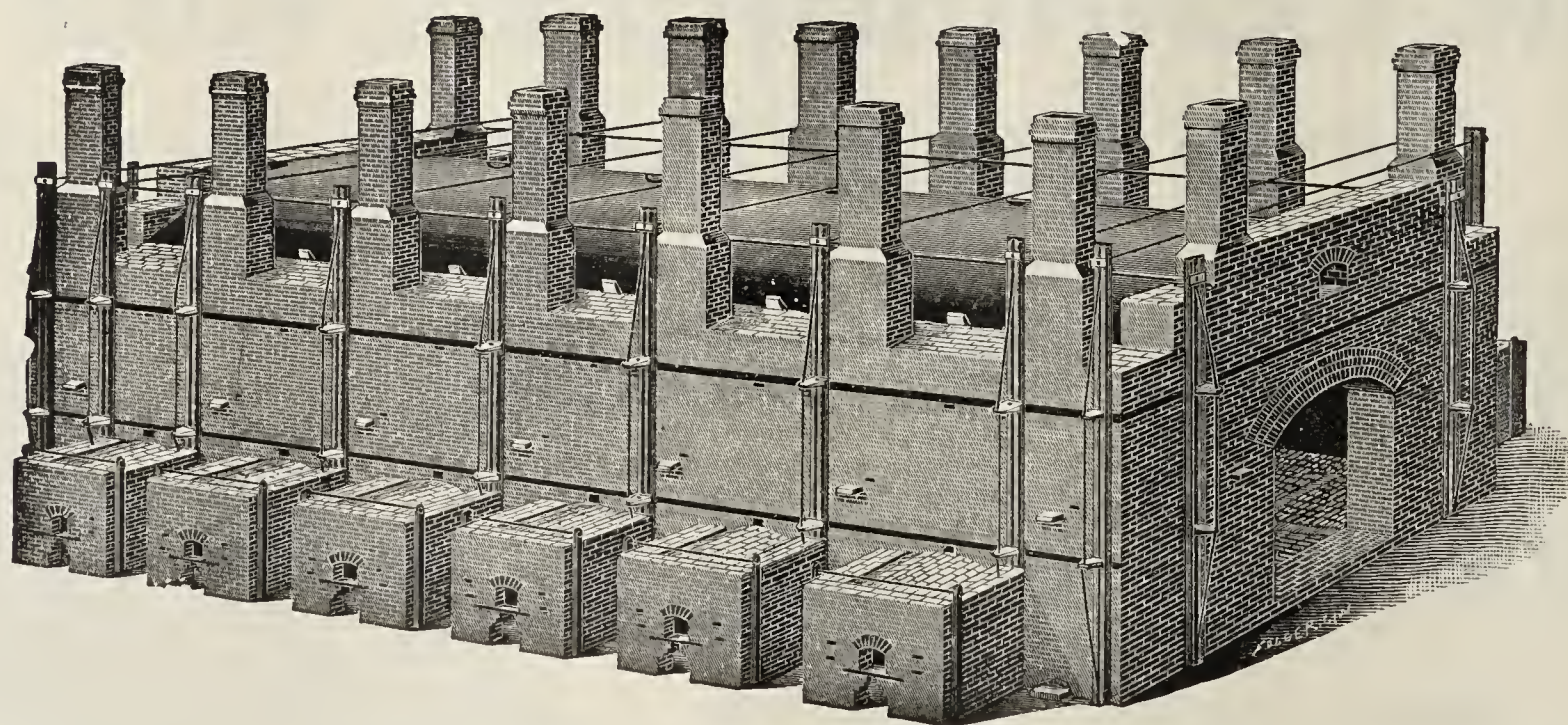
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

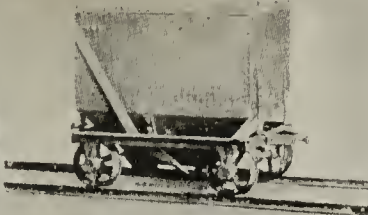
We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



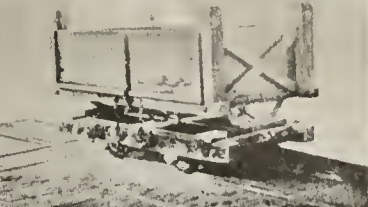
No. 146. TURNTABLE.



No. 150. STEEL BOTTOM DUMP.



No. 170. STEEL SIDE DUMP.



No. 201. OAK SIDE DUMP.



No. 142. TRANSFER CAR.



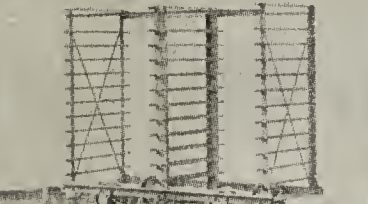
No. 124. DOUBLE DECK.



No. 126. D.D. STEEL DECK.



No. 136. 3 SECTION RACK.



No. 133. SOFT MUD RACK.



No. 140. BOX SHOCKS, Etc.



No. 139. SHINGLES, STAVES, Etc.



No. 105. SOFT MUD FLAT.



No. 103. STIFF MUD FLAT.



No. 108. FLAT, STEEL DECK.

THE ATLAS BOLT & SCREW CO.,
CLEVELAND, O., U.S.A.

MANUFACTURERS OF

STEEL BRICK DRYER CARS,

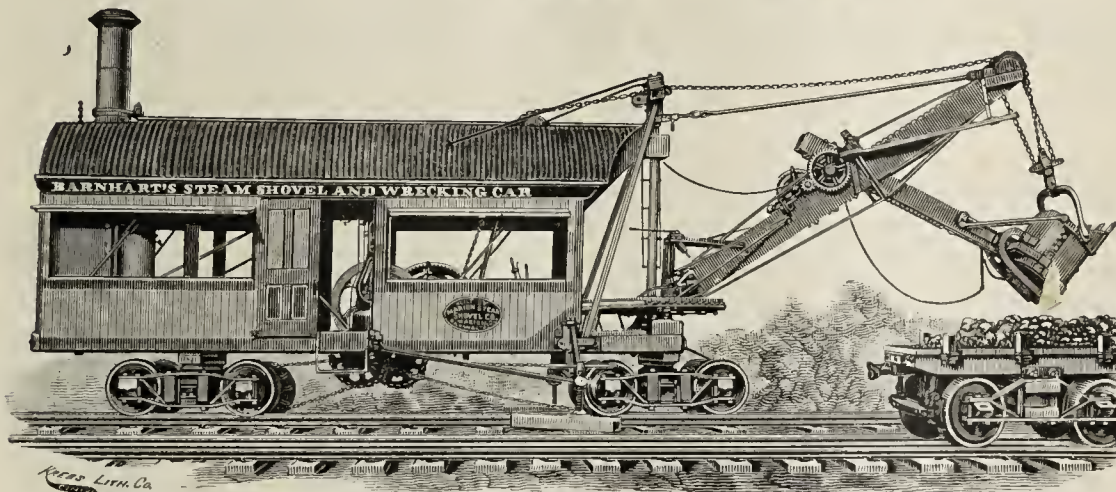
SMALL CARS OF ALL KINDS,

STEEL DRY KILN, LUMBER TRUCKS,

STRONG, LIGHT AND EASY RUNNING.

FULL LINE STEEL WHEELBARROWS.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

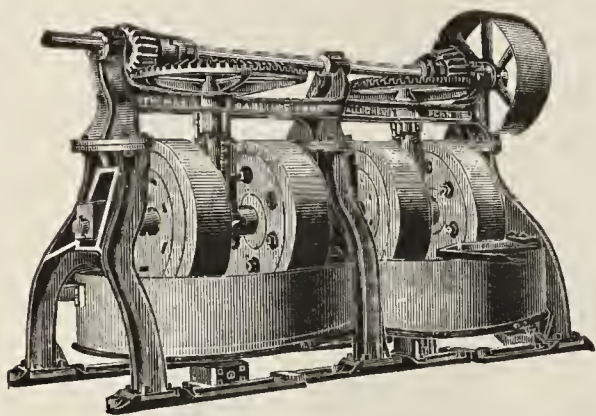
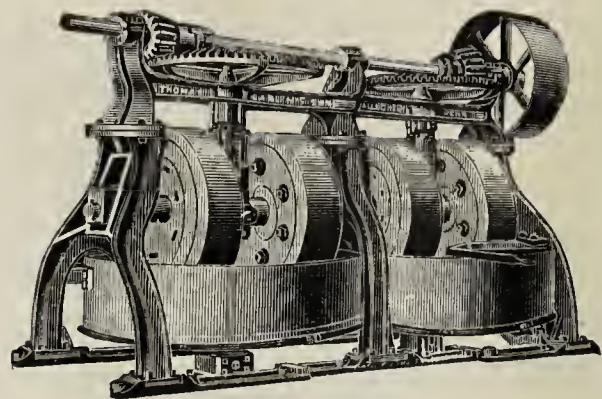
OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C—¾ YD.

CARLIN'S DRY PANS are

The Best and the Cheapest Dry Pans on the market. They are the **Cheapest** because they are the **Best**. Carlins' Dry Pans are built for service and capacity. Ask those who are using Carlin's Dry Pans and they will tell you they are the **best and cheapest** pans made. We make several different sizes. If you are going to buy a Dry Pan and want the best value for your money don't fail to get our prices and terms.

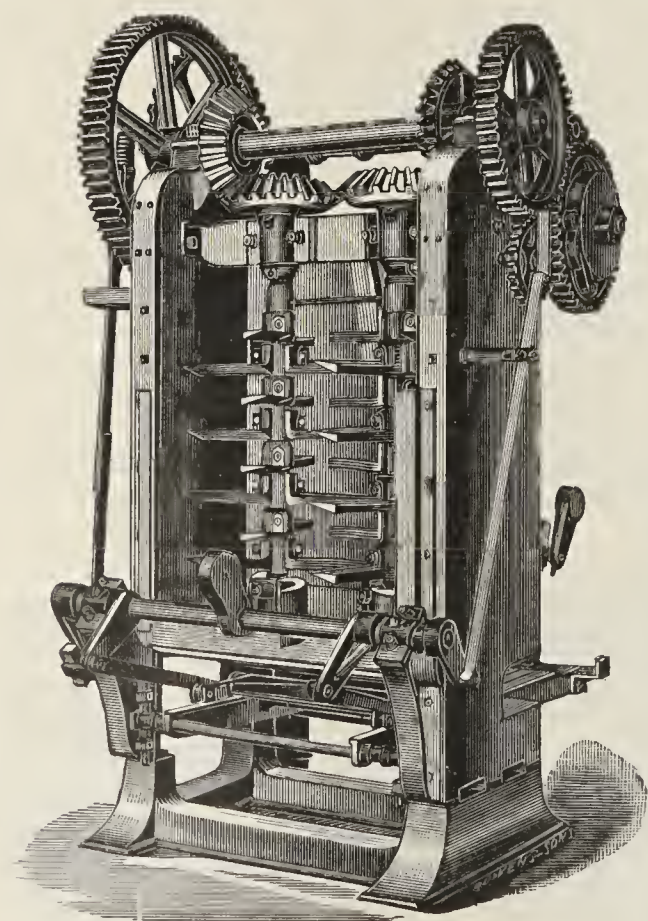


We also sell **Engine Boilers, Pallet Cars, Revolving Cranes, Conveyors, Hoisting Machinery, etc.**

Thomas Carlin's Sons,
ALLEGHENY, PA.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



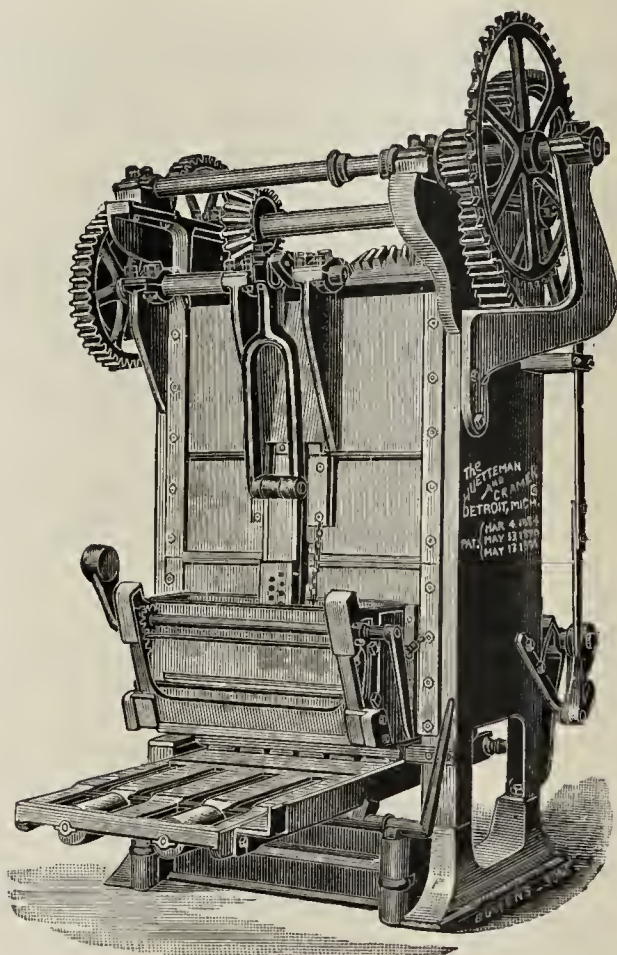
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

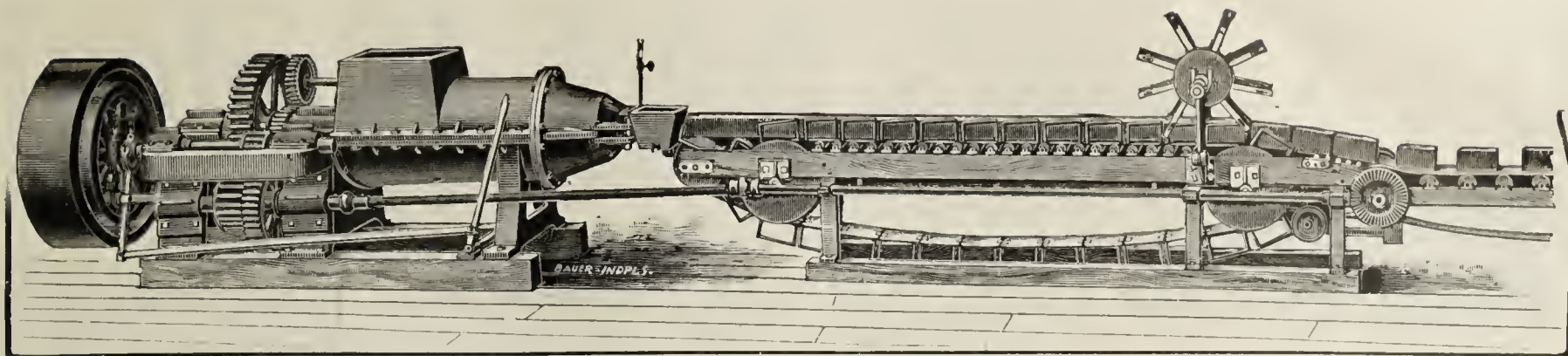
WRITE FOR CATALOGUE
AND PRICES TO

**The Huetteman
& Cramer Co.,**

Manufacturers of the Duplex Brick Machine and general outfit for brickyards,

12, 14 & 16 Sherman St.,
DETROIT, - - MICH.



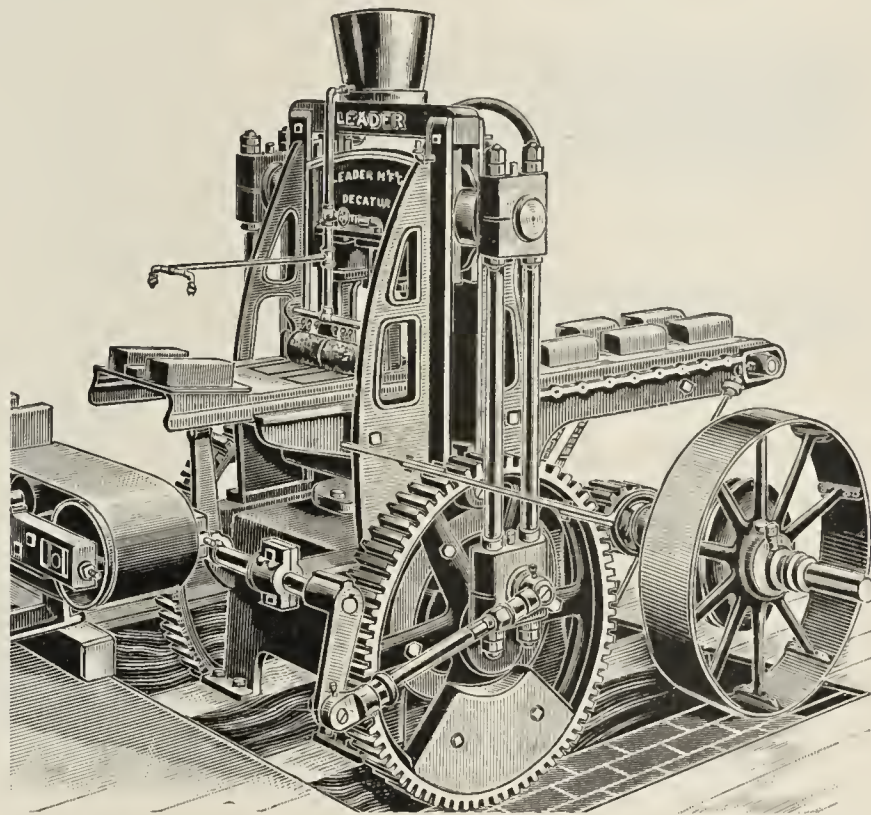


OFFICE OF
THE TUTTLE BRICK COMPANY,
Manufacturers of
Paving and Building Brick.

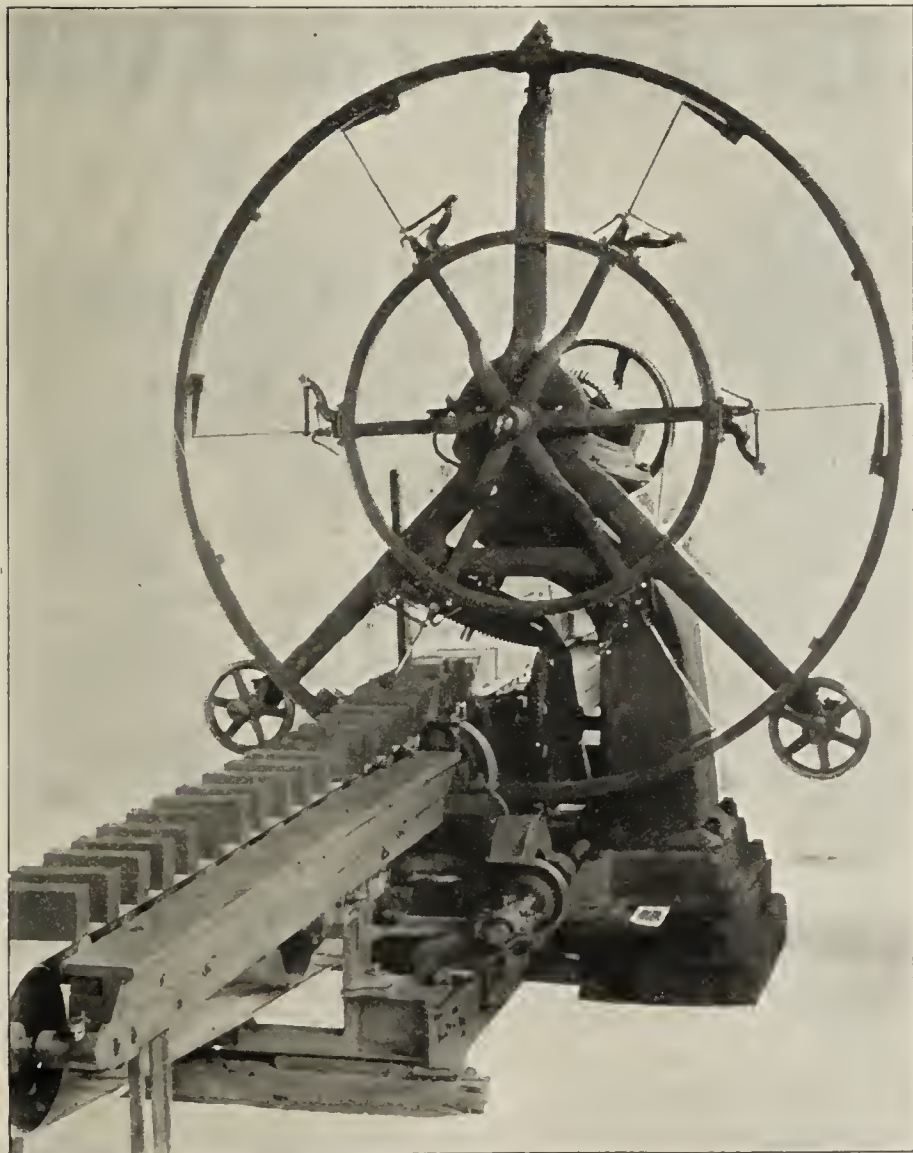
Decatur, Ill., January 28th, 1898.
LEADER MFG. CO., Decatur, Ill.
Gentlemen:—We have been using a complete outfit of your brick machinery, with the exception of Represses, for several years. Each individual machine has performed its work in a manner highly satisfactory to us.
The Repress you furnished us last year has been doing the work usually allotted to two presses without signs of detriment to it and you may expect an order from us in a few days for another LEADER REPRESS. It has paid us to use your machinery in the past and we will continue to do so in the future. Wishing you success, we are,
Yours truly,
THE TUTTLE BRICK CO.,
Per S. A. Tuttle.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

Leader Manufacturing Co.,
Decatur, Ill.



Automatic Side-Cutter
For Stiff-Tempered
Brick Machines.



The Chambers Automatic Side-Cutter.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

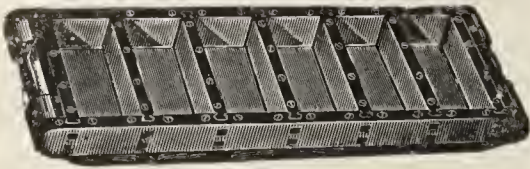
There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

The machinery is above the dirt and all gearing encased.

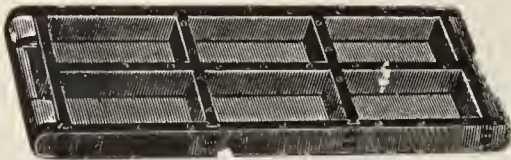
MANUFACTURED and
GUARANTEED. . . .

Chambers Brothers Co.,
PHILADELPHIA, PA.

Do YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold.



3 Brick Hand Mold.

future delivery desired now. We make the best

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see?"

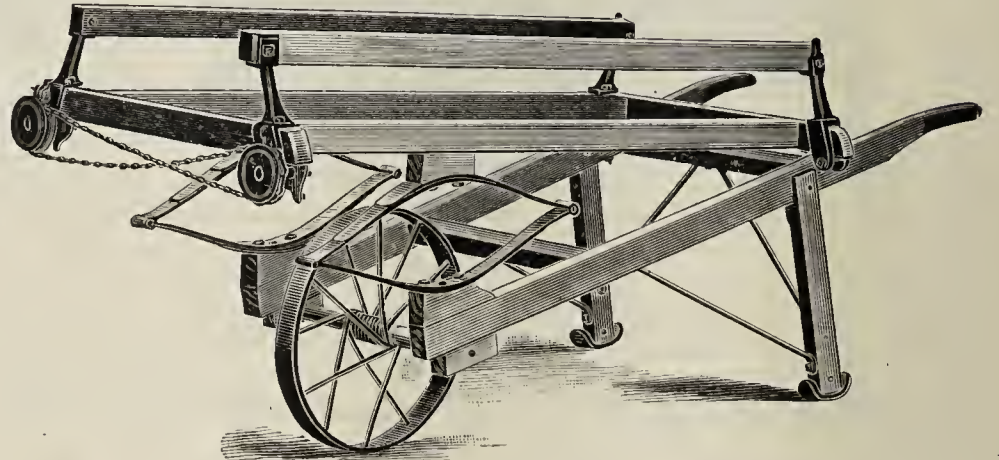
We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

➔ Moulds, Trucks and Barrows,

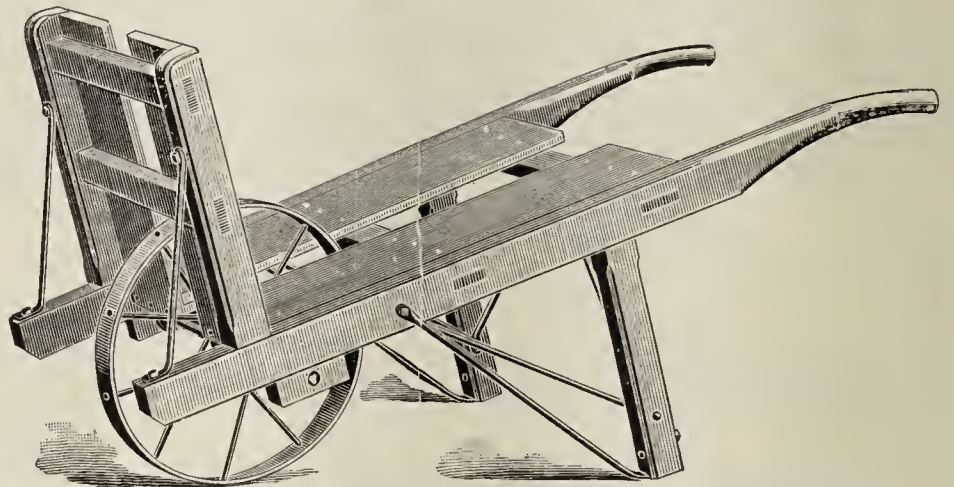
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



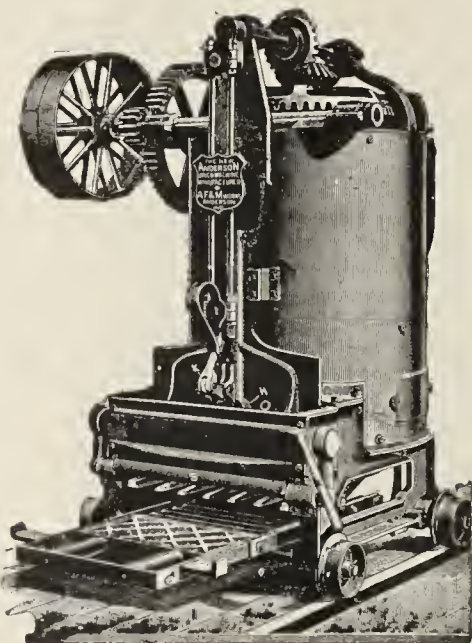
No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

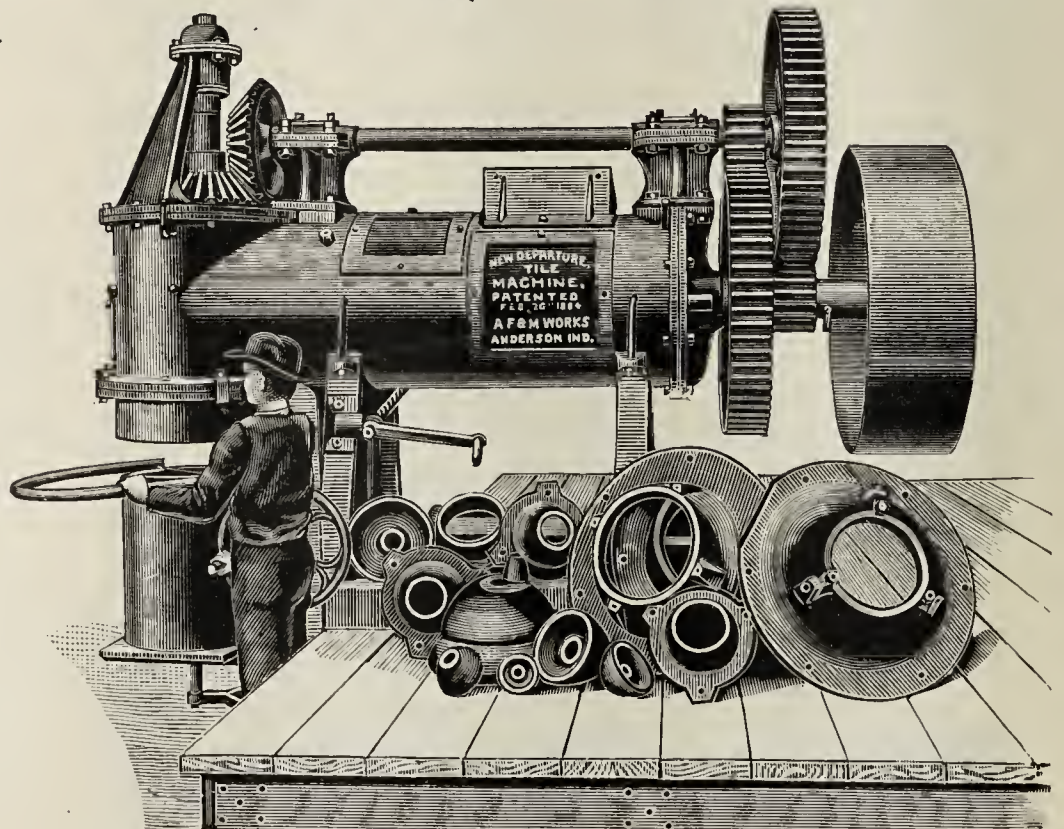
New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

Mighty Interesting!



MIGHTY INTERESTING is our last annual Catalogue but more interesting still are the facts and figures we can pile up to substantiate all claims of superiority made for our machinery. If it's a question of money making qualities we can point out many leading and successful manufacturers of to-day who are using our machines. There is no secret in the success of our line. Each machine embodies correct principles to start on and is built with the utmost care.

Not the smallest bolt or screw in its construction is neglected. All parts are flawless and are made of the very best material. When a machine is completed it is put together in such a way that its successful operation is assured. We take no chances on our machines and ask you to take none. We know that they are **"Built Right and Run Right"** and can prove it to your entire satisfaction if given an opportunity. It doesn't cost anything to talk it over with us. Write us concerning your wants, be they great or small. We can save you annoyance, delays and expense. We manufacture a full line of Clayworking Machinery and appliances.

Our Dry Press Machinery has found popular favor on account of its recognized superiority. Its simplicity, durability, ease of operation and convenient features make friends for it daily.

Our Stiff Mud Machines have no equals. They are **"Built Right and Run Right."** Repair bills never haunt the users of our machines. Half the entire output of stiff-mud brick are made on our outfits.

Our Soft Mud machinery includes the very best and most satisfactory line on the market. We have numerous testimonials from users who largely attribute their success to the fact that their machines are not a constant expense to them.

If you haven't seen our annual catalogue ask for it.



The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

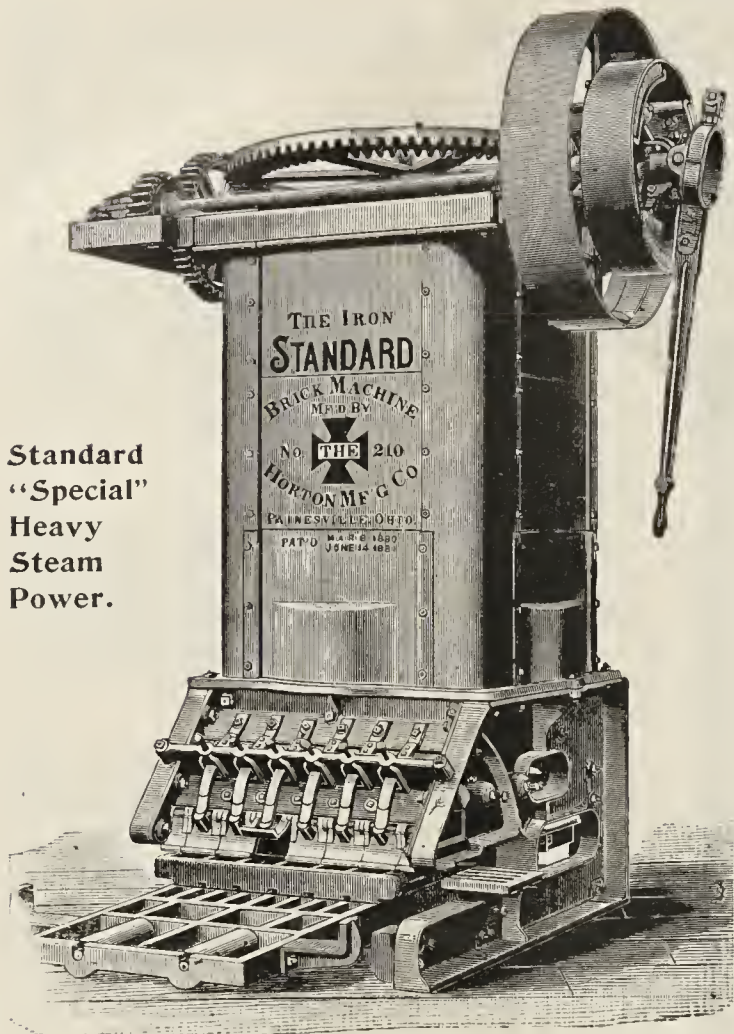
Not Only a Good Machine, But the Best.

This is the universal recommendation by the users of our machines.

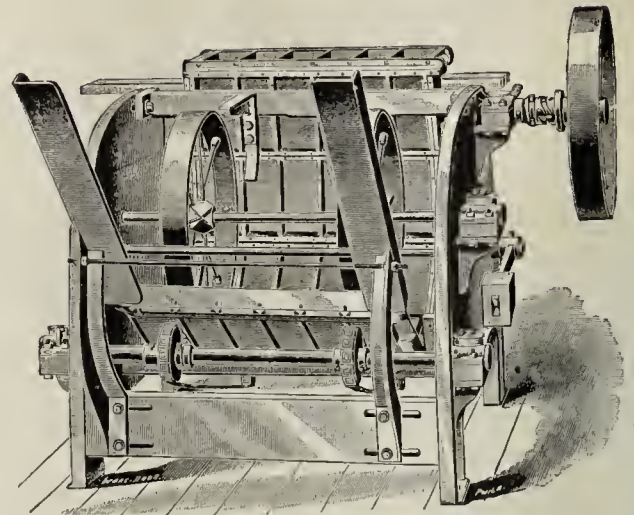
A machine which is simple in construction, powerful in operation, and practicably non-breakable, cannot fail to lead the procession.

SEND FOR
'98 CATALOGUE.

• • •

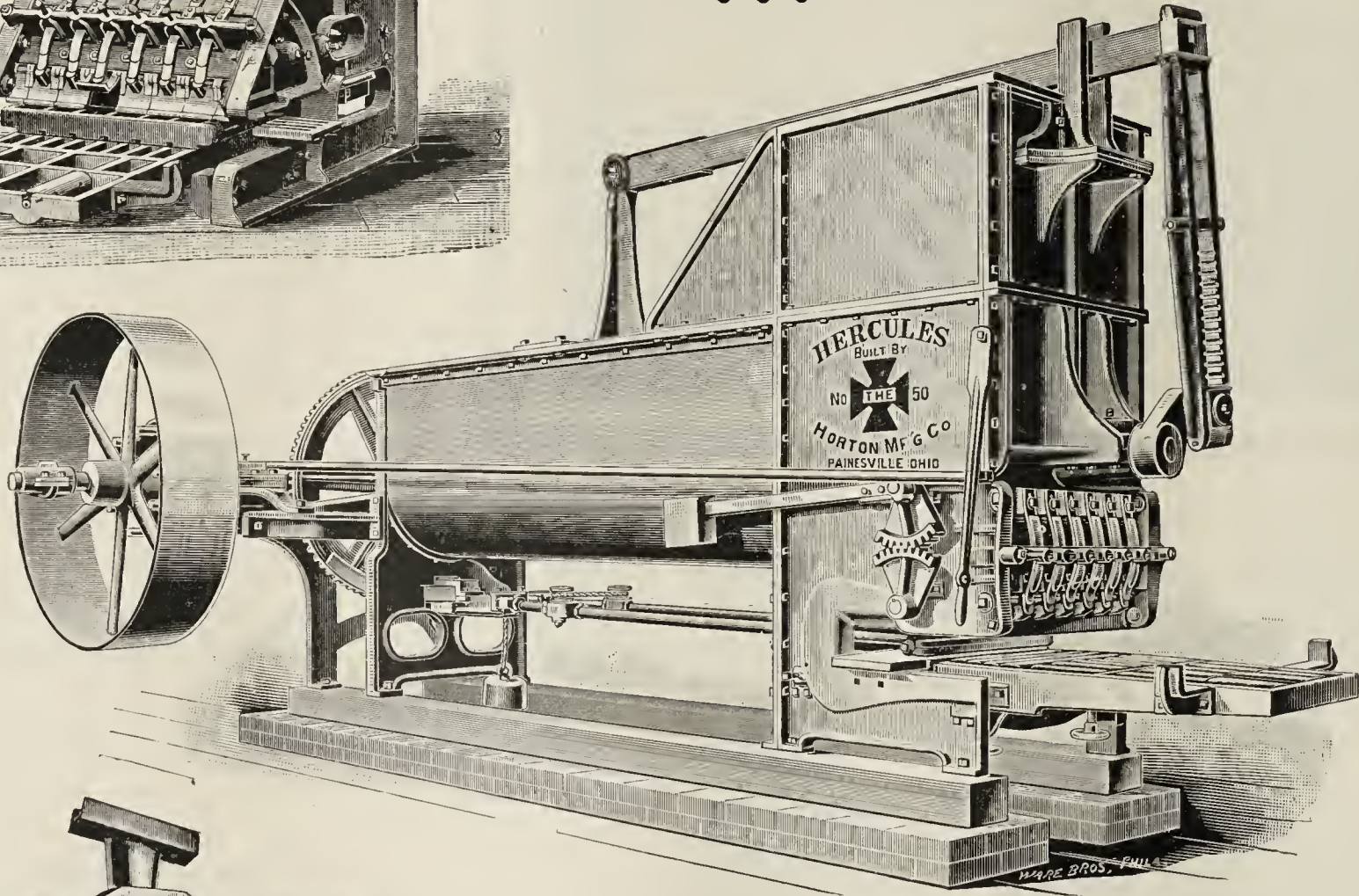


Standard
"Special"
Heavy
Steam
Power.



HORTON MOLD SANDER DIRECT FEED.

Hercules capacity 40,000
to 50,000.
Weight 7½ tons.



We are making a special drive on Molds for
the next 60 days.

C. G. BARKWILL,
H. C. BRADLEY.

Room 231 Arcade.
Telephone Main 559.

BARKWILL & BRADLEY, Brick and Building Material.

All orders subject to strikes and unavoidable delays.

CLEVELAND, March 7, 1898.

HORTON MFG. CO., Painesville, Ohio.

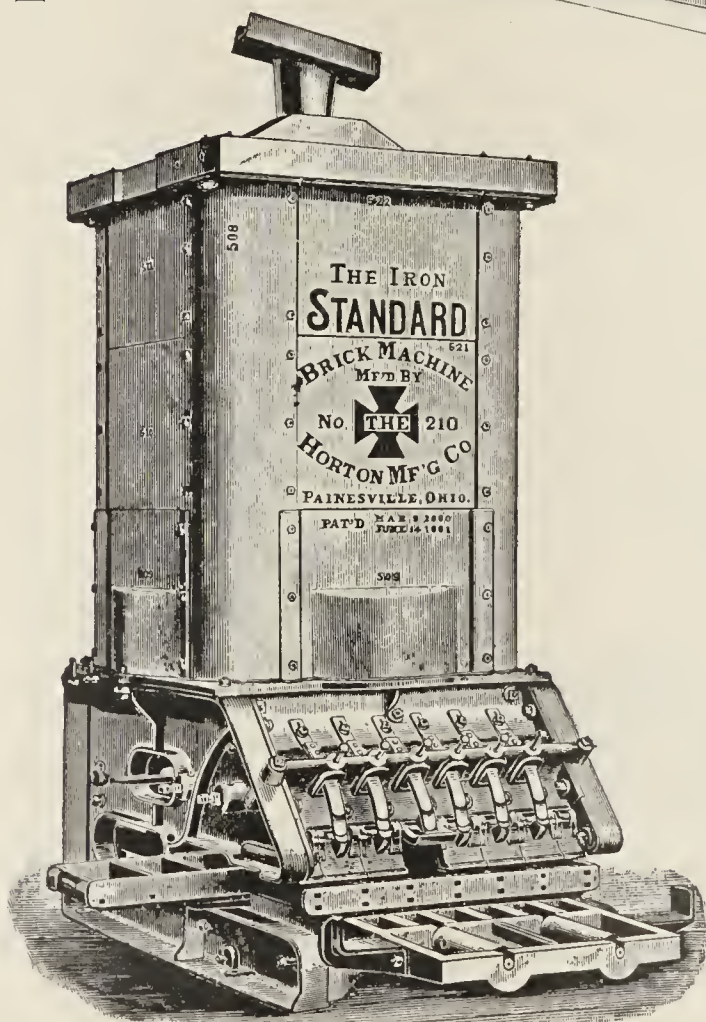
Gentlemen:—We have delayed writing you in regard to the Hercules machine, but we have been very busy replacing our old boilers with new style water tube boiler. We wish to say to you that we think the machine is not only as good a machine as there is in use, **but the best.** We shall start again just as soon as we can get our boilers set, and then will be glad to show any one how it behaves when we are giving it plenty of work to do every day.

Very truly yours,
STANDARD BRICK CO.,
C. H. BRADLEY, Man'gr.

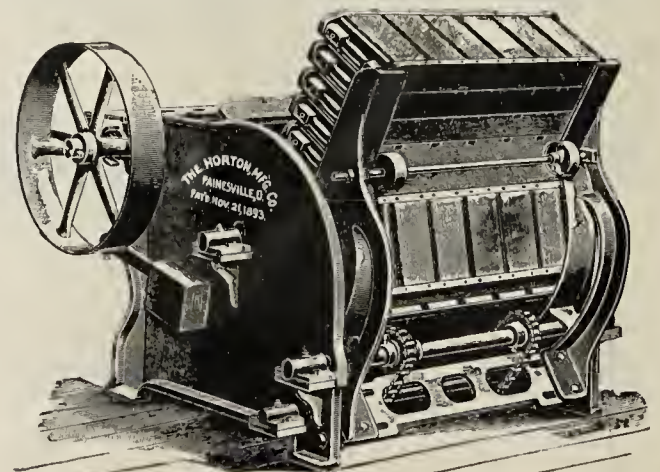
• • •

The Horton
Manufacturing
Company,

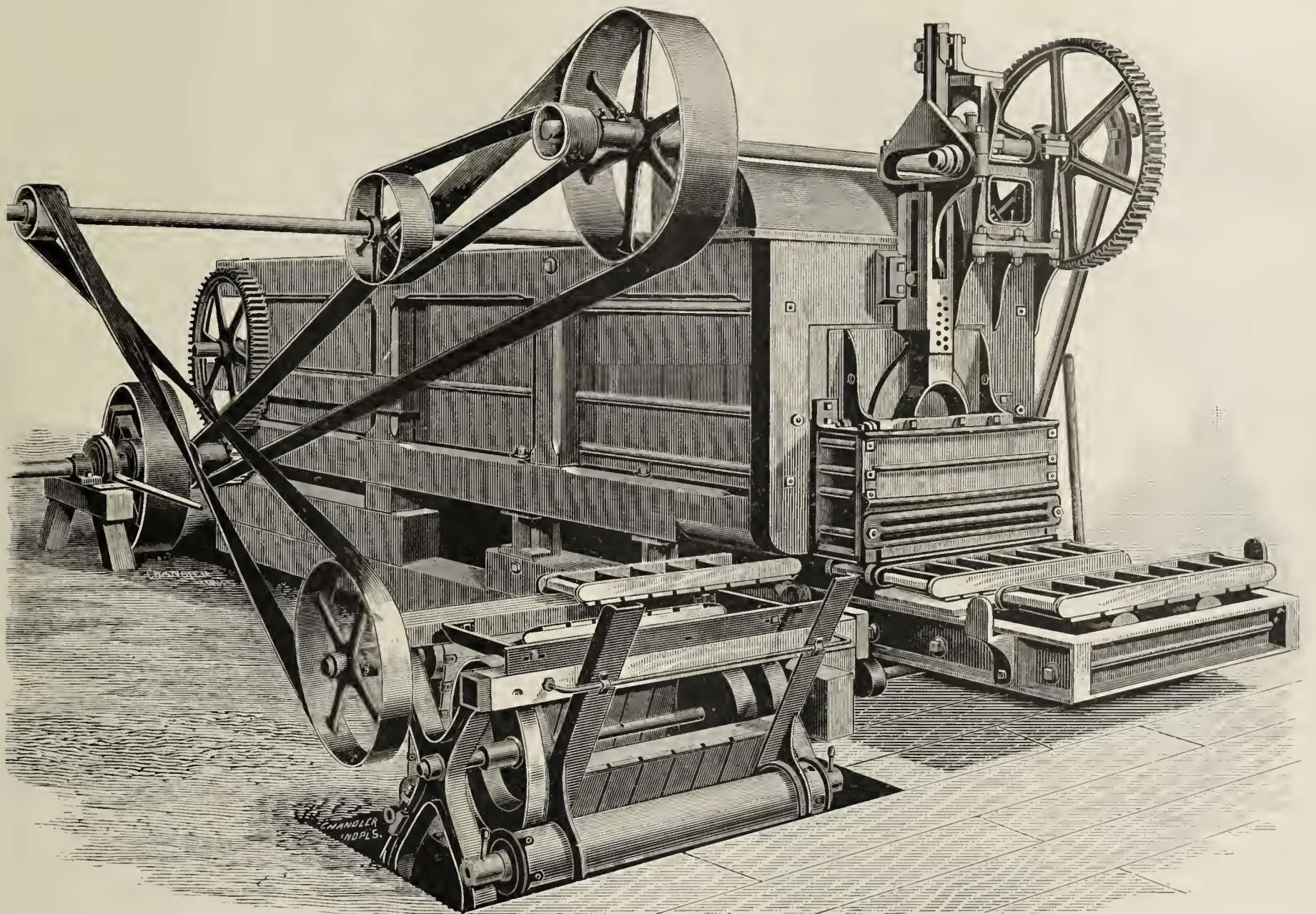
PAINESVILLE,
OHIO.



IRON STANDARD HORSE POWER.



THE AUTOMATIC FEED MOLD SANDER.



And from every State in the Union we have any number of just such letters as the above.

.. THE ..

POTTS Horizontal Stock Brick Machine

Is the LEADER.

Hundreds of them are in use and every one giving entire satisfaction. We manufacture everything needed on the Brickyard. Now is the time to purchase your supplies for the coming season.

Brick Machines, Disintegrators, Mould Sanders, Granulators, Elevators, Cars, Winding Drums, Moulds, Trucks, Barrows and all Brickyard supplies.

Our prices are low and terms liberal.

C. & A. POTTS & CO.,

816-828 West Washington St.,

INDIANAPOLIS, IND.



We're Not Photographers,

BUT WE ARE ABLE to furnish you word pictures from satisfied Clayworkers who have had years of satisfactory service from **The Eagle Repress**. They give the actual, life-like, photograph of their experience. You may write them and let them do the talking. Wherever you find an **Eagle** you find a satisfied owner.

The Eagle is the only repress giving unquestioned satisfaction.

It is the only repress never thrown out for incompetency.

Its the only repress receiving the unanimous approval of the trade.

Its the only repress not found in the second-hand lists.

Its the only repress where repair bills are the exception.

Its the only repress with a record of seven in one factory.

Its the only repress with a record of thirteen in one town.

Its the only repress with a record of constant use for years without a cent for repairs.

Its the only repress that "Never Disappoints."

Its the only repress never displaced by a competitor.

Its the only repress without a superior.

Its the only repress built for service rather than to sell at a profit.

Its the only repress where the profit is greater to the buyer than the manufacturer.

Seven **Eagles** in one factory in one year cost for repairs just 60 cents, less than ten cents each per year. Three represses of another make in the same factory during the same time cost \$185.00 for repairs. Of the total output of this factory in the year the **Eagles** each pressed as many brick as all three of the competitive machines. This is the record of only one factory. Do you want more evidence? If so, send for it.

These points and dozens of others tell why the **Eagle** is superior. There are other presses built to sell on the **Eagles** reputation but they won't compare in any respect. Imitations are dangerous—not to the builder but to the buyer. Try them if you wish but when the break comes remember that the **Eagle** is the peer of Presses and should be your selection if you want the best.

We manufacture a full line of **Dry Press, Stiff Mud, Soft Mud and other Brick Machinery and Appliances**. All our machines have records like the **Eagle Repress**. A complete catalogue for the asking.

The American Clay-Working Machinery Co.,

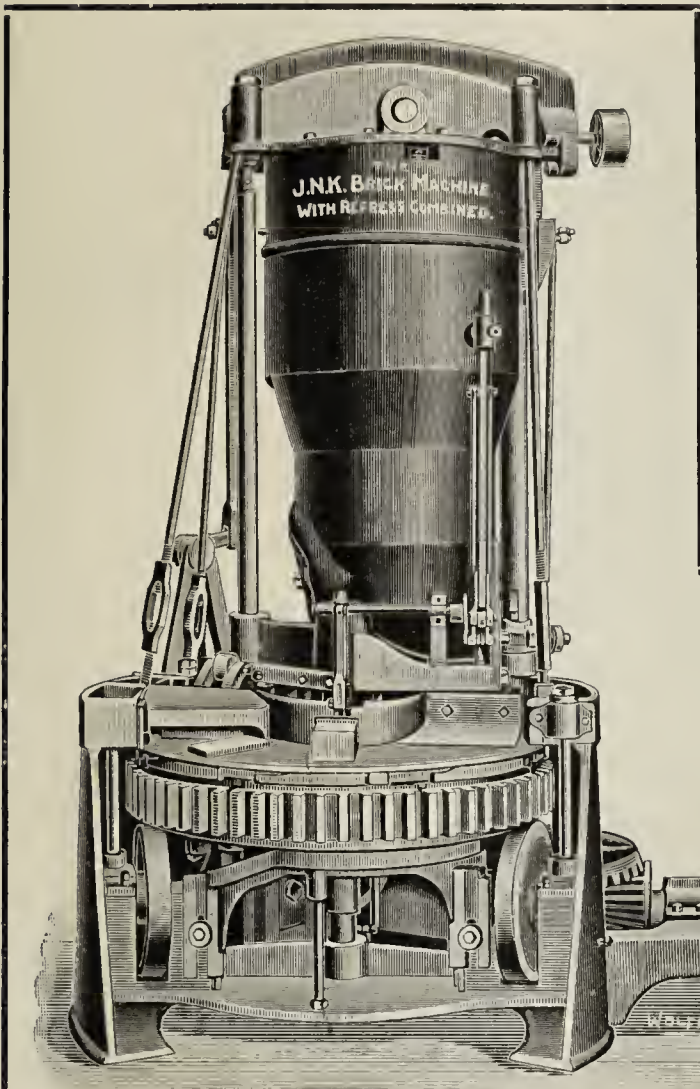
Bucyrus, Ohio, U. S. A.



A GREAT IMPROVEMENT IN STIFF MUD BRICK MACHINES.....

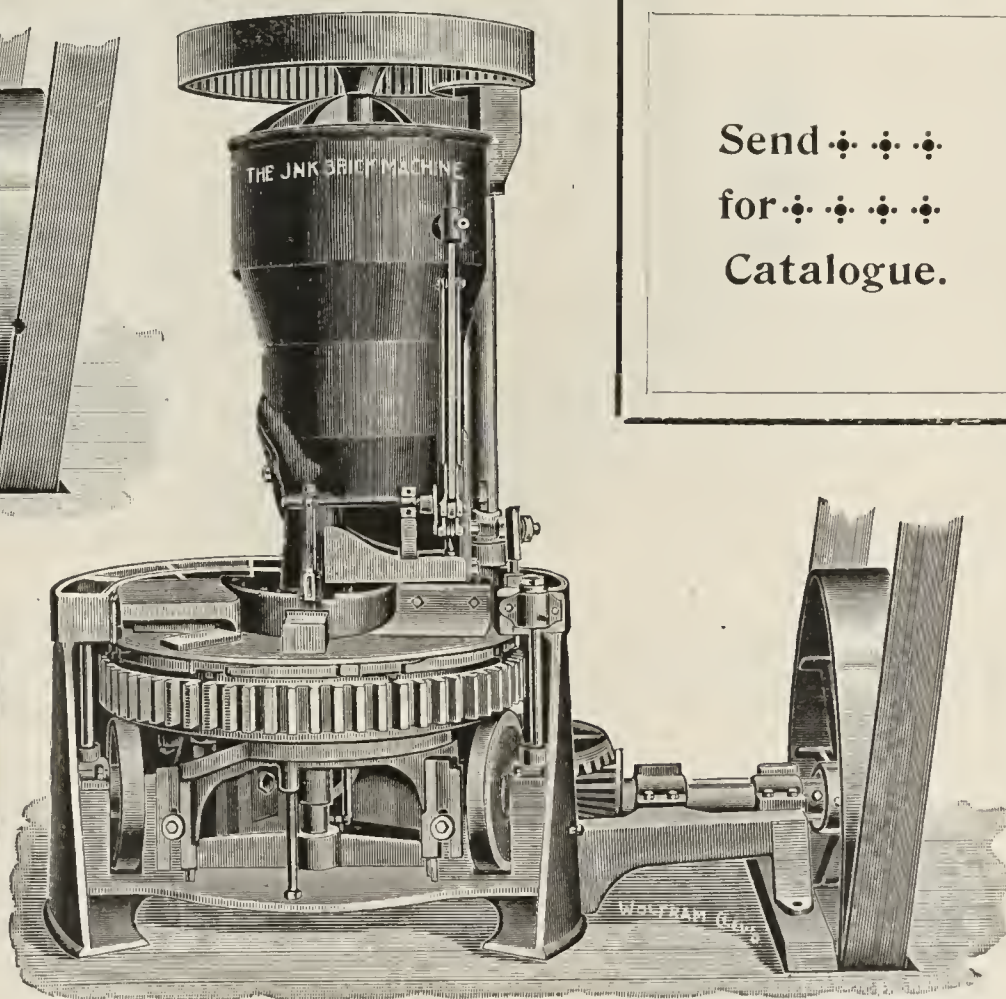
The J. N. K. Brick Machine

With Repress Combined.



The J. N. K. BRICK MACHINE with
Repress Combined.

THIS MACHINE has eight molds in the mold wheel, and the wheel revolves and brings the mold under the clay cylinder, where the molds are filled, then pressed to an even thickness, then comes the repress and represses them, next the brick is pushed out of the molds and onto a belt, then the mold is wiped and oiled and passes on under the clay cylinder again; now you have followed one mold around, and have made eight brick, now you can see as one brick is being made, one is pressed and one is repressed, one pushed out and one pushed off, and one mold wiped and oiled, and the repress is wiped and oiled every time it makes a brick, by these combined movements there is no time lost as 45 brick are made in one minute, and repressed and pushed off, and the molds wiped and oiled in the same minute, as all these movements act at the same time. With this machine fine repressed brick can be made as cheap as common brick.



The J. N. K. BRICK MACHINE without Repress.

Send ♦ ♦ ♦
for ♦ ♦ ♦ ♦
Catalogue.

The J. N. K. Brick Machine

Without the Repress will make 60 brick per minute, square, even in thickness, smooth top and bottom, sharp corners and edges, parallel in thickness, a good nice-looking brick, the mold is wiped out and oiled, and the brick are made the same as the brick on the repress machine, and the movements are the same, except the repress taken out, and it can readily be seen what I mean by a great improvement in stiff mud brick machines. As I manufactured the P. L. Sword Machine for about 10 years and having heard of all complaints, and objections to it I started out four years ago, when I bought them out, and began to remove all these though it has taken me four years of hard work and thousands of dollars to accomplish it, the results are the J. N. K. Brick Machine has none of these objections, which were made against the P. L. Sword machine; namely, the press plate and cut-off knives are not used on the J. N. K., as the brick are finished under the cylinder. The molds, when first filled, are filled one half-inch fuller than you want the brick; this surplus half-inch of clay is pressed back, under a heavy pressure into the cylinder, and the pressure is kept on till the brick is finished, so there cannot be any shifting of the clay to one side. The J. N. K. has a thorough system of wiping and oiling the molds. I will further say to those that are using the Sword Machine and are in need of a new mold wheel, or any other repairs, I respectfully request a continuance or the liberal consideration, which was at all times shown to me, by those who purchased from me. Any one wishing further information on the J. N. K. Brick Machine or desiring a P. L. Sword Machine or any part thereof, address

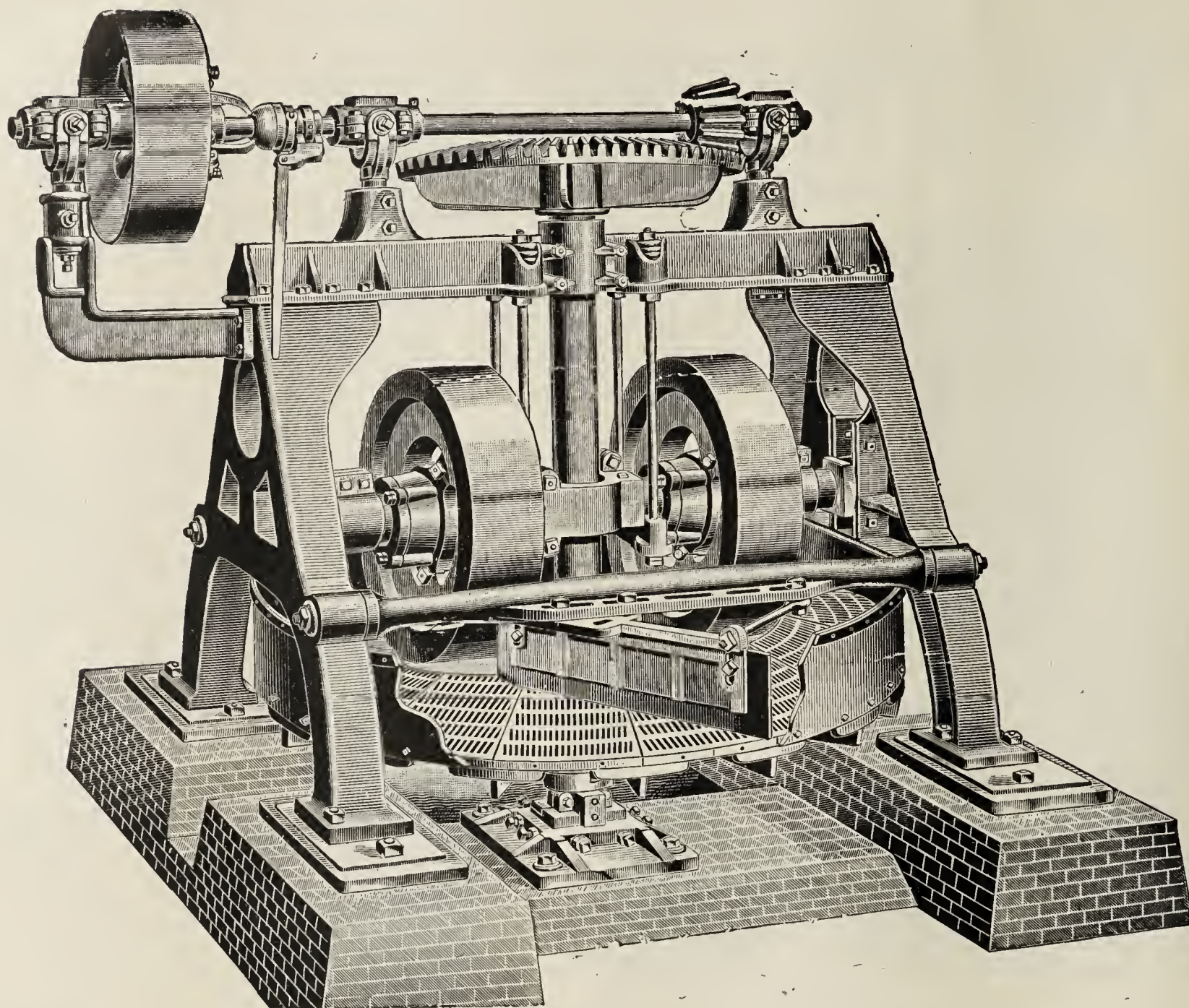
Central Machine Works,

JOHN N. KAUFHOLZ, Proprietor,

OFFICE AND WORKS:
226-236 Abbey Street.

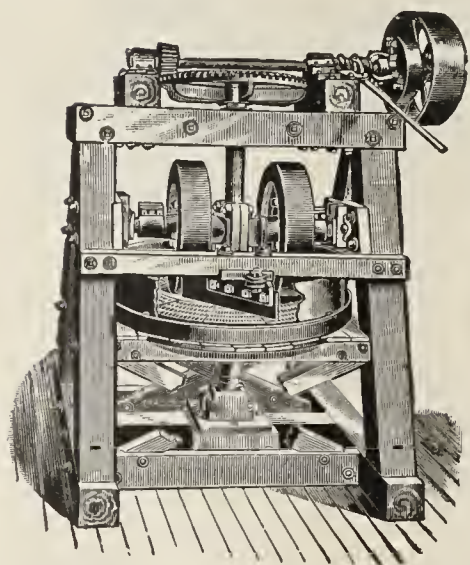
~~~~~CLEVELAND, OHIO.





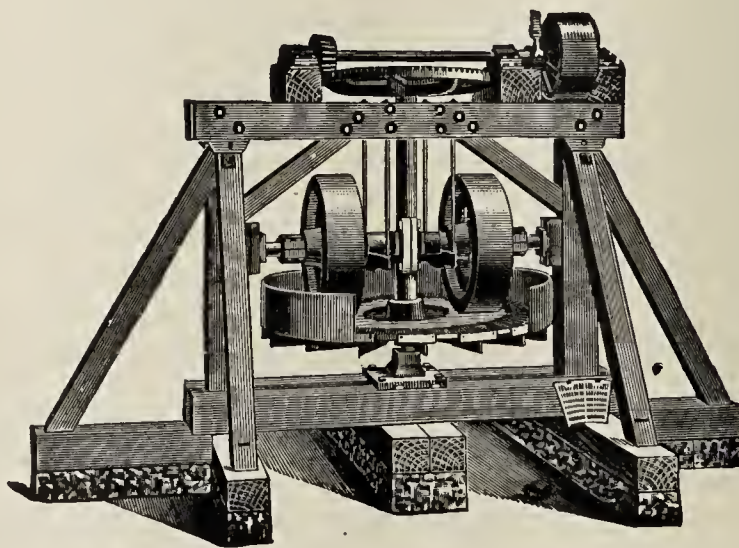
OUR SPECIALTY IS

**DRY PANS.**



IRON FRAMES,  
WOOD FRAMES.

~~~~~  
All Sizes and Price
to suit
Any Size Plant.
~~~~~



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

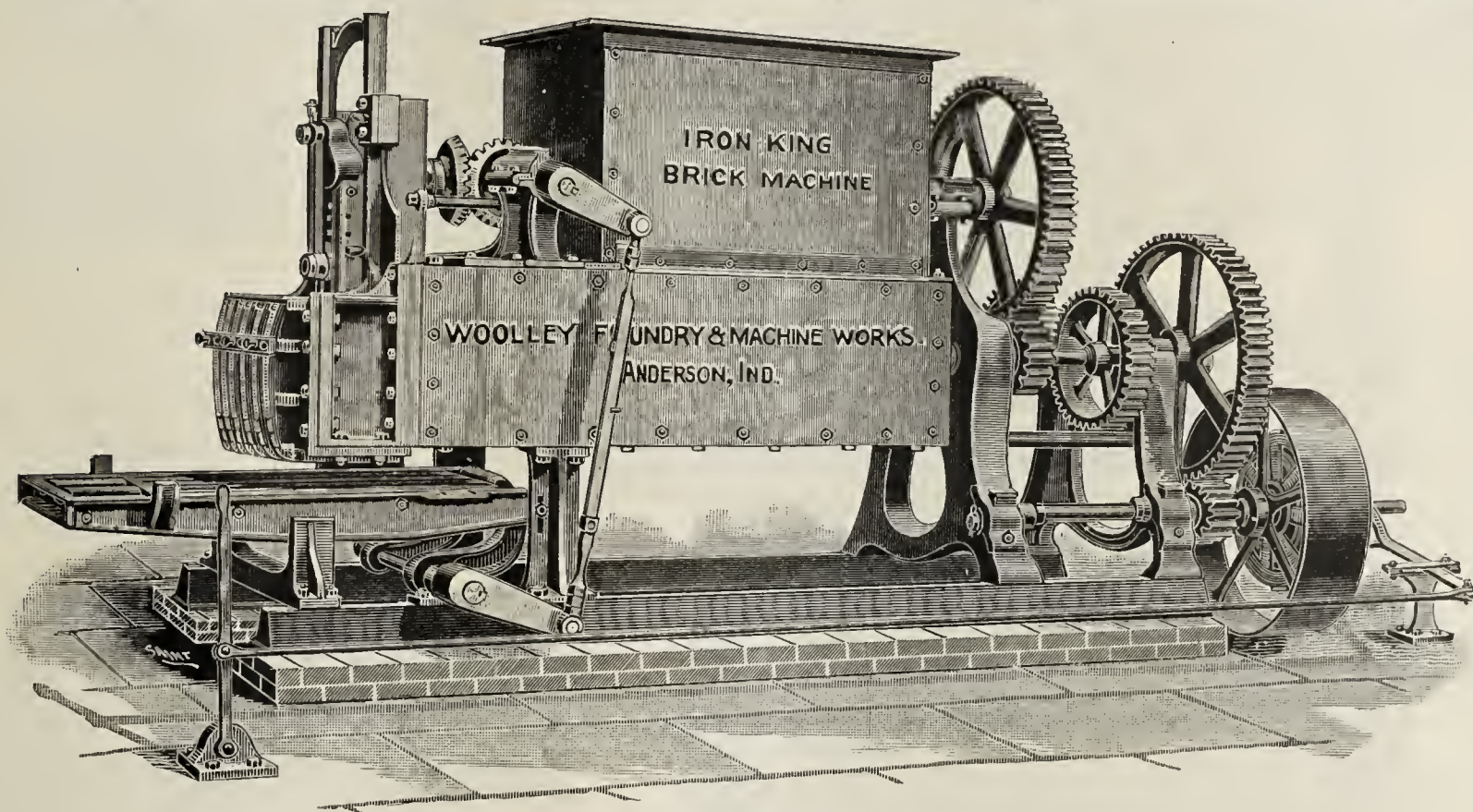
**FROST ENGINE CO.,** Galesburg, Ill.,  
U. S. A.



# SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “**IRON KING**” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

**WOOLLEY** DRY PANS,  
PUG MILLS,  
SLIP PUMPS  
and PRESSES

Are all made for hard service If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US  
PLEASURE TO QUOTE  
YOU PRICES. . . .

Mention the Clay-Worker.

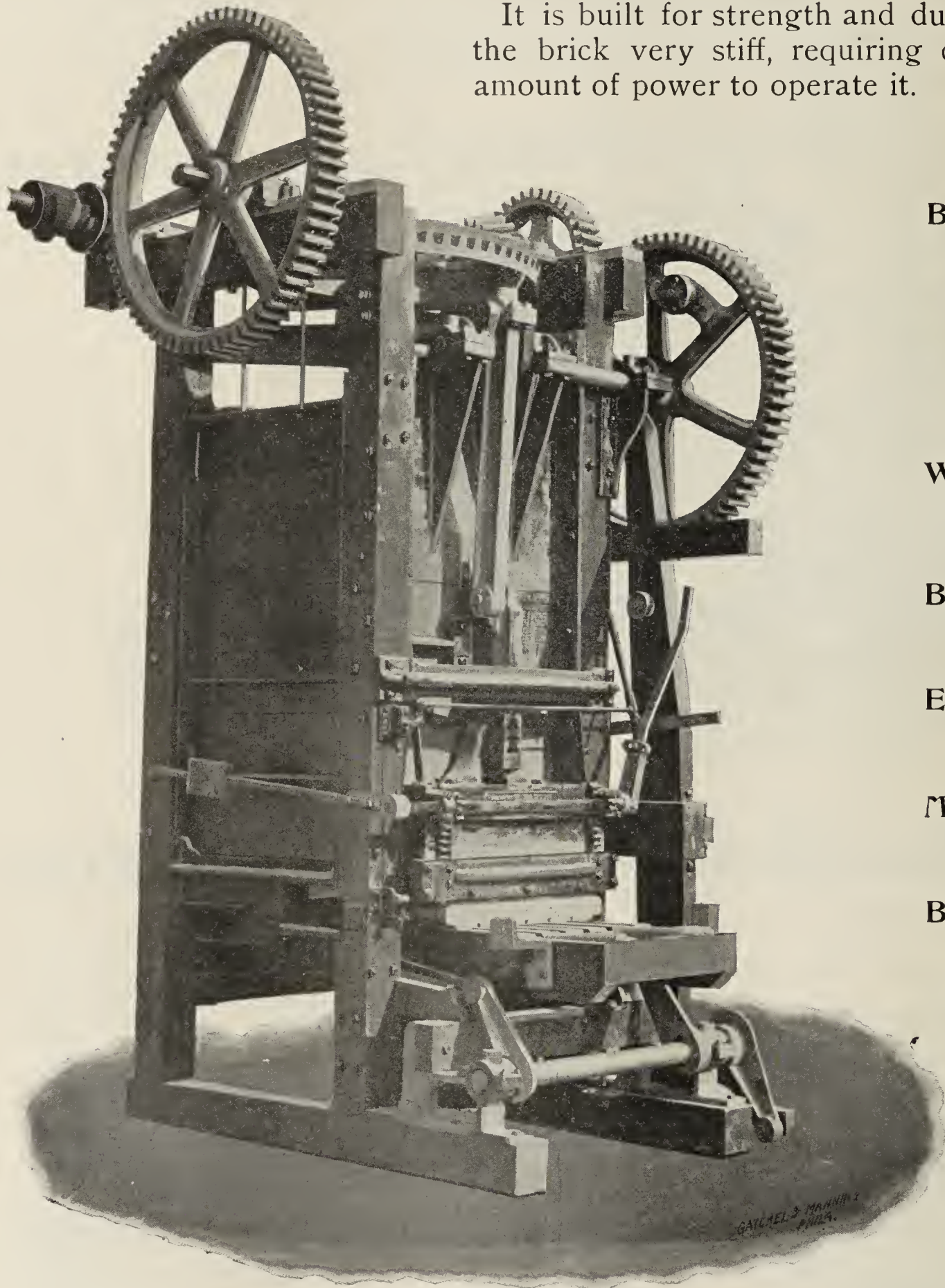




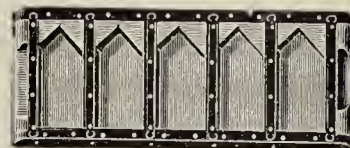
# The Favorite Stock Brick Machine.

Weight 10,500 Pounds.

It is built for strength and durability, and to mould the brick very stiff, requiring comparatively a small amount of power to operate it.



• • •  
**BRICK MOULDS**



....a Specialty.

• • •  
We furnish everything  
a Brickmaker needs.

• • •  
Brick Machines,  
Pug Mills,  
Clay Crushers,  
Elevators,  
Sand Grinders,  
Mould Sanders, etc.  
Machine Moulds,  
Hands Moulds,  
Wheel Barrows,  
Brick Trucks,  
Sand Dryers,  
Dump Cars,  
Dryer Cars,  
Kiln Castings, etc.



ALL SIZES. ALL SHAPES.

Send for our 1898 Catalogue and mention anything you need.

## The Henry Martin Brick Machine Mfg. Co.,

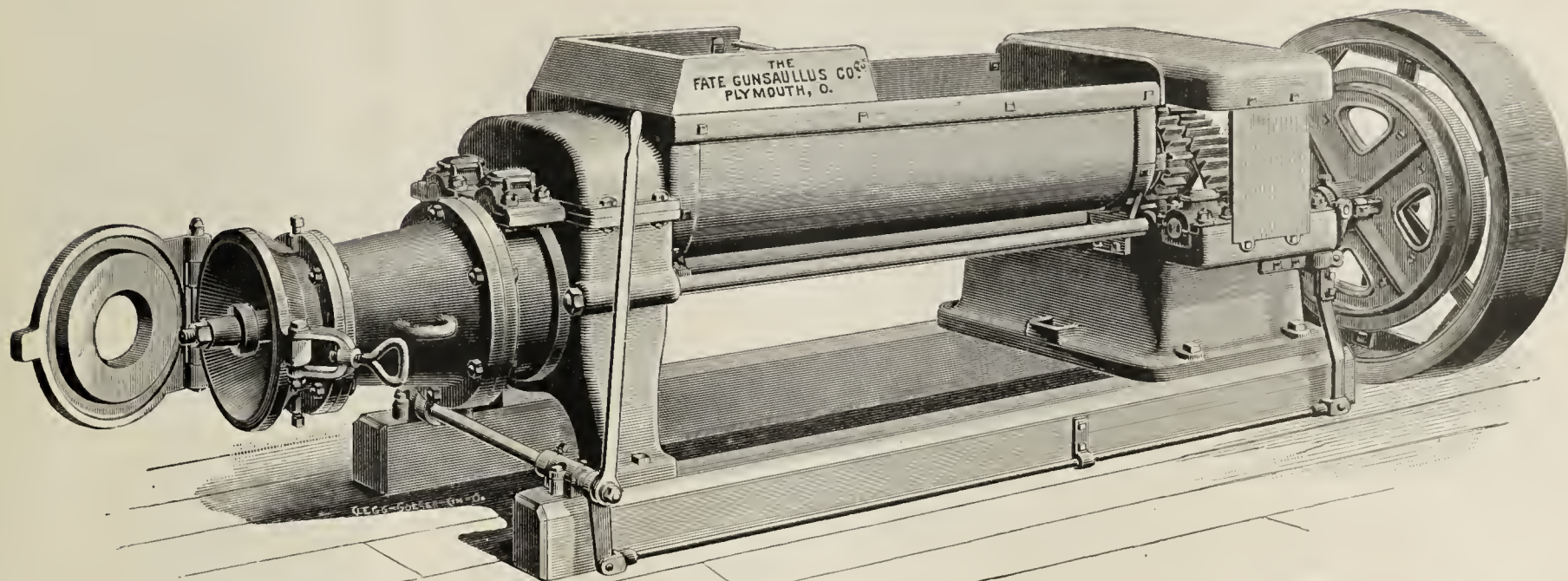
OFFICE AND WORKS: 552 No. Charlotte St.

LANCASTER, PENN.

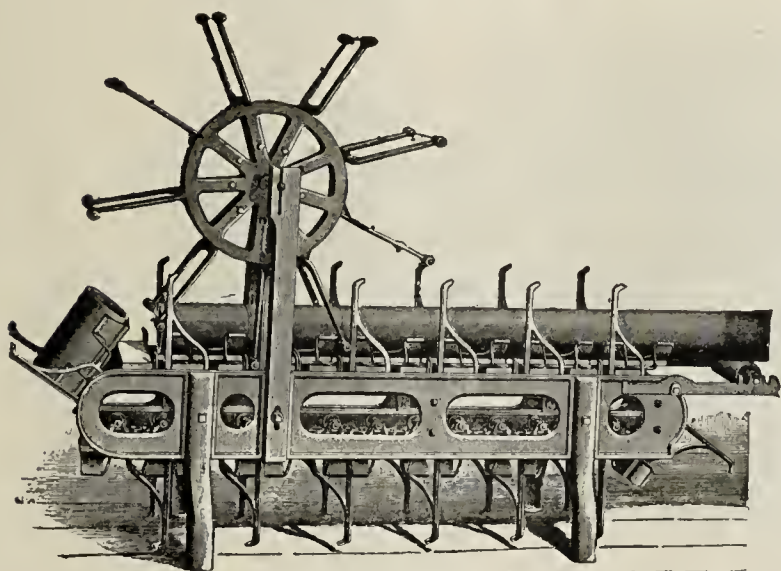
Postal Telegraph-Cable Co. Direct wires to Factory Office.



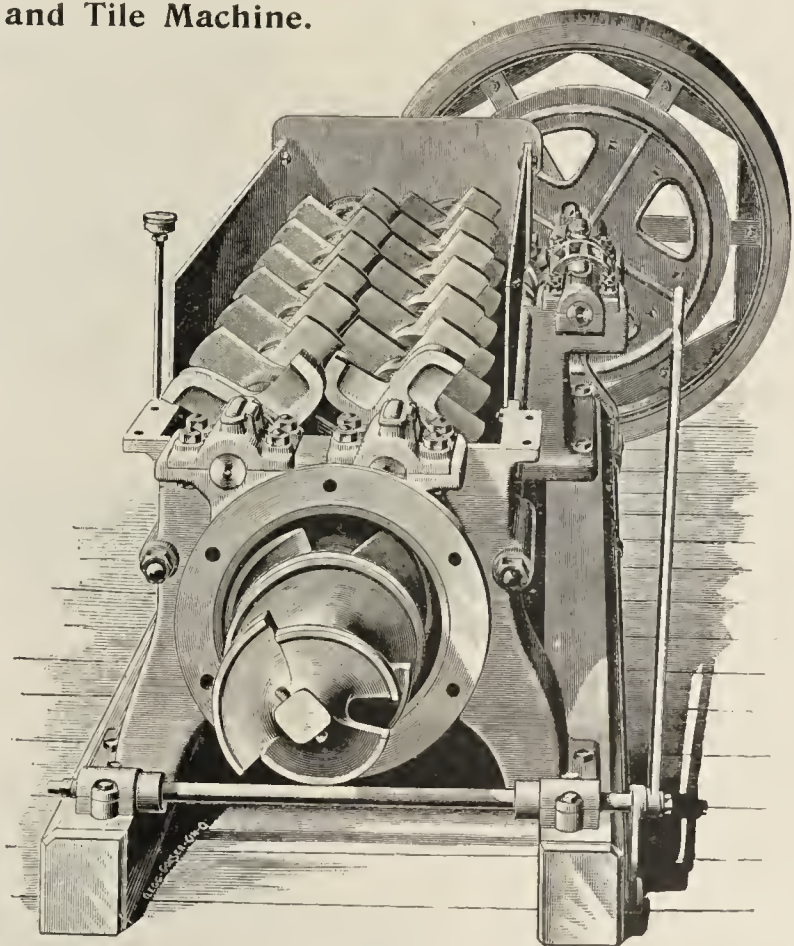
# The "PLYMOUTH."



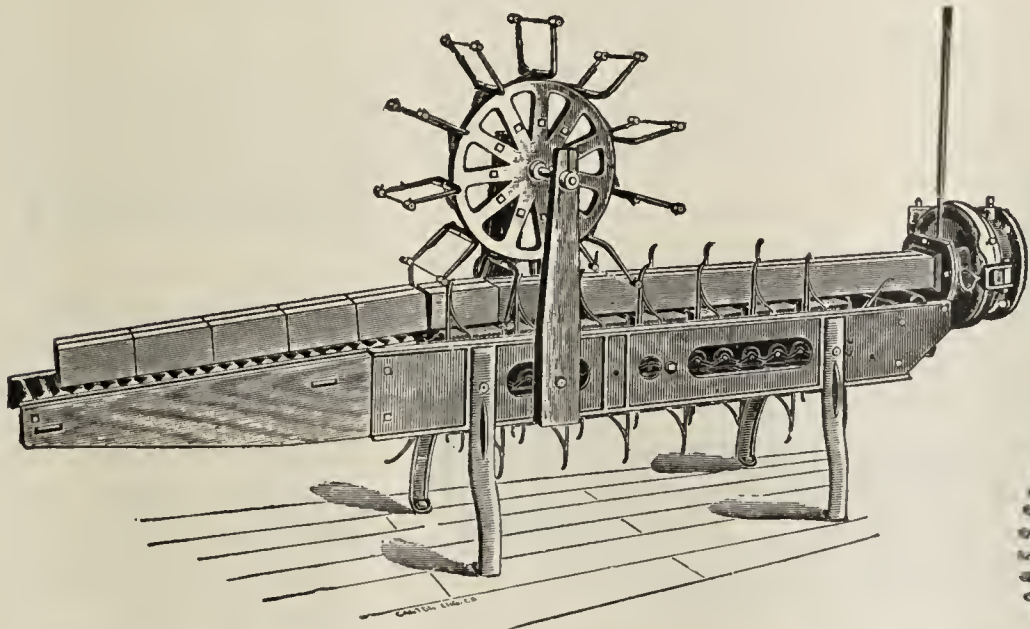
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



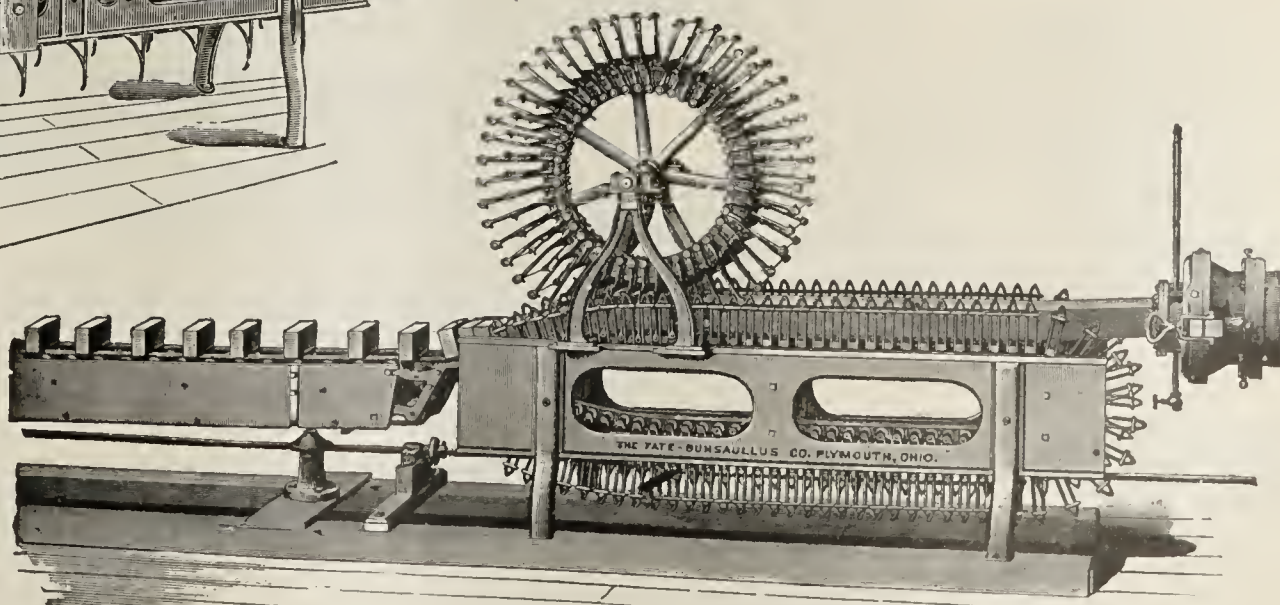
Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



"HUMMER" (Interior View.)



Automatic End-Cut Brick Table.



Automatic Side-Cut Brick Table.

Write for particulars to

**J. D. Fate & Co.,**

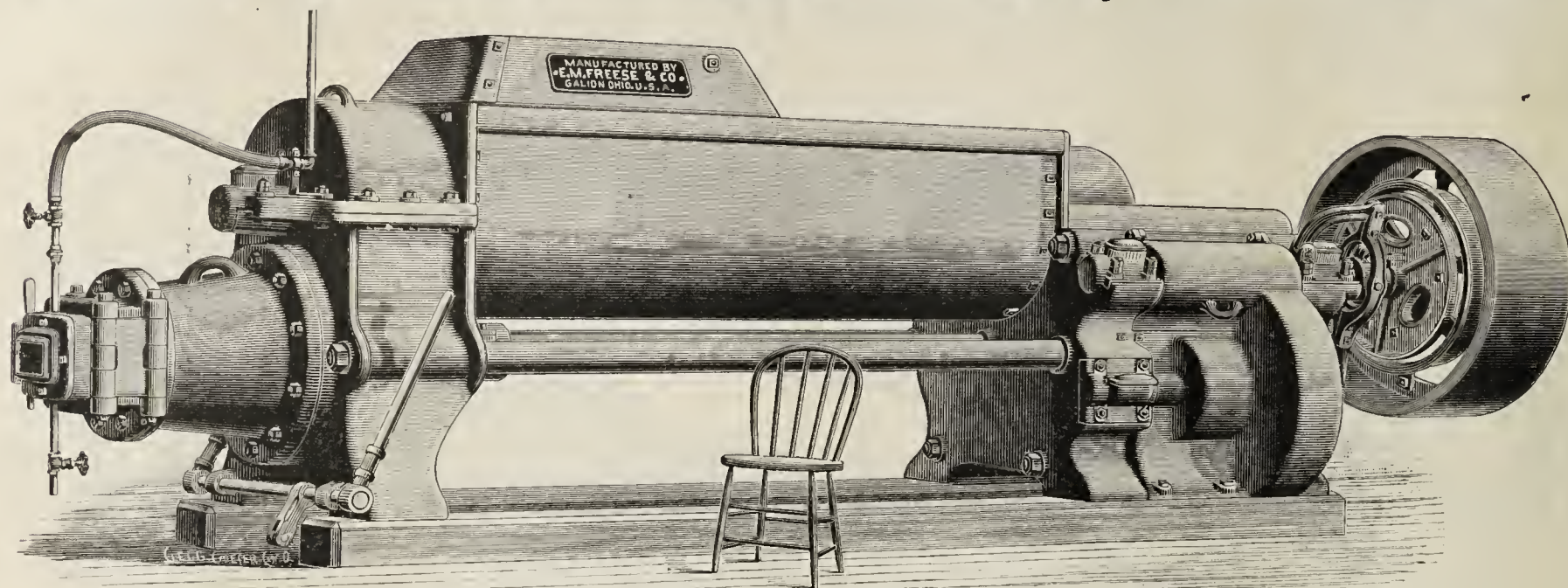
PLYMOUTH,  
Richland County, OHIO.

**B. E. LaDow,**

Special Western Representative,  
406 Chamber of Commerce Bldg., CHICAGO, ILL.

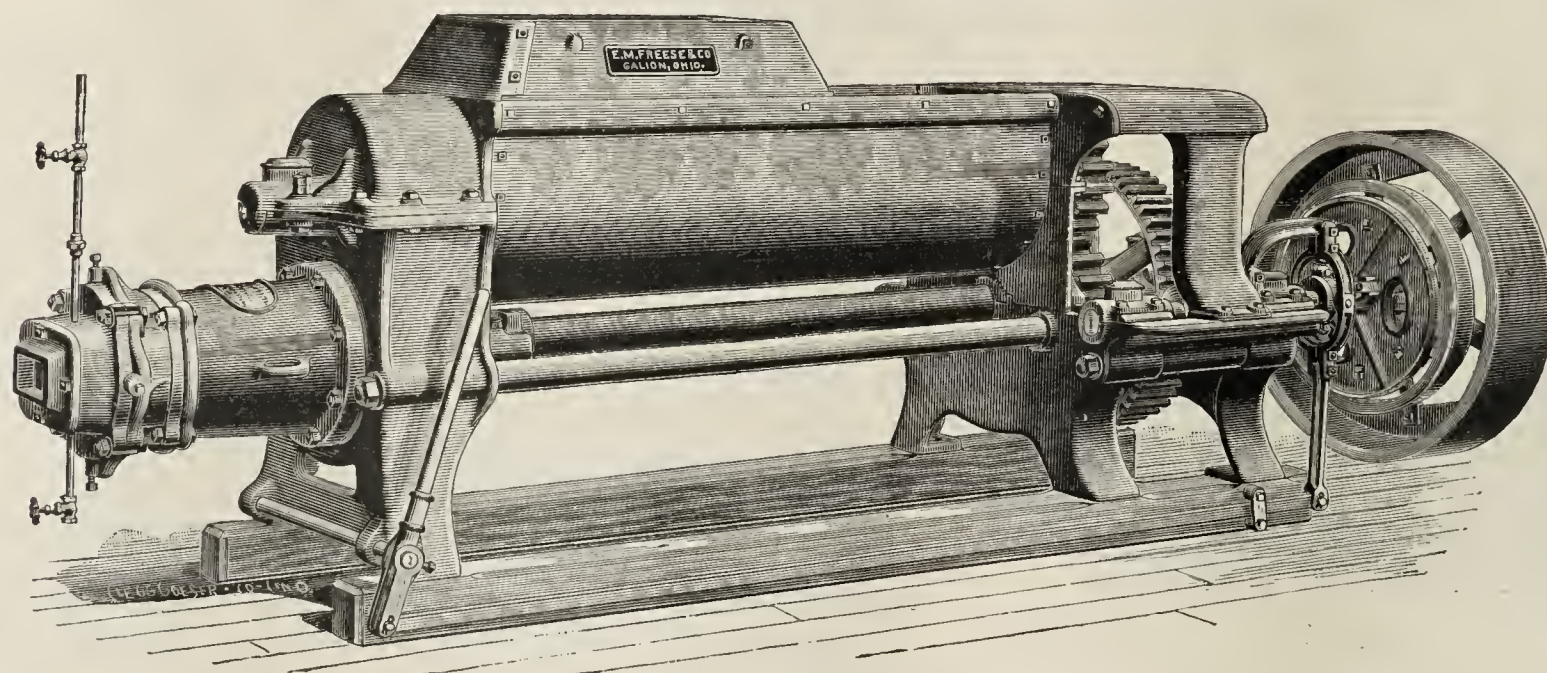


# The Original Union Brick Machines



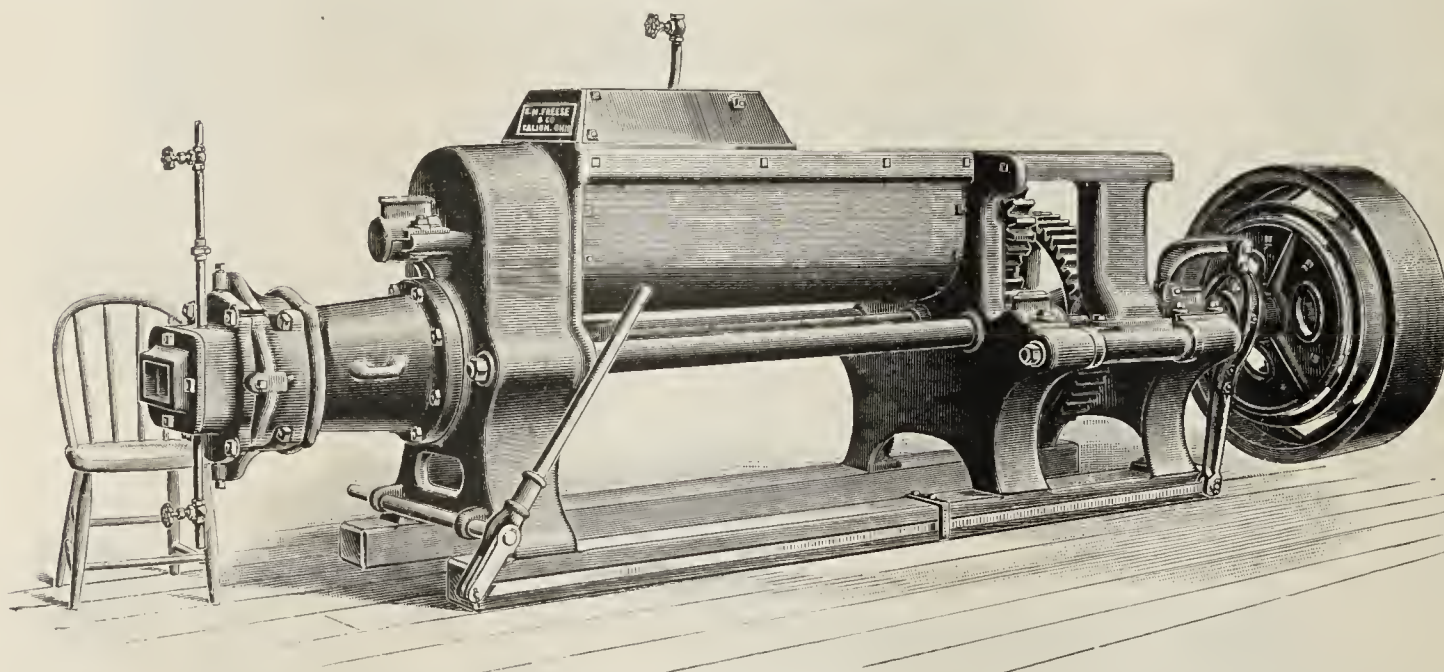
## SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



## No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



## No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

**E. M. FREESE & CO., Galion, Ohio.**

These Machines are  
NOT an experiment.

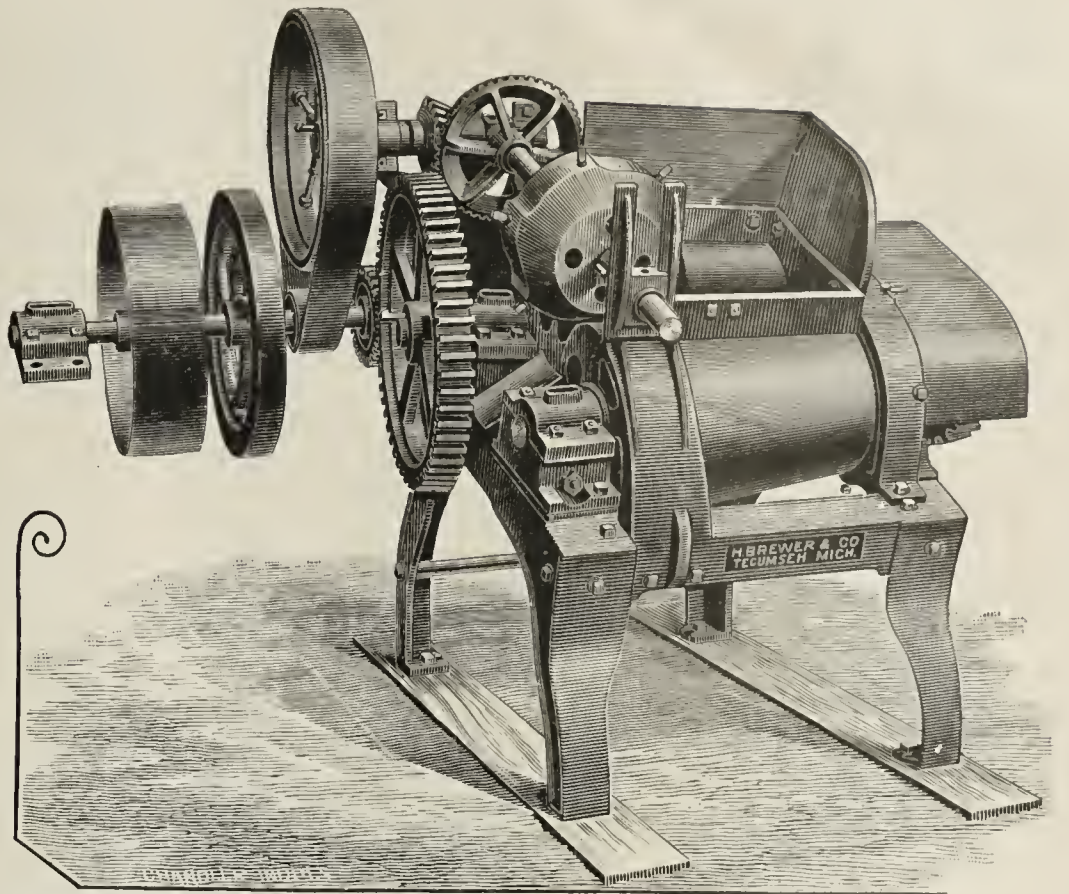
They are used in fif-  
teen States.

They are a SUCCESS  
Investigate them.

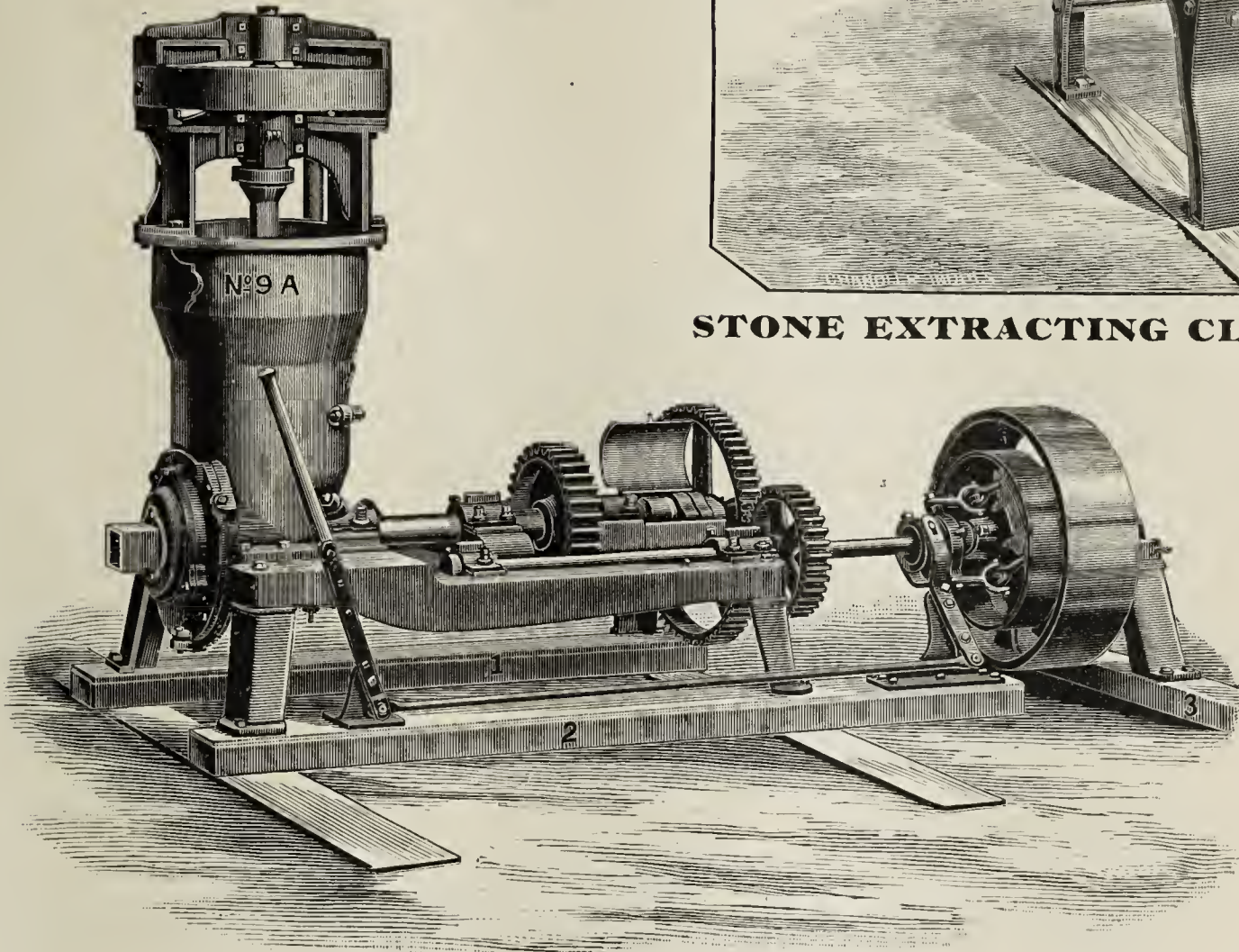
No separate Pug Mill  
required.



# Clay . . . . Working Machinery



**STONE EXTRACTING CLAY CRUSHER.**



**No. 9 "A" BRICK MACHINE.**

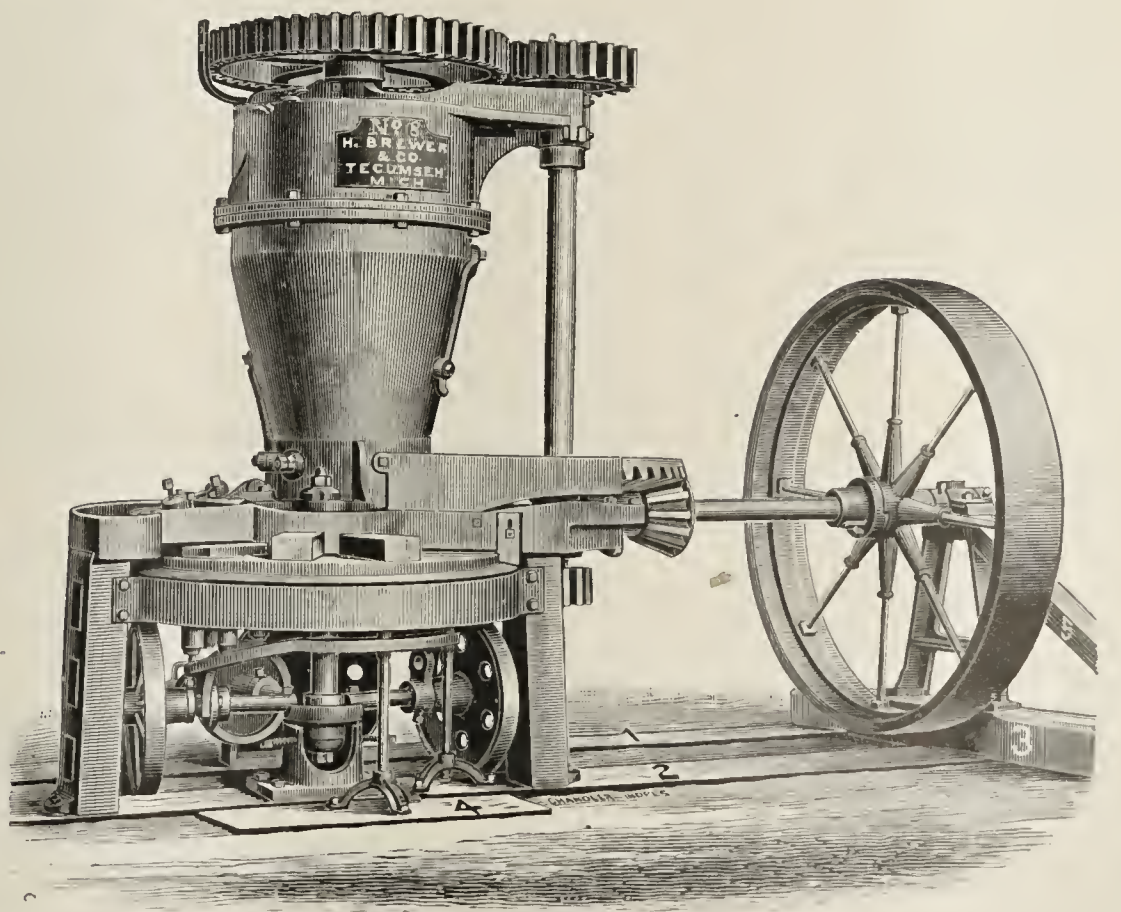
Complete  
Brick  
and  
Tile  
Outfits  
a Specialty.



*Manufactured by*

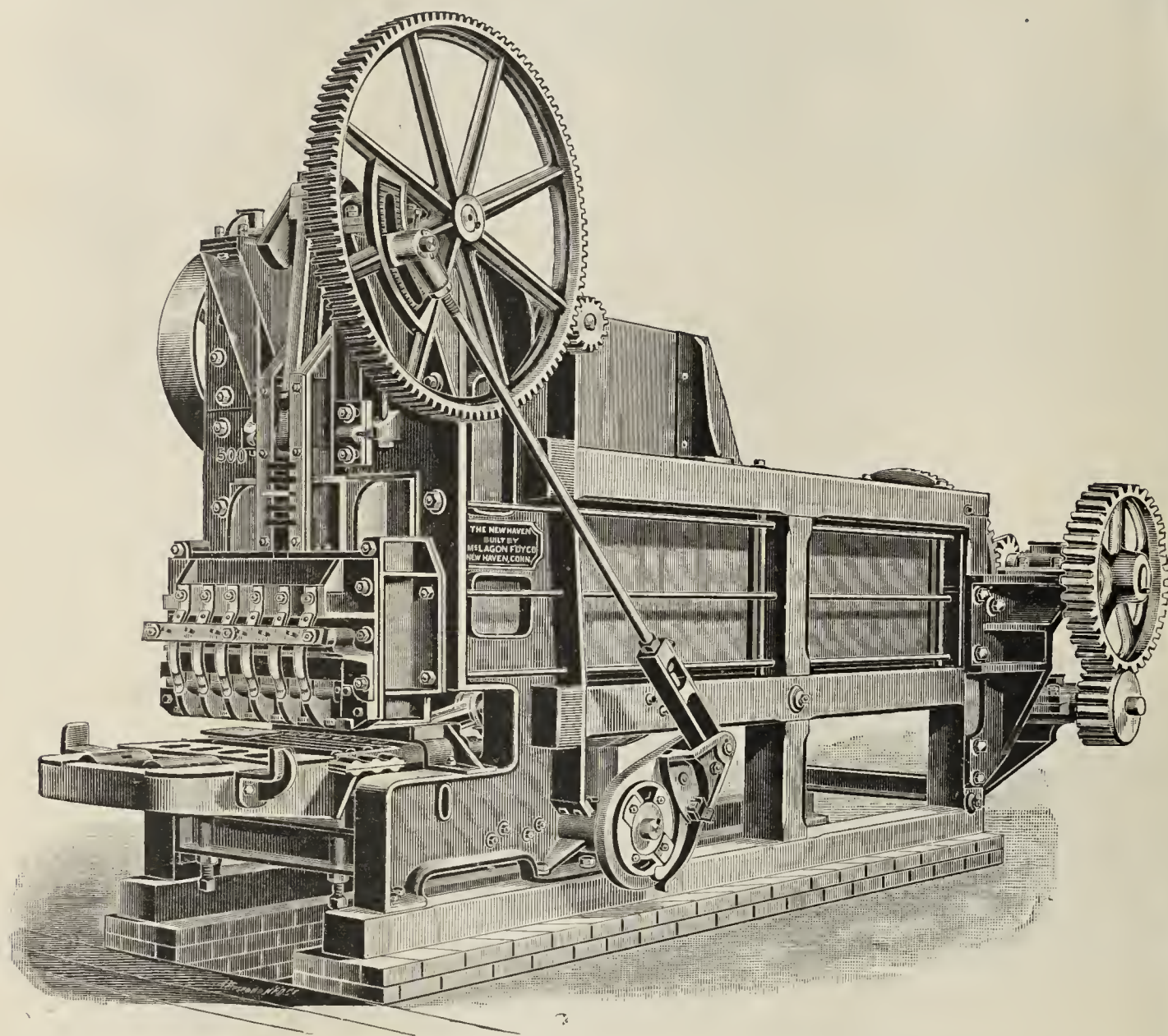
**H. Brewer  
& Co.,**

**TECUMSEH,  
. . . . MICH.**





# SIXTH SEASON.



No Expense  
Whatever  
for Repairs.



No Loss  
of Time.



Made Better  
Brick Than  
Before.

SAG HARBOR, N. Y., Nov. 10, 1897.

THE EASTERN MACHINERY CO., New Haven, Conn.:

Gentlemen:—We ran the "New Haven" Brick Machine the past season without any expense whatever for repairs, and without loss of any time, and made better brick than we ever made before; this being the Sixth Season we have used it.

Truly yours,

SAG HARBOR BRICK CO.

C. W. PAYNE, Treasurer.

We think this a Good Record.

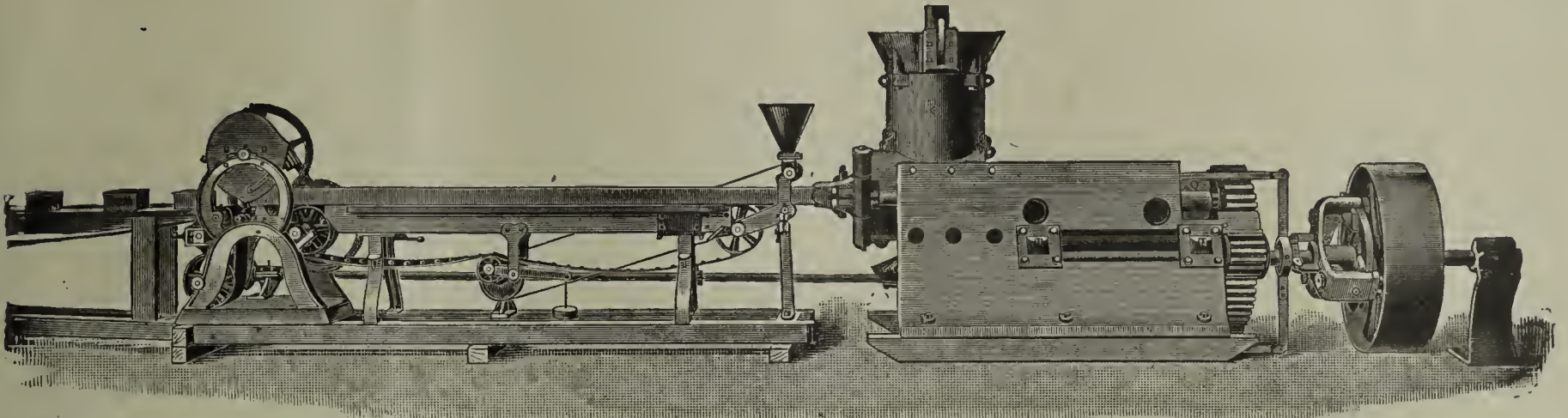
Write for "Reports from Reliable People."

## The Eastern Machinery Co.,

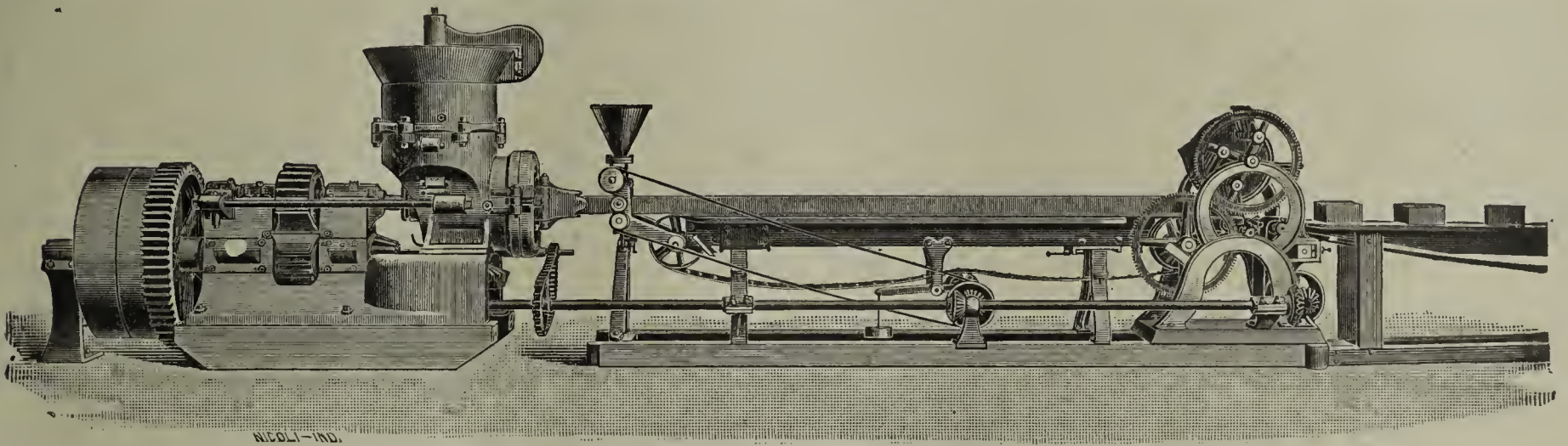
NEW HAVEN, CONN.



# WONDER MACHINERY.



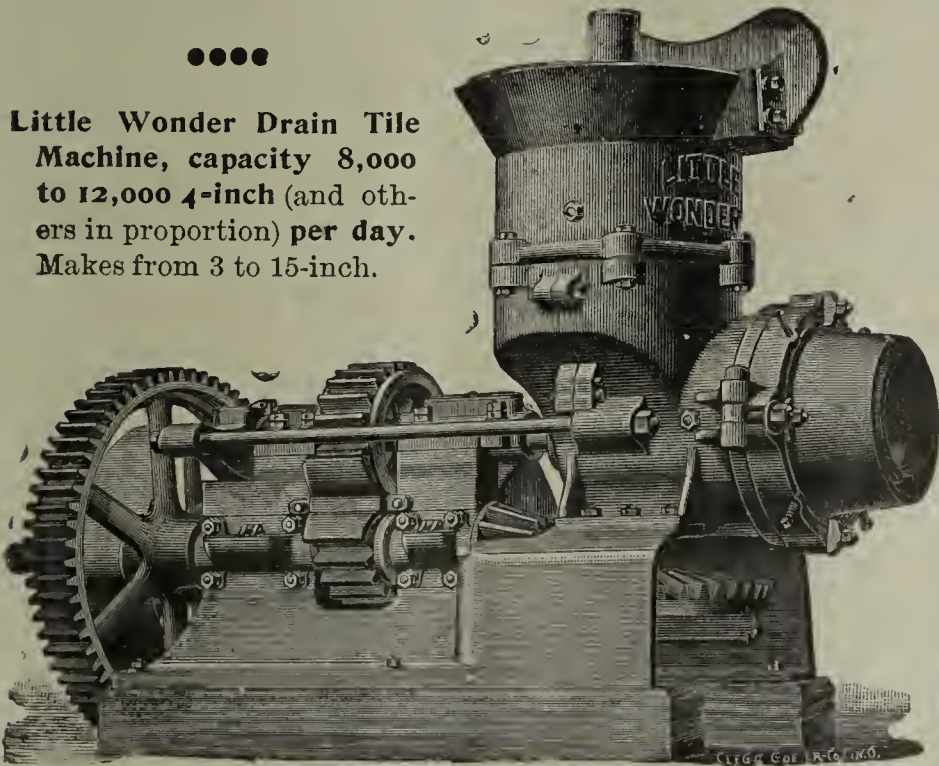
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



MANUFACTURED BY ~

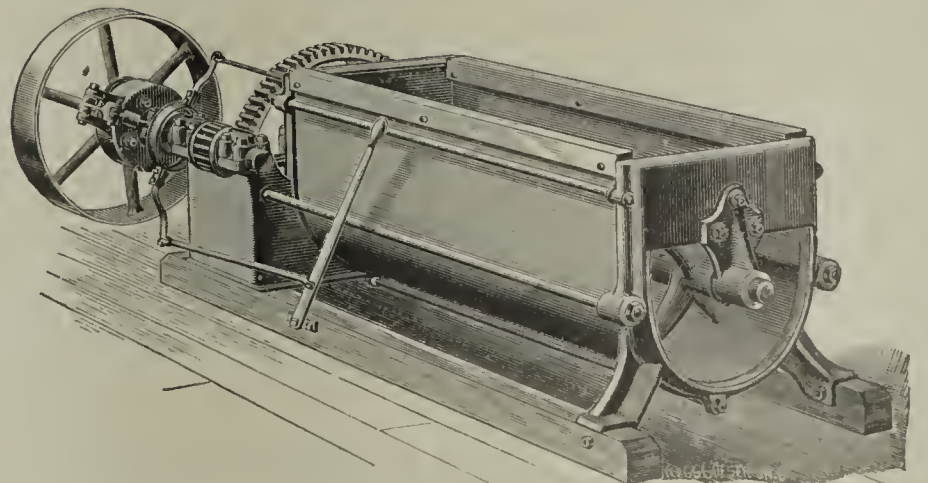
The Wallace Mfg. Co.,  
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

Catalogue Free.

THE WONDER BRICK MACHINES have a Great Puging Capacity, therefore, less lamination in the brick. Guaranteed to run with less power and require less repairs, hence, they are "MONEY SAVERS" and MONEY MAKERS."



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity



# Iron Clad Dryer.....IN THE LEAD

**All Dry Houses** Built in 1898  
will be equipped with Important new inventions for reducing cost of drying.

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Steam  
Heat,  
Natural  
Draft.



**Guaranteed** To dry soft mud, stiff mud, dry pressed brick and tile, free from white-wash, disintegration or other injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

## WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,  
Harrison 296.

CHICAGO, ILL.



## DETROIT, MICH.

The  
Best Brick  
Dryer  
on Earth

NOTE -

- WE DRY ENOUGH BRICKS ANNUALLY -
- TO BUILD A WALL TEN COURSES -
- HIGH FROM SAN FRANCISCO TO -
- NEW YORK -





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX, No. 5.

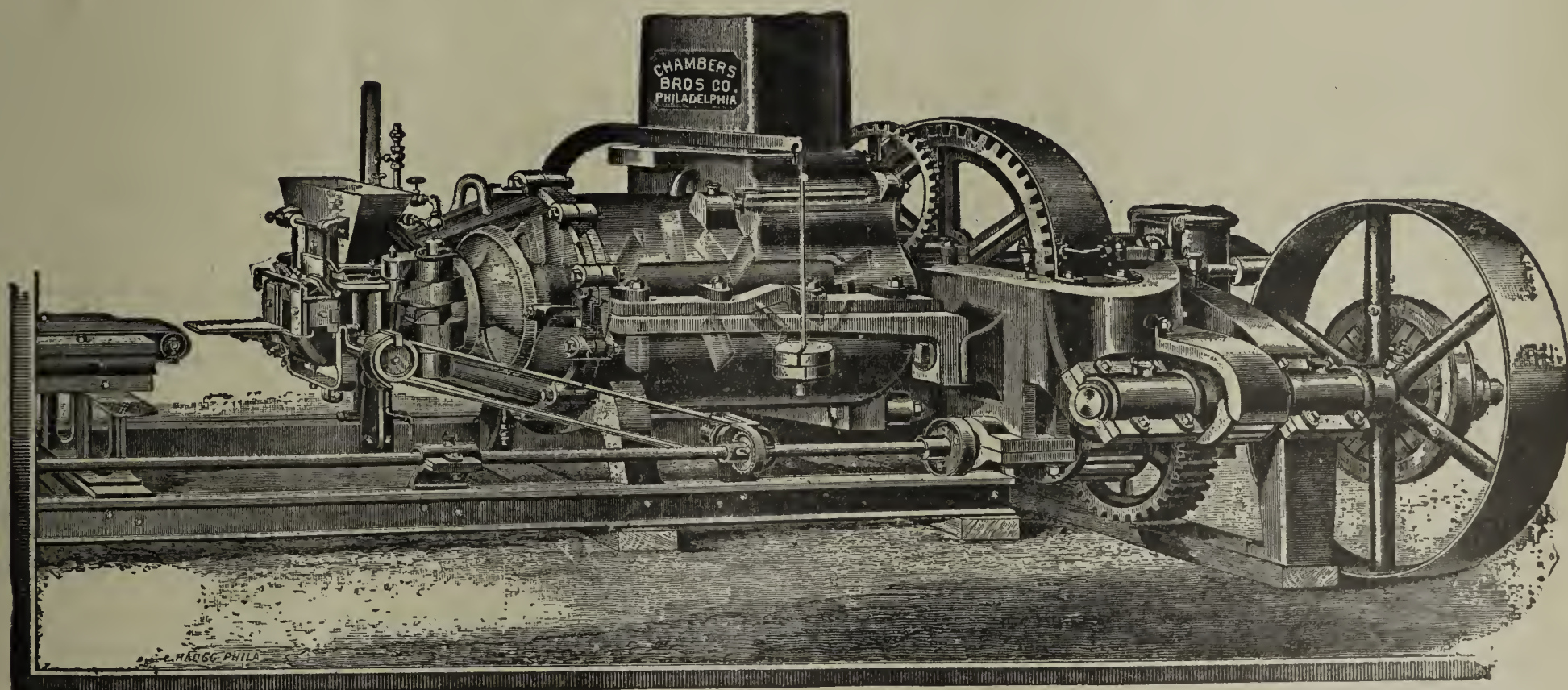
INDIANAPOLIS, IND., MAY, 1898.

\$2.00 a Year in Advance.

# Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



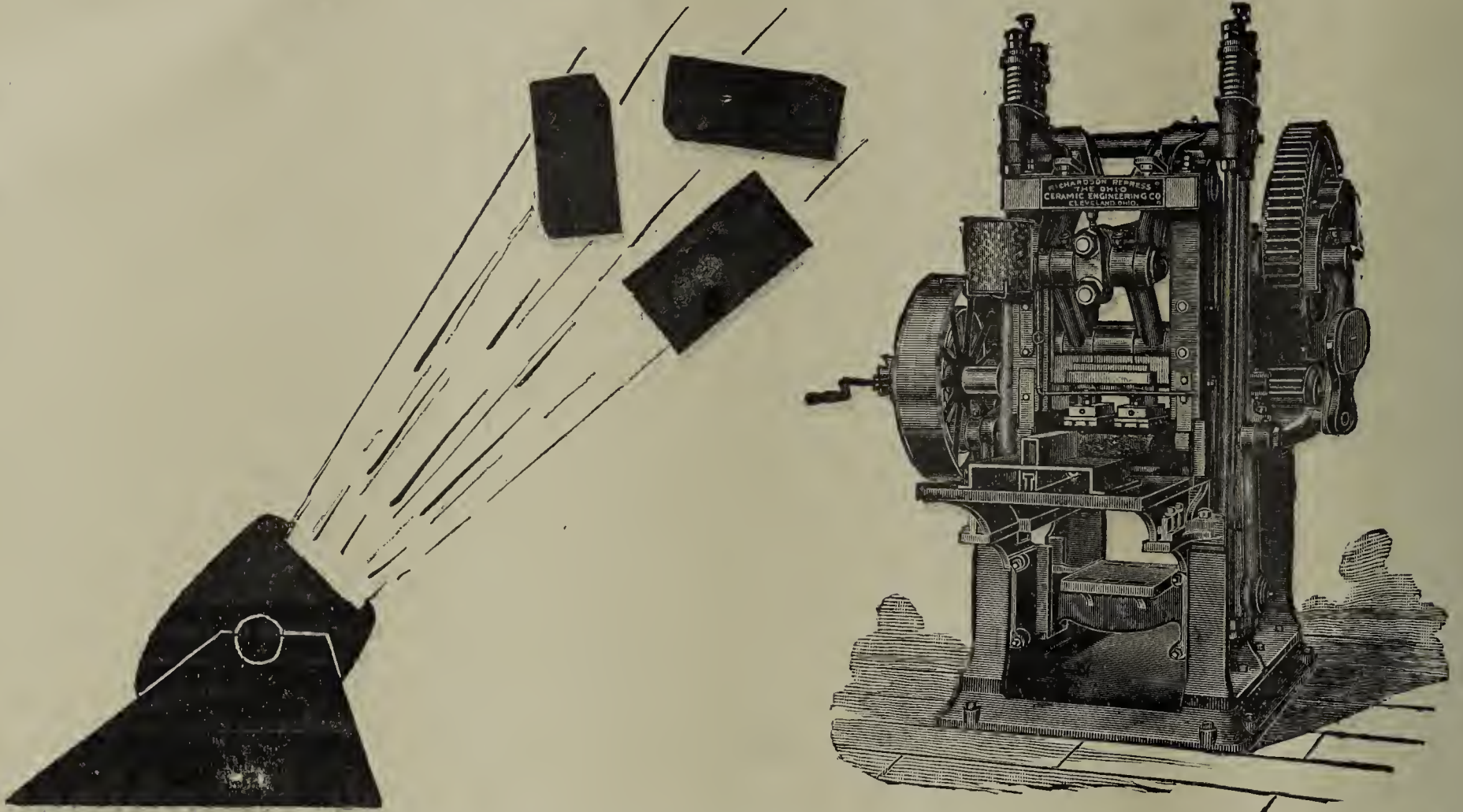
## Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,  
171 South Canal Street.

PHILADELPHIA, PA.





**IF BRICK** Could be used as projectiles the RICHARDSON REPRESS would keep the Government supplied. Write for Catalogue describing our Clayworking Machinery. . . .

**The Ohio Ceramic Engineering Co., Cleveland, Ohio.**

# The Potts Mould Sander.

Simple in Construction, Strong and Durable. Never breaks or Causes Delays.

• • •

## THE BROCKWAY BRICK COMPANY,

Manufacturers of Superior Quality Building Brick.

Fishkill-on-Hudson, N. Y., October 23, 1897.

Messrs. C. & A. Potts & Co., Indianapolis, Ind.

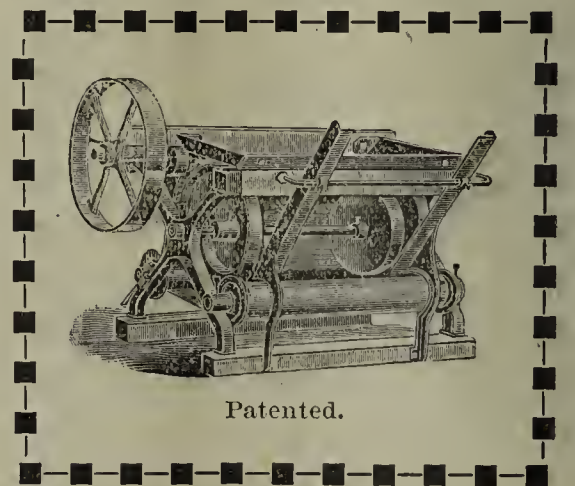
Dear Sirs—We have used four of your Mould Sanding Machines the past season, and they have given us entire satisfaction, neither one of the four having lost any time from breakdowns, or delays of any kind.

Yours respectfully,  
BROCKWAY BRICK COMPANY.

• • •

This is a great money maker. A boy does the work better than can be done by hand; no sand wasted; is easily adjusted to suit any size mould.

We also make a specialty of Brick Moulds for machine or hand, made of all cherry, bound with extra heavy steel. You will find our prices right.



**C. & A. POTTS & CO., 814 to 824 W. Wash. St., INDIANAPOLIS, IND.**



**THE HARRINGTON & KING PERFORATING CO.**  
CHICAGO, ILL.

**THE H. & K. P. CO.**  
PERFORATED SHEET STEEL  
FOR  
**CLAY SCREENS**

SEWER PIPE  
BRICK.  
FOR CHUTE  
SCREENS.  
TERRA-COTTA  
FOR REVOLVING  
SCREENS.  
DRY PAN  
SCREENS.

Eastern Office: No. 284 Pearl Street,  
NEW YORK.

General Office and Works: No. 231 North Union St.  
CHICAGO, ILL., U. S. A.

# The MONARCH

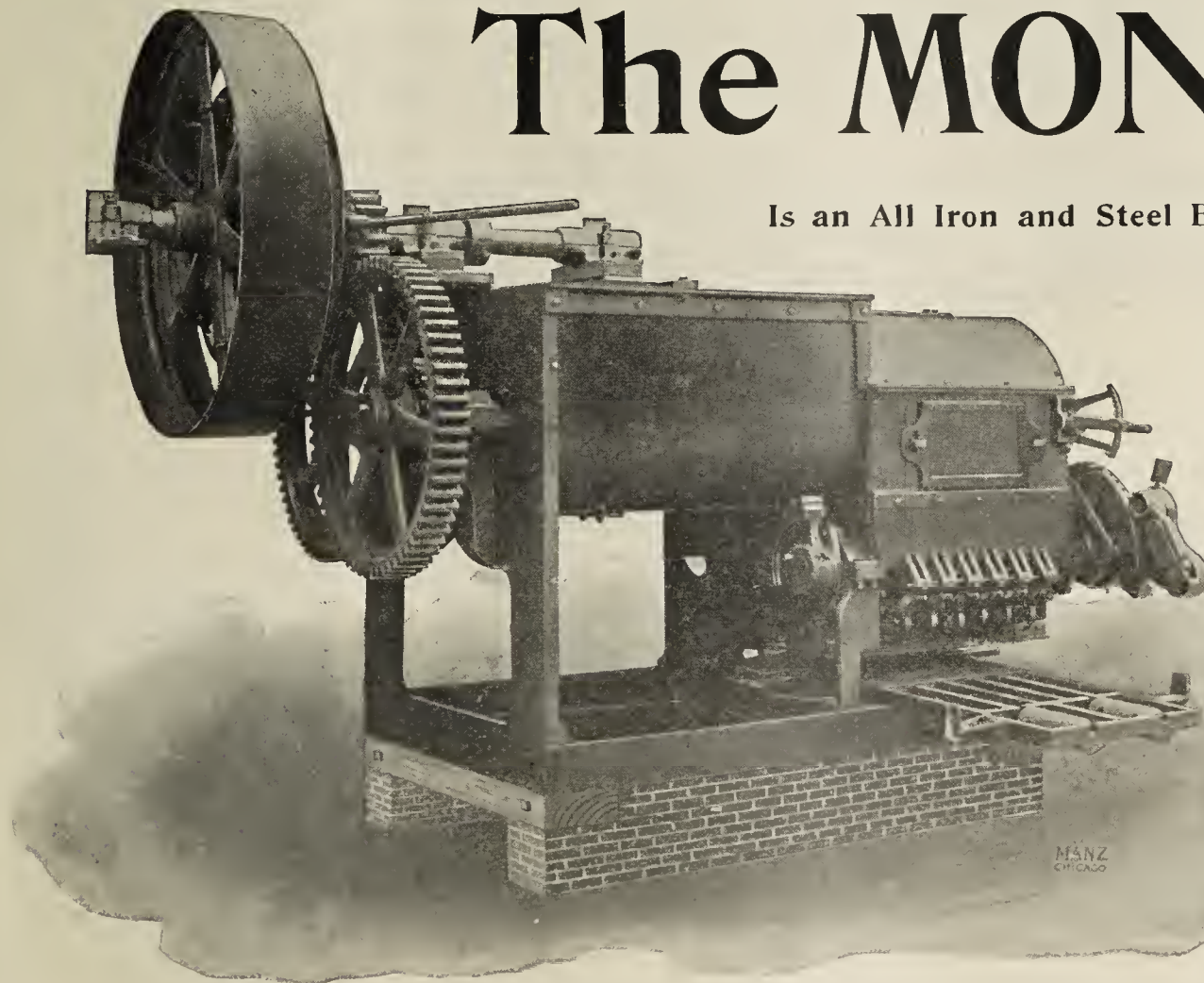
Is an All Iron and Steel Brick Machine with

Double  
Pug Mill.

...

SIMPLE  
IN CON-  
STRUCTION,  
DURABLE  
AND . . .  
POWERFUL.

...



Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER**. Engines and boilers. Send for 1898 Catalogue.

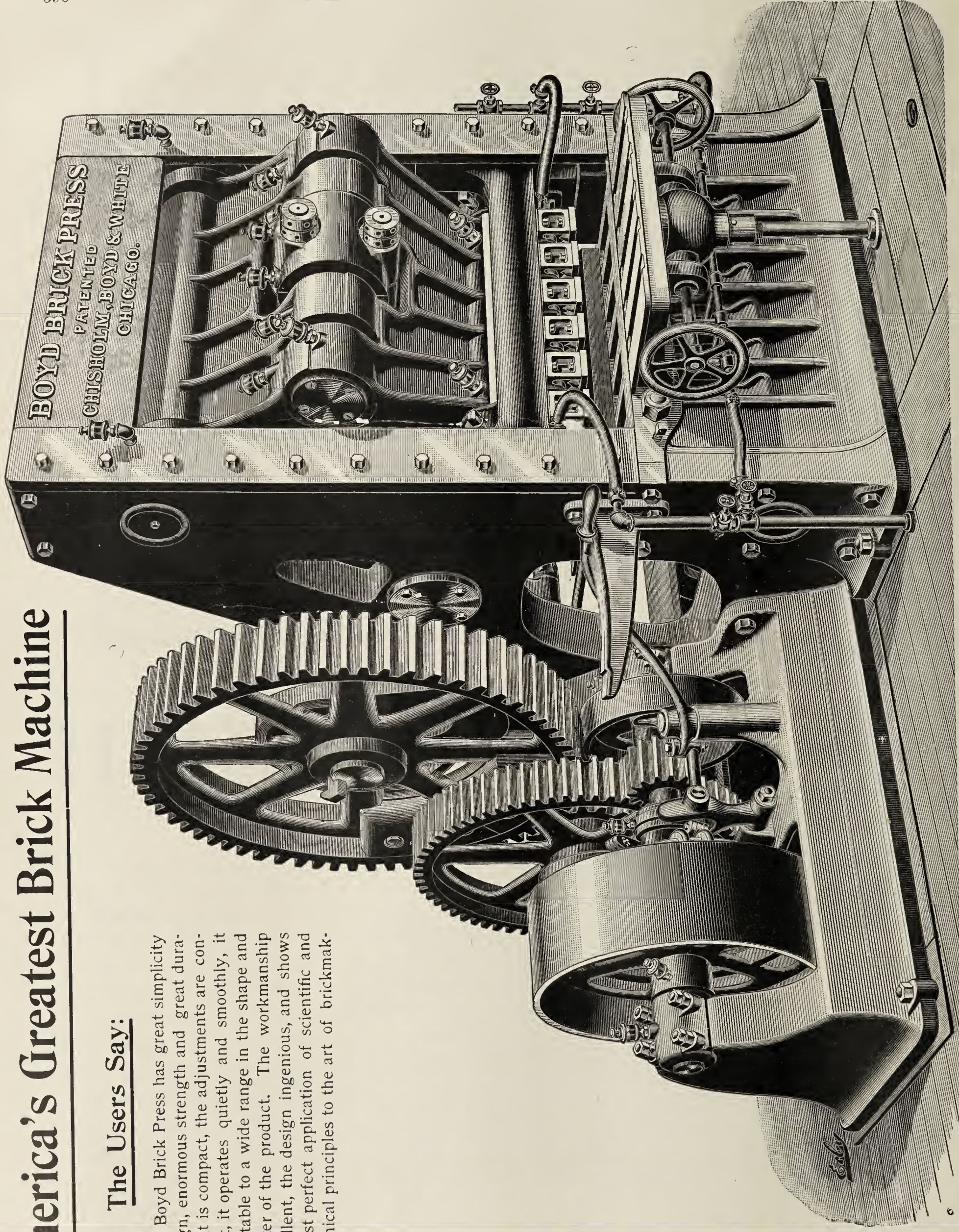
**JAMES W. HENSLEY,** Successor to S. K. FLETCHER, Indianapolis, Ind.



# America's Greatest Brick Machine

## The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,  
57th and Wallace Streets,

CABLE ADDRESS:  
"CHISHOLM, CHICAGO"  
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.



# Success for the Brickmaker.

## A BRICK PLANT

Equipped with our machines and system is universal in its work, and will produce at lowest cost per thousand, common building brick and fire brick, as well as high-grade front or face brick.

## NOT THEORISTS.

We are not theorists. We are practical business men—engineers in our profession. We have made a success of our business by making success for our customers. The Brick Plants designed, equipped and started by us are living monuments of our success. The Boyd Presses sent on trial have always enhanced our good name and remained to charm our customer.

## WHERE ARE YOU?

If the Brick Machine Maker won't guarantee you satisfactory burned brick from your material, don't you think you better find some other machine man who will do so, or else abandon the enterprise? Surely there's danger some where, and the machine man knows it. If he gets cash or notes for his machine he's safe, but where are you?

## A STRAIGHT OFFER.

The Boyd Brick Press will be placed upon the yard of any responsible firm on trial, and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the brick shall be satisfactory after being burned.

## Pressed Brick, Fire Brick, Paving Brick, Common Brick.

A....  
SURE  
THING

FOR  
BRICKMAKERS.



We will construct and equip a Brick Plant of any capacity desired, for any responsible party, furnishing Brick Machines, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of Brick, and turn the Plant over to him in proper working order, under guarantee of satisfactory results as to quality of product and cost per thousand; the loss to be ours in case of failure.

## CHISHOLM, BOYD & WHITE CO.,

OFFICE AND WORKS:  
57th and Wallace Streets.

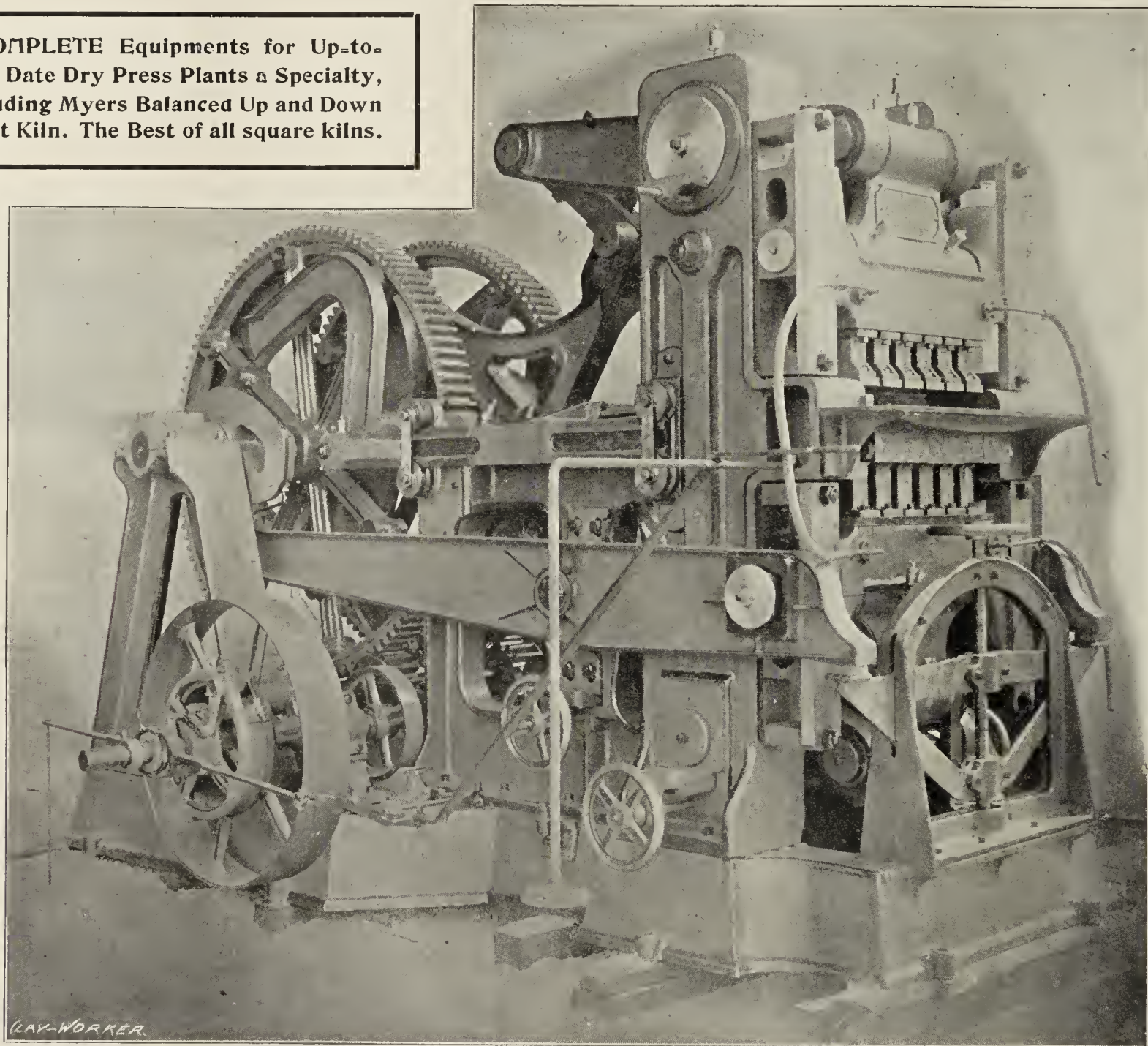
CHICAGO.



# The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

**C**OMplete Equipments for Up-to-  
Date Dry Press Plants a Specialty,  
including Myers Balanced Up and Down  
Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

## The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

ST. LOUIS, MO.

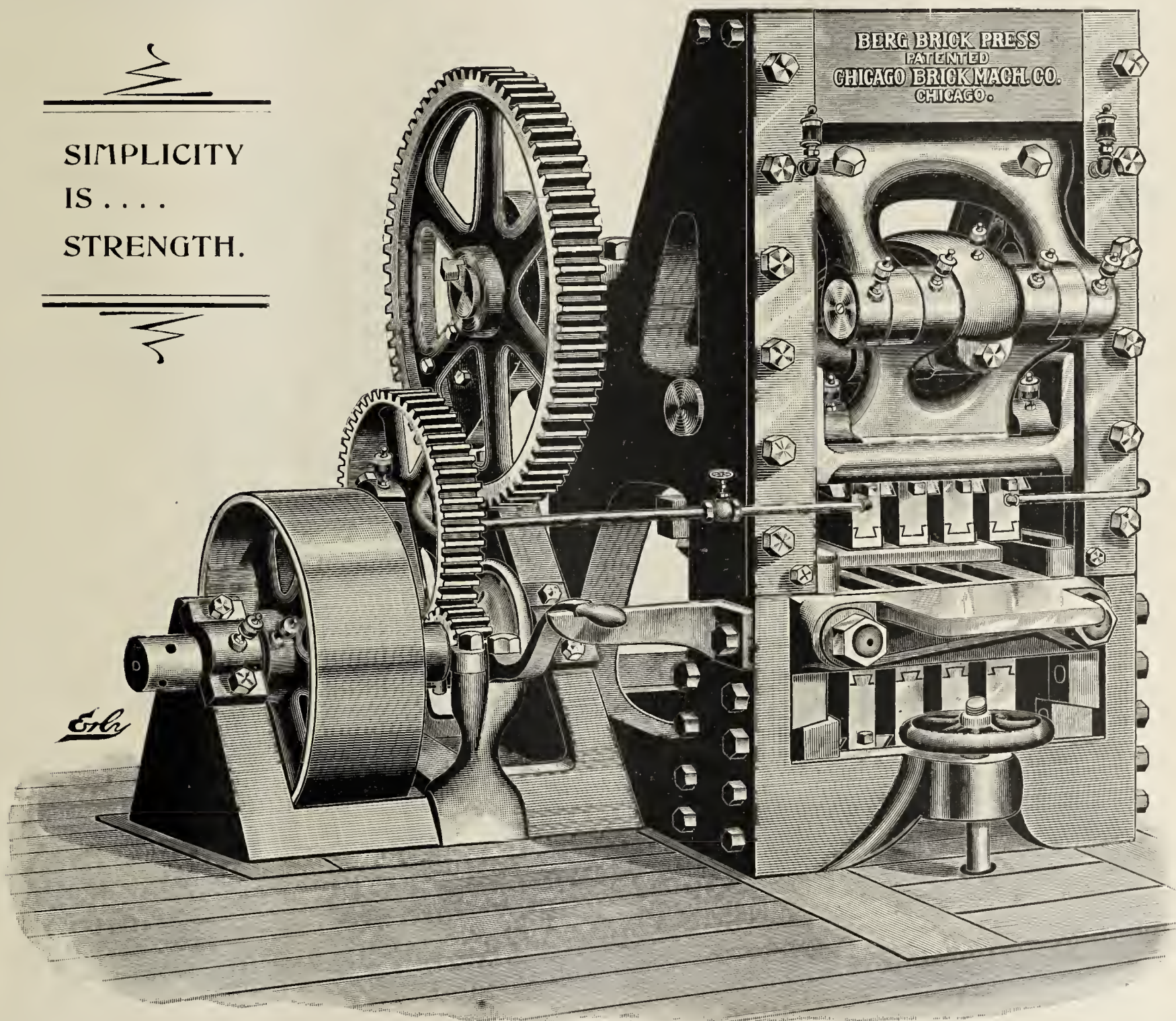


# The BERG BRICK PRESS

Is Pronounced by the U. S. Government—the Highest Development of the Art of Making Brick. . . .

ENTIRELY ORIGINAL IN MOVEMENT.

SIMPLICITY  
IS . . . .  
STRENGTH.



Absolutely Unbreakable.

Fully Guaranteed.

No Experiment, has been running successfully more than a year. Simplest and Strongest of all Dry Presses. Many new features. Send for Circular.

Our Stiff Clay Machinery is just as good in its line as our Dry Press. Most modern in Design and Construction. Makes highest grade of Paving and Building Brick and Drain Tile. Also the latest and highest development of Soft Clay Machinery, combined Disintegrator, Pug Mill and Brick Machine. Only successful down delivery mill for making large tile.

In fact, anything you want—and all Up-to-Date.

CHICAGO BRICK MACHINERY CO., 225 Dearborn St.



# The Survival of the Fittest.

THE inexorable law of the "Survival of the Fittest" is well illustrated in the continued success of the **SIMPSON BRICK PRESS**. It was one of the first successful dry presses manufactured in America and from its introduction has held a leading place. The improved **SIMPSON PRESS** is a thoroughly up-to-date machine and embodies many excellent features, that make it invaluable to the brickmaker who wishes to make the best quality of Press Brick—at moderate cost.

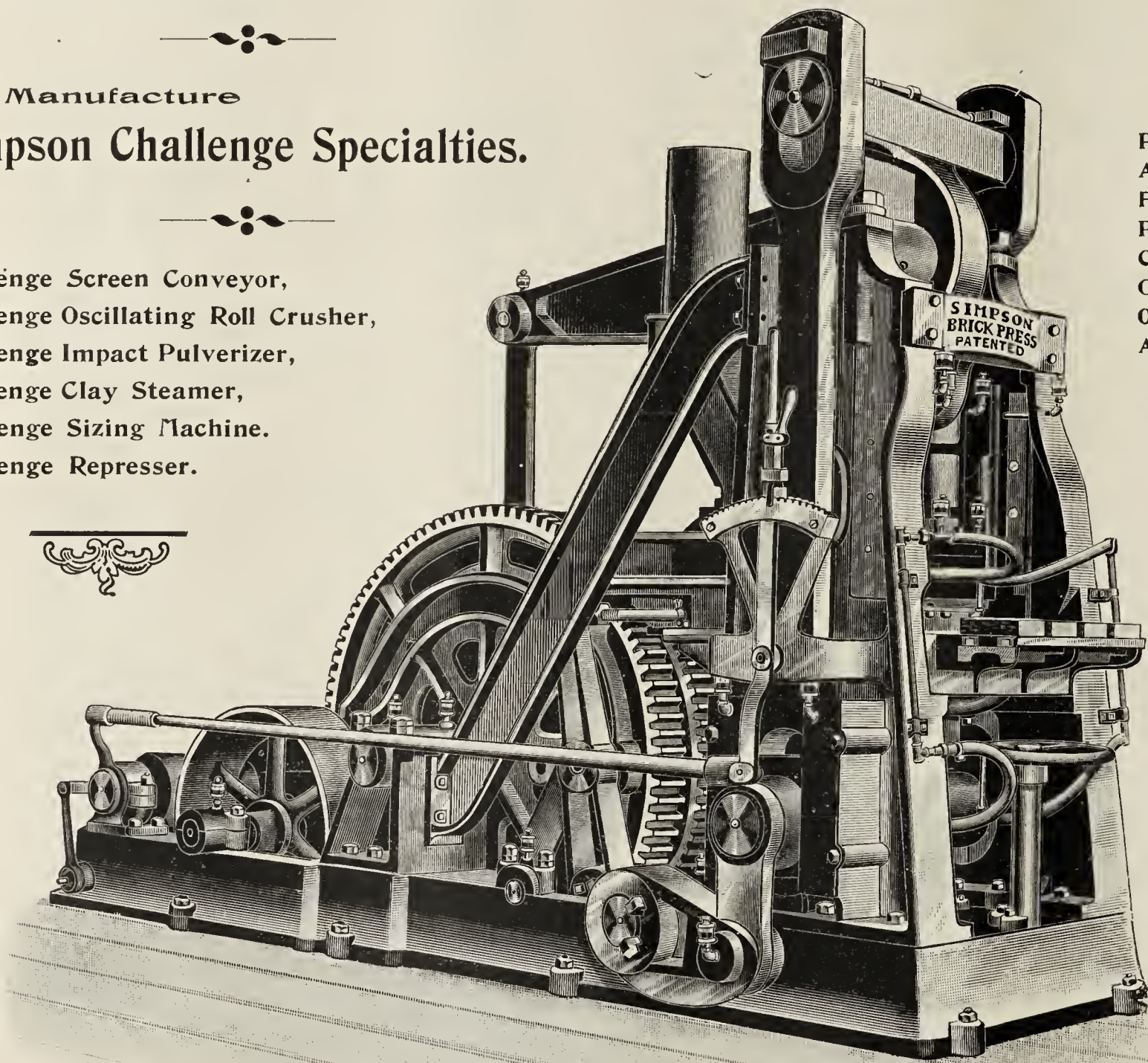
We make a specialty of complete equipments including every device required on a modern press brick plant. Don't fail to get a list of our new improved Challenge Clay Preparing Machinery.

We Manufacture

## Simpson Challenge Specialties.

Challenge Screen Conveyor,  
Challenge Oscillating Roll Crusher,  
Challenge Impact Pulverizer,  
Challenge Clay Steamer,  
Challenge Sizing Machine.  
Challenge Represser.

PRICES  
AND  
FULL  
PARTICULARS  
CHEERFULLY  
GIVEN  
ON  
APPLICATION.



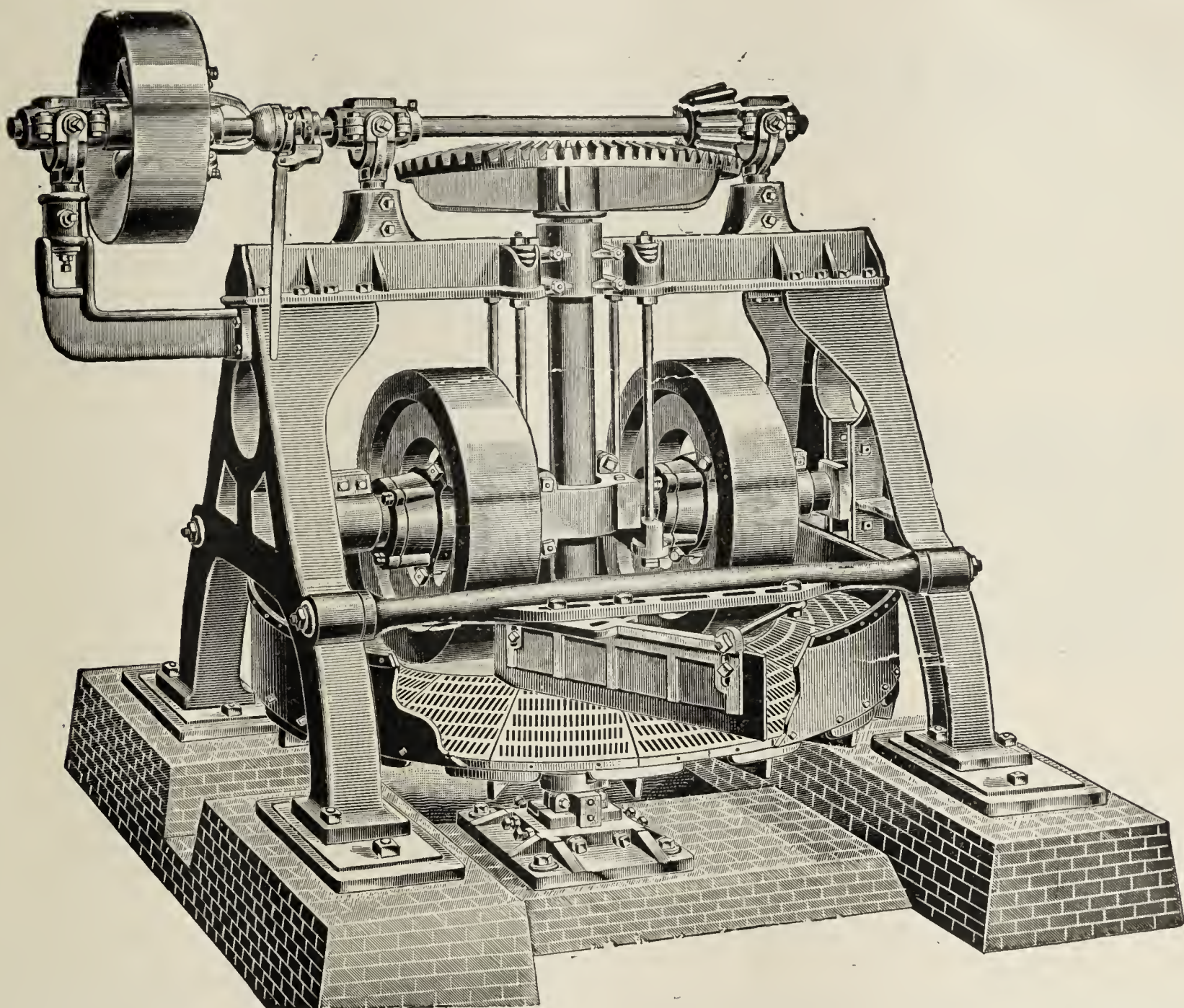
Simpson's 4-Mold Brick Press, Model AA, New Style. BUILT IN 4 SIZES.

## SIMPSON MACHINERY CO.,

OFFICE AND WORKS: 77th and Jackson Ave. (FORMERLY STORMS AVE.)  
Grand Crossing, Ill.

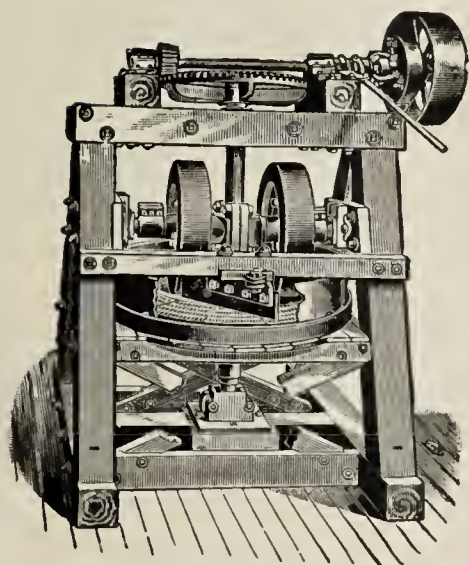
CHICAGO.





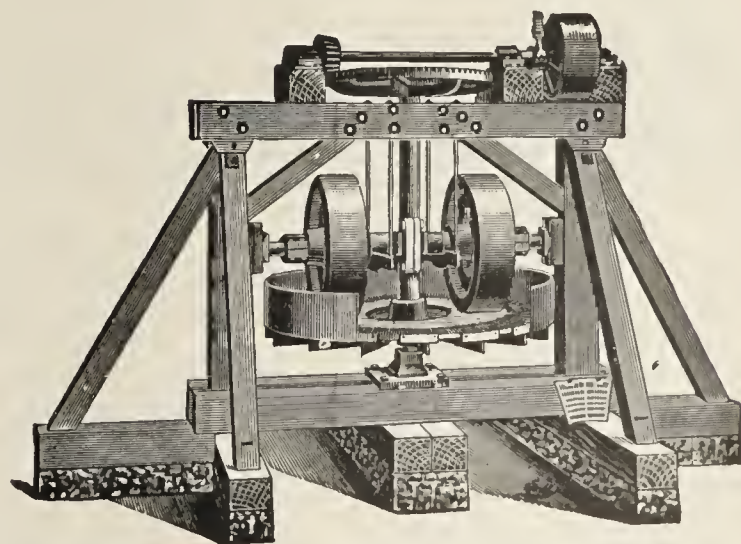
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,  
WOOD FRAMES.

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All Sizes and Price
to suit
Any Size Plant.
~~~~~

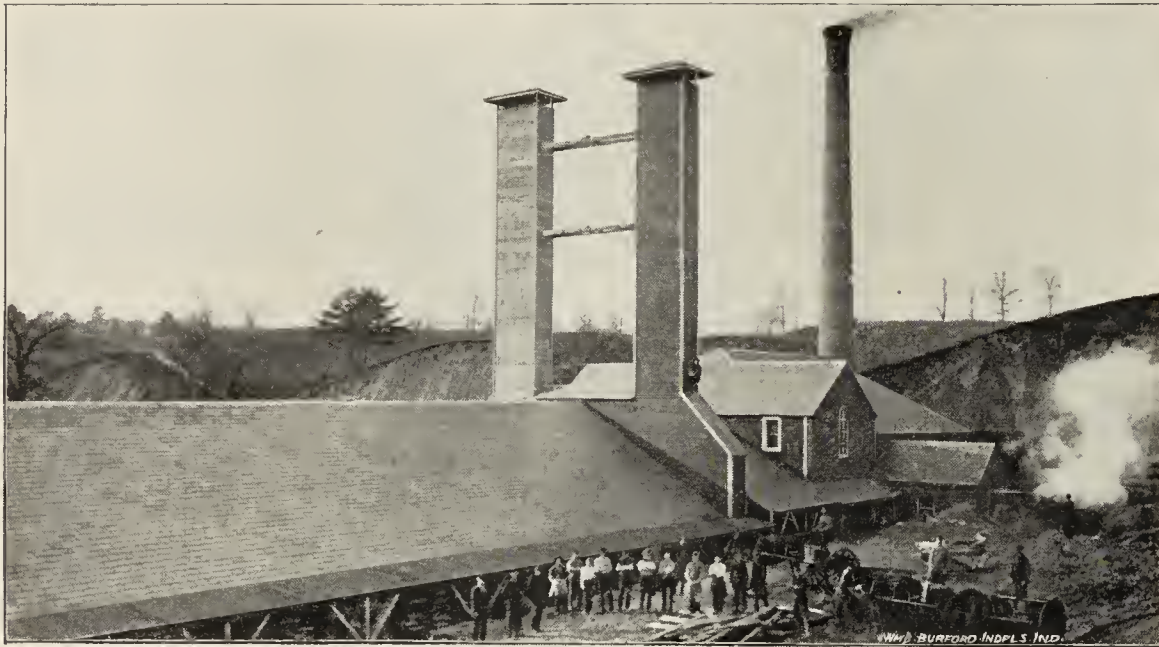


.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,  
U. S. A.



# A PICTURE AND A LETTER.



Best Brick Co's Plant, Mechanicsville, N. Y.

THE STANDARD DRY KILN CO.,  
Indianapolis, Ind.

We send you photograph of our Drier, and would say in regard to working of Drier that it has done all we expected and all you claimed for it.

As we only used it about six weeks before shutting down, we cannot say much as to cost of running on account of the extreme cold weather, which necessarily would take more coal; but even under unfavorable conditions we had no trouble in turning out 43,000 thoroughly dry brick a day, and from the way it has worked in cold weather we know we can average that many every day and dry them all right.

Yours very truly,

BEST BRICK CO.,

W. N. CARY, Sec.

Mechanicsville, N. Y., Jan. 17, 1898.

## The STANDARD IMPROVED BRICK AND TILE DRIER

Can be depended upon. There is no chance about it. It works good to-day, to-morrow, next day, next month, next year. Whether the conditions be favorable or otherwise—whether the thermometer be up or down—it does its work, if given ordinary attention.

The fact that its output is large is quite important. The more brick, the more money. But the fact that the drying is done thoroughly and well, is even more important.

Besides being a "money-maker," The Standard Drier is a reputation maker. **Isn't that the kind you want?**

### Out of Other People's Mouths.

"Our entire output is made from a Shale clay, which is difficult to dry; but The STANDARD DRIER has successfully accomplished its purpose and aided us greatly in making a VERY HIGH REPUTATION for our goods."

Terra Haute (Ind.) Brick  
and Pipe Co.

"The 'STANDARD' is drying my soft mud brick PERFECTLY.

Brother Brickmakers, if you contemplate putting in a Drier, don't fail to correspond with this Company."

D. P. DeLONG, Prop.  
Glens Falls (N. Y.) Brick Co.

"We are drying 40,000 soft mud brick every day with The STANDARD DRIER. They are acknowledged by all brick experts to be the strongest and most perfect brick in this market."

National Brick and Terra Cotta  
Co., Passaic, N. J.

"I make 35 M stiff mud brick every day and have NEVER HAD TO SET A WET BRICK. I look upon the purchase of The STANDARD DRIER as one of the best investments I ever made."

JAMES FLOREY,  
Downingtown, Pa.

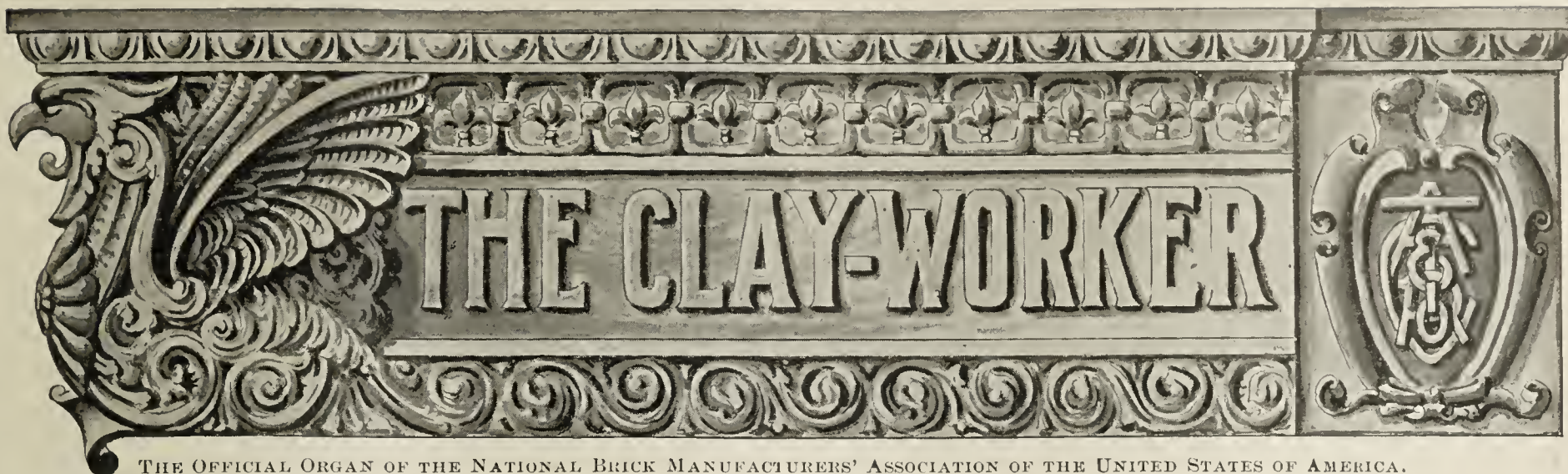
SEND FOR OUR BOOK, ENTITLED "A DRIER THAT MAKES MONEY."

## The Standard Dry Kiln Co.,

186 South Meridian Street.

INDIANAPOLIS, IND.





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX.

INDIANAPOLIS, IND., MAY, 1898.

No. 5.

Written for the CLAY-WORKER.

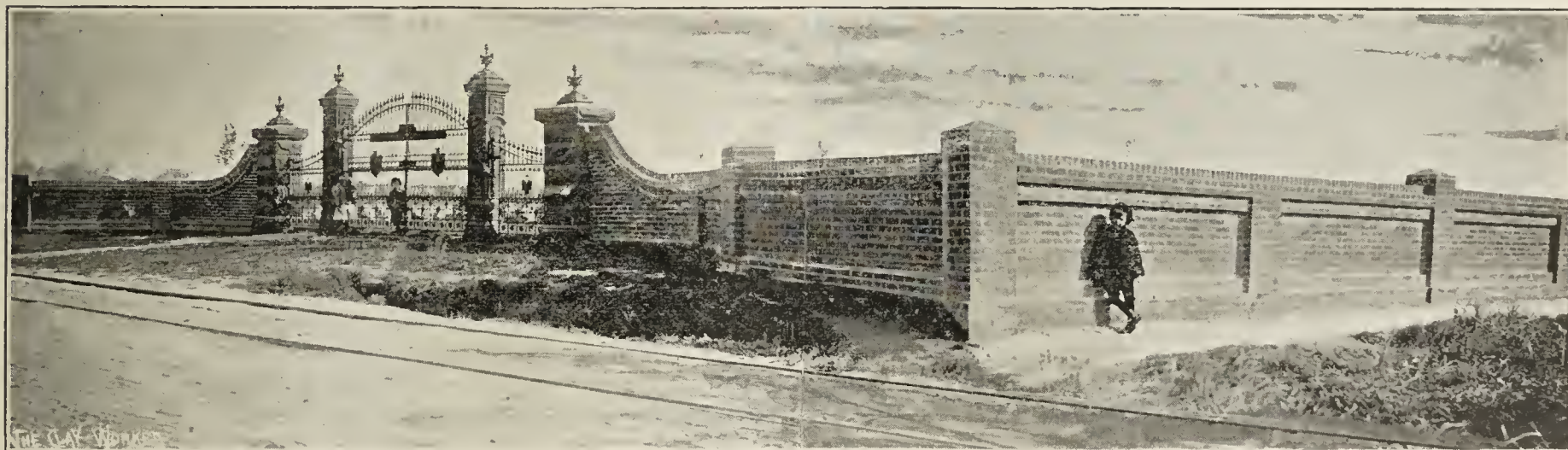
### A BRICK FENCE.

BY LOUIS H. GIBSON.

OUR PICTURE SHOWS a brick fence built by the government at Hampton, Va., surrounding the national cemetery there. It will be a delight when we have reached that stage in civilization when we do not need fences of any kind for other than agricultural purposes. This condition does not obtain at this time, hence there are a few who know enough to build permanent fences where they are needed. In this city there are a number of partition and back yard fences of brick. While more expensive at first they are more permanent than those of wood. In England a brick fence and curbing is quite common. It is rendered decorative through

only two or three feet high, and in such instances they are rendered decorative, and at the same time are not exclusive in appearance.

Say for ordinary uses a brick fence six feet high above the grade cost a dollar a running foot. This would assume it to be nine inches thick and the two top courses be laid in Portland cement. This would represent a cost of about four times as much as a cheap, unpainted, tight board fence, which is usually made five feet four inches high, and a little over twice as much as a carefully made, substantially constructed and capped tight board fence painted on both sides. The brick fence would last more than ten times as long as the wood fence and would cost nothing to maintain. It would never have to be repaired or repainted. The one on the inside and the passer by on the outside would feel more respectable because of its construction. The tight board fence is the relic of the pioneer period and the period when one neighbor did not



A BRICK FENCE, NATIONAL CEMETERY, HAMPTON, VA.

the use of good design and workmanship. In France one finds many fences and walls of this character. Even in the farm villages, courts are built with the domestic structures, such as stables, out-buildings, storage rooms, etc., in front and the dwelling in the rear of the enclosure. The best view from the house is from the rear. Thus it is, that we find there that which would be the front yard with us, at the back part of the enclosure. The enclosing walls or fences are quite decorative in many instances. Sometimes this work is done with molded brick, again of common brick with stone decoration, and not infrequently, geometrical patterns are used. This example of enclosing dwellings within walls of this kind is not to be emulated, we would say, but shows an example of the manifold uses of permanent enclosures of this character. Sometimes they are

wish another to see his back yard or the confusion which it contained. While we are progressing in this way we have not yet given up the fence. We wish to maintain the divisions. If we must do this, why not do it in a permanent, economical and dignified manner? We are reminded of certain parts of the old world, even in the agricultural sections, where they are without fences. But this is not from exalted civilization. It is from lack of a certain kind of civilization. Women and dogs are used to keep the stock out of grain. The modern barb wire atrocity is better than that. We may not hope to compete with the latter in agricultural districts, but in communities where permanent division fences are desired a properly constructed brick wall is the most stable and in the long run the most economical.



Written for the CLAY-WORKER.

## RED PRESS BRICKS.

BY CHARLES H. MELCHER.



HERE ARE SOME in the brick trade in the Eastern part of the country that believe the red press front brick has had its day, and present conditions seem, to a very great extent, a verification of the assertion. It is true that the various colored bricks are used in nearly all of the prominent operations, and it is a rare thing to have an applicant for a red brick for front purposes. The red press brick was so ex-

clusively used in the city of Philadelphia for a long series of years—in fact, nothing else in the brick line had ever been used—that the appearance of our streets, or the buildings that lined our streets, was so monotonously red as to be painful to the eye of the beholder. The omnipresence of red bricks and white mortar has often been the subject of unkind criticism from visitors otherwise disposed to commendation.

The first departure in this regard was made by the introduction of buff bricks for front uses; these, laid in red or brown mortar, presented a very enlivening appearance. Their popularity was impaired by their increased cost as compared with red bricks; this, for a long time, prevented their general use. Competition eventually so reduced the price of these buff brick as to make the demand very extensive and their production quite a feature in the trade.

In a little time a novelty appeared in the shape of an iron spot or Pompeian brick, and this seems to meet the popular taste at this time. The durability of color, or, rather, their almost total exemption from stainage or discoloration of any kind, was a prime factor in engendering their adoption. The unsightly whiteness that appeared on the red brick fronts after every lengthy rain-storm became a very objectionable matter to property owners, and they were consequently glad to adopt a building material that dampness would not affect.

I do not think it possible for these new colors to entirely exclude the ancient red from the building world. Purchasers will doubtless fancy the different colored bricks, as they do the different colored paints, and some among them will surely incline to the once popular red. Many of the public school buildings in the city of New York are being constructed of red bricks, and they are used in numbers of other structures as well.

Feeling, then, that red press brick cannot be entirely excluded from the building world, a few thoughts in reference to their production may prove of interest. There are few men in the trade to-day that can recall the existence of what was called the "rub" brick, the immediate predecessor of the press brick. Of course, the best molder in the yard was selected to make these bricks, one whose work was as free from cracks and other blemishes as possible, and every possible attention was given to the preparation of the clay from which they were to be made. After reaching the proper condition, they were rubbed daintily by hand and set in the choicest part of the kiln for burning. Let me observe here, that there is nothing like the human hand for giving smoothness of surface and elegance of finish to a fine brick. It is rough work for a very useful member of the body, to be sure, but no competent substitute has been discovered as yet. It was impossible at that time to obtain anything in the brick line better adapted to fine front work than these rub bricks. They were the best the age could produce in the way of a fine article.

Then came the hand-press, an improvement of great value that decreased price and largely increased production. It was considered, and should always be considered, that the proper tempering of the clay in making a fine red press brick is of

paramount importance. Any neglect or inattention in this primary process will be of fatal significance when the finished brick comes from the kiln. Before the introduction of the revolving wheel the clay for these bricks was tempered by hand, or, more properly, by feet. The clay was hauled in a huge pile in the fall of the year and exposed to the action of the elements until spring and the brickmaking season appeared. These atmospheric influences greatly benefited the material and aided the tempering in a very substantial way. As in the case of rub bricks, the best molder was selected to make the bricks, one whose work was as free from sand flaws as possible, and who had pride enough in his handiwork to endeavor to have them right in every particular. It was of great importance that the presser should be a man of good judgment and steadiest habits, giving constant and closest attention to the bricks drying on the floor preparatory to pressing. It was imperative they should be of uniform consistency at the time of pressing, in order to have an evenness in size and perfect corners and edges. It frequently happened that the presser was required to push them tightly together along the edges of the floor in order to prevent them drying too rapidly, and at times moisten them with water or cover with carpets for the same object. Those toward the center of the floor would be turned on edge to quicken their drying. After pressing on another floor, they were allowed to remain there until dry enough to rub and be wheeled into the shed. Large roofs on wheels were pushed along these drying-floors, so as to protect the work from rain, and could be moved forward or backward, as the occasion required. By means of these roofs the presser could secure the desirable effect of outdoor exposure; this was of great value to them, and yet had quick relief from the storms that are so frequent in the brickmaking season. An inattentive presser would soon have large quantities of green bricks that had become too dry to be properly pressed; a lack of these was excellent testimony as to his efficiency.

If the many press brick now being made on plastic clay machines were allowed to become a uniform stiffness before pressing, there would undoubtedly be a great improvement in every essential to a perfect article. Then, too, if, after pressing, they were allowed to remain for a period of time on the cars before being taken into the drying oven, it would benefit them greatly. The quick action of the furnace is at all times a trying ordeal for the green brick to undergo; it is an able agent for the development of every possible imperfection. This is the case at all times, but should the brick be too soft to handle safely, this drying furnace is a fell destroyer, and unfits it for any but the roughest use. And whether the brick be made by hand or on machine, the attention given it at that point immediately preceding the pressing is what gives regularity of size and perfection in almost every needed particular.

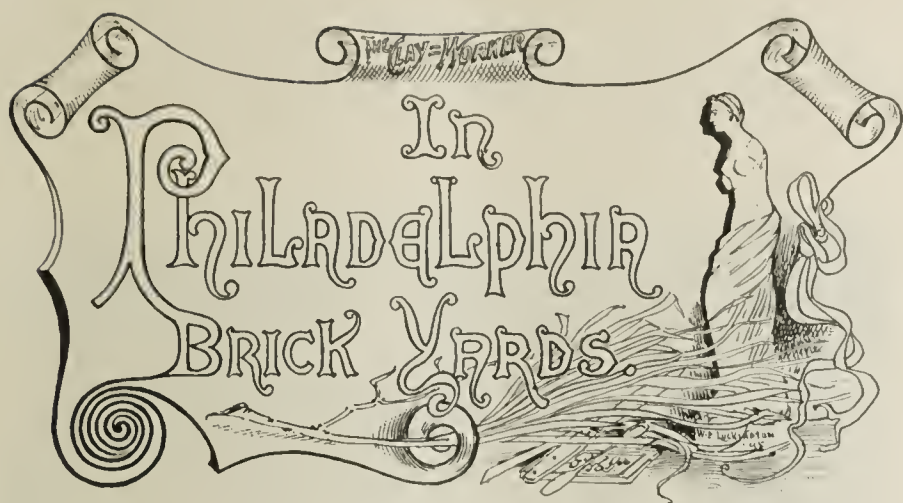
The question will be asked, Why all this extra cost and care, when the consumer is satisfied with present results and will not pay for any improvement on the same? It is true the question of revenue is a vital one, and merits chiefest consideration. You are in the business for the purpose of gathering its financial fruits, and for that only. Excellency of ware is vastly secondary to magnitude of profits; gold, not glory, is desired. If new methods are costly, they are not profitable, unless in addition to improving your goods they prevent waste and consequently decrease cost of production. If, to save a few dollars, you neglect the proper tempering of your clay, you will certainly find it the falsest economy. Good wages were always paid to a good presser, and one that attended to his duties properly usually stayed many years in the one yard.

A red press brick, properly made and burned, is a "thing of beauty" in the way of a building material, and it is safe to say that, though there is at present a decline in its popularity, yet it will always have its admirers and be the subject of use by people of artistic taste.

It makes me blue, it must be said,  
To see the "yellow journals" read.

—[Exchange.]





### AROUND THE SMALL YARDS.

**A**WAY IN THE NORTHWESTERN section of the city there may still be found the small yard, with its boundary line marked by the two-acre limit, and the work restricted to the methods of the hand gangs alone; where past customs are still believed to have more rock-bottom safety in them than the present progressive systems, aided by nineteenth century machinery. With a calm sense of absolute conviction these owners will tell you that the only brickyards making any money at all are those that have only a small plant, and have therefore only small expenses attending them. I was almost convinced by one gentleman that it was better, ten thousand times, to make a million and a half bricks and sell at a good profit than to have a big plant, covered with the name of a large corporation, which would make thirty to forty million brick annually, and yet never be able to declare a dividend. It all seemed logical enough to me, but then I don't know "nuthin'," so I didn't do no konterdictin'.

Jumping off the car at Twenty-seventh and Somerset streets, I walked into Flood Brothers' yard. This is but a small plant, an adjunct of the larger one at Kensington. Everything seemed at a standstill, except that a few loads of clay were being dumped on the ground. Over all the ten or twelve acres, only the wind showed any sign of life, but by foraging around I found the foreman, who informed me they would start up again in the course of two or three weeks. They usually run about eight or nine hand gangs, and last year managed to turn out between five and six million bricks, hard, salmon and stretcher. Two eight-arch kilns and open air drying sheds was about the complement of this yard's make-up, so that it wasn't necessary for me to hire an express wagon to carry my note book.

Over at Twenty-ninth and Lehigh avenue I came across Benjamin Bertolet & Son's plant, where they were working like troopers. This is a small, compact little yard, covering two and one-half acres, employing five hand gangs. Starting two years ago, the Bertolets put up two eight-arch kilns with a capacity of 150,000 each, and with three hand gangs set to and made nearly a million hard, salmon and stretcher and pressed brick, increasing the gangs to four last year, and turning out and selling a round million. This year they expect to turn out a million and a half. This expectation being almost positively assured, the Bertolets are enthused.

William F. Albrecht's plant, at Thirty-first and Lehigh avenue, is slowly but surely being hemmed in. On the north, east and south whole rows of two and three-story houses have been erected, while on the west his neighbors, to the number of probably two thousand—the quietest neighbors a man could have around him—are grouped in a cemetery within ten feet of the engine room, thus leaving him little more than an acre to work on. All clays have to be hauled and dumped into the shed to feed the Chambers machine, which still works merrily on to the tune of 45,000 daily, and turning out last year not less than fifteen million, of which they were lucky enough to sell over twelve million; and this represents a fair sample of their work for the past six years. One 80-horse-power engine and boiler

and forty hands have been kept going all the year round, but next fall will see the close of this prosperous little brick plant, and before the readers of the Clay-Worker hear from them again they will have clay to burn in another location.

MITSCHKA.

### A NEW EXPLOSIVE ESPECIALLY ADAPTED TO CLAY BLASTING.

At the convention of the German Clay, Lime and Cement Manufacturers' Association the properties of the explosive Roburite, which in many quarries and clay banks has taken the place of powder and dynamite, were described by Dr. Macckler. It is claimed for Roburite that it is the safest explosive; it does not explode on being struck ever so violently, nor on coming in contact with a flame. To prove this assertion, several grains of the explosive was put on an anvil and hammered without an explosion or even ignition having taken place. When put in the flame of a gas blast lamp the material did not explode, but melted and burned quietly. Roburite can be exploded only by means of fulminate of mercury. The explosive power of this comparatively new material is to that of dynamite in the proportion of 5 to 6; it is four times as powerful as powder. What makes it so valuable is the property it has of combining the pushing action of the powder with about the explosive power of dynamite.

The evolution of gases in the explosion of Roburite takes place slower than with dynamite, and hence differs from the



DINNER HOUR ON BERTOLET'S BRICKYARD.

latter in its effect. The explosive under discussion does not freeze, and can be used in winter with the same ease as in summer. For mining clay it has been found best to work in offsets. The holes are drilled in distances of from six to nine feet and more; the distance from the edge to the line of holes also varies from six to eight feet. According to the nature of the material to be mined, the charge fills from one-third to one-half of the depth of hole. The blasting is done either with fuses attached to the fulminate caps or by means of an electric spark. The price of Roburite is from \$18 to \$20 per hundred pounds, according to quantity and freight charges, which, by the way, are very low, owing to the safety with which it may be handled.

In describing Russian porcelain factories, a German writer mentions the fact that in one establishment the clay slip is freed from iron particles by being run through iron brushes made magnetic by an electric current produced by a small dynamo.

A new kind of porcelain is being talked of in interested circles. The new kind is not molded in the plastic state, but the dry materials are ground very finely and melted in an electric furnace at about 3200 degrees C. The liquid porcelain body is then cast with heated refractory molds. In this case a glaze is not necessary. The advantages claimed are reduced cost of



manufacture and almost no shrinkage on cooling, the latter point being especially important in the manufacture of precise instruments and measures of all kinds. By means of a process not yet published the inventor hopes to be able to render the cooled mass malleable as well as to make re-fusion much more difficult. Cum grano salis.

Written for the CLAY-WORKER.

**PHILADELPHIA'S OLDEST CLAYWORKING ESTABLISHMENT—THOUGHT TO BE THE OLDEST IN THE UNITED STATES.**



**W**HAT AN ACHIEVEMENT! Fancy keeping a manufactory going for two hundred and fourteen years! Surely this would put to blushing many of the old European factories that make it a point of advertising the date of their first establishment. The Remmeyes are well known throughout the Keystone and Empire States for their fire clays, bricks and pottery. This latter plant stands at 2637-2659 Cumberland street, away over in the Kensington district. The plant, which was destroyed in June, 1896, has again reared its head in a fine three-story building, with a frontage of 300 feet and a depth of 400 feet, in the center of which stands two fine up and down-draft muffle kilns. Within the four walls of the building proper may be seen, in the molding and jollying rooms, every form of stone and pottery ware, pitchers, demijohns, basins, dishes, pans, and everything in clay pertaining to the good, clean, healthy side of the kitchen, from a small pickle jar in nice white glazed pottery up to a fourteen-gallon stone demijohn for something else, all of which is under the careful superintendence of Henry H., brother to the senior Remmey.

Under the guidance of the son, R. H. Remmey, I was able to inspect the model-room, wherein are set up the forms of basins, jugs, pitchers and dishes that are turned over for the use of the hands in the jollying room. Here the lathes, fed by the Corliss 75-horse-power engine, keep the puggers and disintegrators going at a rapid pace, thoroughly eliminating the harsh substances from the clays, which are an admixture of Perth Amboy and local clays, after which they are treated by the pounder and well washed previous to being dumped on to the slab by the side of the jolly-man, who starts his lathe going, thus setting his model revolving at a rate of 1,800 revolutions per minute. The transfer of the clay from the slab to the mold



RICHARD C. REMMEY & SON'S POTTERY.

occupies less time than it does to write it, and immediately the wooden paddle is brought down, and very dexterously it is inserted into the mass of clay, pressed down, the offal thrown out, the thumb brought into play, and the mouth and edges nicely finished. It is then handed to the assistant, who transfers it to

the steam drying rack, where it remains for thirty-six or forty-eight hours, when it is transferred to the glazing department, afterwards being placed in the muffle kiln, where it is treated to a baking for forty-eight hours at a temperature of 2,400 degrees. In this way over two thousand gallons of clay are con-



A GROUP OF DOMESTIC POTTERY.

sumed daily, or an average of fifteen thousand each week, thus employing over one hundred hands throughout every day in the year. Large shipments are made of this stone and chemical ware to the Eastern States, and trade is being opened up with some of the Western States.

Their latest achievement is in the glazing of brick, and from some of the samples seen one cannot but conclude that their work will be highly successful.

On the outer wall is posted this announcement: "Strangers are not admitted within these gates." But the Clay-Worker was the open sesame and pass-word, and after a well-proportioned sense of praise was given for "the paper of Mr. Randall," your correspondent spent a pleasant hour within a pottery that was first started in the year of our Lord one thousand sixteen hundred and eighty-four. W. P. LOCKINGTON.

**THE CERAMIC ASSOCIATION OF THE OHIO STATE UNIVERSITY.**

**I**N THE MEETING of April 5th Mr. R. C. Purdy gave a description of the trip taken lately by the class of '98 to the Hocking Valley (see April Clay-Worker), illustrating the most interesting details by blackboard sketches. Next in order were reviews of late articles published in the clay journals. Mr. A. V. Bleininger, having recently read a paper on "The Manufacture of Portland Cement" before the Engineering Society, was requested to read it again. The paper, which was quite lengthy, treated of the several processes of manufacturing Portland cement, their advantages and disadvantages, and of the different machines and kilns, stress having been placed upon the importance of chemical control and constant physical testing. The main features of the different apparatus were illustrated by means of blackboard diagrams. Before the close of this college year Mr. Bleininger will present a paper on "The Testing of Cement."

Patriotism prevented the students from attending the meeting of April 19th. The Seventeenth Regiment having left the city on that day for Tampa, Fla., the boys thought it their duty to attend the public demonstration in honor of the soldiers.

On May 5th the first part of the programme was a paper by Mr. L. E. Barringer on "The History of Brickmaking." Mr. Barringer treated this "old" subject in a bright way, which was calculated to give an insight into the life and customs of the old nations who were the pioneers in the brickmaking line. He also described the rapid progress of the art during the last fifty years quite comprehensively. This paper was followed by



one on "The Manufacture of Sewer Pipe," read by Mr. Post. The question given out for discussion in the next meeting was: Given a certain kiln; which is the most economical way of burning it, firing it direct with coal or with fuel gas, the fuel to be of the same grade in each case, and the generator to be close to the kiln? The arguments must be supported by calculations. The balance of the session was devoted to business. The Ceramic Association, taking great interest in athletic matters, has done more than its share in a recent subscription for the college athletic fund. It was decided to have the '98 society picture framed and hung in the recitation room.

Written for the CLAY-WORKER.

### HINTS ON BRICKMAKING.

BY R. B. MORRISON.



**A**FTER DECIDING that you have a market for your product, and clay that will make a good brick, and a site for the plant located for convenience of shipping, the next move is to carefully plan your works with a view to convenience and economic operation. Machine for making brick should, if practicable, be located next to clay mine; dryers or drying yards should be located between machines and kilns. The battery of kilns should be built with their ends to the dryer. For convenient and rapid handling of brick from kiln to cars, it is best to have tracks at both ends of kilns. Let your side track fork before reaching the kilns, making a track at each end of the kilns; then let them come together beyond the kilns, and extend it five hundred feet beyond the junction, so as to hold twelve cars on this single track. Then they can be moved to either end of the kilns for loading. The track should rise gradually beyond the kilns, so they will move readily to the kilns.

Every part of the plant should be located so that it can be quickly drained; drainage is one of the first things to consider. Location of boiler and engines should receive careful thought. Engine and boiler house should be detached, as insurance will cost less, employes be safer, and the engine is not exposed to dust that is inseparable from a brick plant. All buildings



THE MASCOTTE JUG—Nearly a Century Old.

should be fire-proof, walls of brick and roofs of felt and gravel. Metal roofs are not proof against the sulphuric gases from smokestacks and burning kilns.

In a former series of articles the writer discussed the most economical way to build a plant. One plan is to put up ma-

chinery and power and begin without artificial dryers or permanent kilns, and make brick on the ground to build dryers, kilns and all permanent buildings. It adds largely to the cost to buy and ship brick to construct the plant. This affords an opportunity for a practical test of your clay, and should there be



GLIMPSE OF A GREAT POTTERY KILN.

mistakes made and bricks damaged, they could be utilized in constructing the necessary buildings.

I would advise adopting a plan for drying that would make sun heat available in the summer season, and let the yard take the place of, or at least supplement, the artificial dryer. In these times of close competition it behooves the manufacturer to utilize every force and adopt every device within his reach to economize, so as to enable him to minimize cost of production. If tunnel dryers are used, drying racks can be placed on each side of tunnels, and brick can be taken from cars and placed in the racks. Then, when dry, they can be placed on cars and moved to transfer tracks, thence to kilns. There is no doubt that cost of drying can be materially reduced in summer by this plan.

The boiler and dryer furnaces should be so located that fuel can be thrown from car to the furnaces. All details should be well considered before adopting any plan. If mistakes are made in arranging the plant, it costs money every day it is operated. "Of all sad words of tongue or pen, the saddest are"—what? A plant should be planned with a view to increasing its capacity at any time without destroying or altering what is already built, and should you double your capacity, the plant would simply complete the original design.

Before the details of the plant can be perfected, it is necessary to determine the kind of machinery you will use, and this again depends on the class of brick to be made, whether soft, plastic or semi-dry brick, and in making this decision the tastes and prejudices of your prospective customers are to be taken into account. It is not best to attempt missionary work and undertake to educate the people at the expense of the brickmaker. If the market requires soft mud bricks, and no other kind are used, it is best to make that kind. If, however, both kinds are used, then I would advise the making of plastic brick, as they have less water in them when made, hence require less heat to



dry them. They can be hacked or repressed direct from machine, and will have less waste in burning than soft mud bricks—this from the standpoint of cheaper production. So far as durability is concerned, especially frost-resisting qualifications, soft clay brick are equal, if not superior, to any other class of brick, although the plastic brick are the stronger. For making common building brick or vitrified paving brick, I think either soft clay or plastic best, but for manufacturing fine face brick and ornamental designs, dry press brick are superior in finish, perfect shape and uniformity of size.

In reference to the best soft clay machine, or plastic clay machine, or semi-dry press machines, you must be the judge. There are several standard makes of machines of these three classes, all good of their kind. By consulting the pages of the clay journals you can secure names and addresses of the various manufacturers of machines, and by visiting plants and corresponding with brickmakers you can decide which suits you and your clay best. This, however, should be determined before the plant is built; then the machine manufacturer can give you a detailed plan of that part of your plant that will be adapted to his particular kind of machinery.

The same is true of dryers and kilns. A tunnel dryer would require one plan, a hot floor dryer a different plan. The mode of bringing clay from mine to machine must be arranged, whether by wheelbarrows, with carts and horses, or by tram cars. The latter is preferable if it can be arranged, for the clay can then be carried to any height desired before it leaves the car. Clay, when it leaves the car, should go downward to the crushers or disintegrators, and downward from these into the brick machine. It is much easier and cheaper to move clay downward than upward, and the cheapest and most satisfactory way to elevate clay is while on the car from the mine to the machine. Belt elevators are troublesome, and should be avoided as much as possible.

For preparing clay for machine, crushers or disintegrators are used, and answer every purpose in ordinary clay. If hard shale or clay with gravel or small stones is used, then a dry pan or wet pan may be necessary. The former crushes the clay dry, while the latter will crush and screen wet clay.

Written for the CLAY-WORKER.

### THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Eleventh Paper.

BY E. G. DURANT.



WE HAVE ATTEMPTED so far to present only the simplest form of construction. In doing so we have left out one item, questioning whether it had best be mentioned, as we seek only the best methods. In the interest of economy in outfit, and because there is really much good in the proposition, we now present an alternate to the more expensive method of fashioning corners. In doing so, however, we continue to view the employment of the "C" block as indispensable in securing the best results.

In Figs. 14 and 15 we show how an "A" block ( $4 \times 8\frac{1}{4}$ ) may be made to do duty in place of "C," and with no sacrifice of strength. Referring to the figures, it will be noticed that for this use "A" is cut short and set on end, and is supplemented by  $8\frac{1}{4} \times 12$ -inch lengths of the same block used both in the inner and outer courses, but which are laid horizontal, ending at the earliest point at which an  $8\frac{1}{4} \times 8\frac{1}{4}$  block can be made to take their place. The reader will readily understand how "A" so used can be made to do duty wherever "C" would otherwise be used. Fig. 15 shows as well its working for an inner as an outer angle (assuming that the inner is the face side). In using "A" for a casing block in place of "C," it will be made to alter-

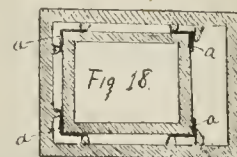
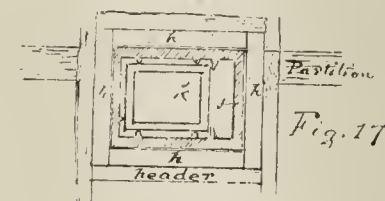
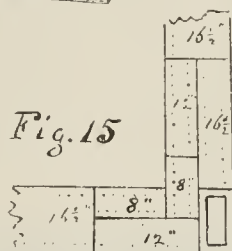
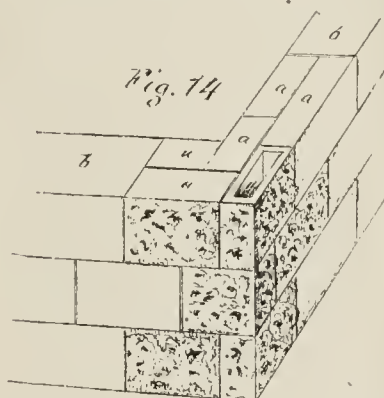
nate with a "B" block, cut short and used in the same manner; the lap in all such cases will be four instead of eight inches, but this will be satisfactory for casing purposes, and the use of a twelve-inch length of "B" (laid horizontal) in connection with "A" will at once restore the eight-inch lap in the further laying of the wall. Notice in Fig. 14 that the ill proportion that would be apparent to the eye in use of "A" as a corner block is in good part overcome by the use of a twelve-inch length having the same design, laid to abut it.

Leaving for the present the treatment of a higher grade of structures than those already introduced, let us give our attention to such special features as need to be presented in order to complete the class of buildings we have been considering. First on our list is the matter of

#### --Chimneys--

A most important feature in construction, as all will concede; for what can sooner destroy the comfort of a household, the beauty of its furnishings and the temper of its members than a smoky chimney? But a chimney need not be a smoky one in order to be classed as poor, for a deficient draft means an unsatisfactory fire, and hence in extreme weather an absence of solid comfort. Then there is another aspect of the case. It appears that a majority of the conflagrations which occur are due to defective flues; hence the question "how to secure the best" is well worthy of our attention.

We present first some plans suited to the class of buildings



under consideration—very simple and inexpensive, yet very effective and satisfactory. Fig. 16 shows this chimney as incorporated into an outside block wall. When used in an  $8\frac{1}{4}$ -inch wall an "A" block forms the outer course, as shown, and a chimney block, "J,"  $16\frac{1}{2} \times 12$  inches, exterior measure, having inner ribs, as shown, enclosing a flue block, "K,"  $7 \times 9$  inches inside, which is held in position by the ribs of "J," thus insuring a half-inch air chamber on three sides of it, while on the fourth side there is an air chamber of three inches. In Fig. 17 we see the same block as used in a frame structure or in a partition wall, or as passing through a roof; here it is surrounded by two-inch thick block "H" intervening between the chimney and any woodwork.

#### —The Four Prime Considerations—

To be kept in view in chimney construction are, first, a good draft; second, safety; third, good looks; and fourth, economy of cost. Let us see whether these essentials are provided for. As to draft, it has already become to a considerable extent the practice in good buildings to use fire clay flue linings, both to secure good draft and for safety. Whoever has had occasion to clear out the pipe-hole of a newly-constructed chimney of the ordinary type has noticed the rubbish left in the flue by the mason; if near the base of the chimney, a solid mass is often found, the drippings of the trowel, and from top to bottom the flue is usually smeared with mortar drip, which not only greatly

\*This article should properly have preceded No. 10 of this series, found in our April issue.—Editor.



impedes draft, but serves to accumulate soot, which further clogs. In contrast to this, a smooth section of flue lining, having a mortar joint once in two feet instead of every two inches, is presented. Another important factor not often taken into account is that the flue retains its heat to a much greater degree than in a chimney having a solid wall, the air chamber surrounding it preventing largely the heat's escape. Those who will keep in mind the fact that good or poor draft depends altogether upon the difference between the temperature outside and inside a chimney will need no further argument, and will be ready to concede that a 7x9 flue possessing the qualities referred to will be as good or better than an 8x12 as ordinarily constructed. As to safety against communicating fire, much may be truthfully said in favor of the chimney constructed as shown. Notice, first, an air chamber completely surrounding the flue, preventing the transmission of heat to the exterior of the chimney; second, the fact that instead of a joint that may possibly prove defective once in two inches we have a joint once in twenty-four inches, and that located twelve inches from any exterior joint, hence twelve inches of air chamber intervening; third, bring to mind how many walls show cracks about the chimney which indicate a settling of it, and remember that corresponding cracks are likely to be found in the chimney itself, and that these cracks are most likely to occur near the floor line, the chimney being held up at that point by contact with joist and header, and that such chimney cracks are likely to communicate directly with woodwork; remember, also, that a block chimney weighs less than one-half as much as a brick chimney of the same capacity, and you have hence to contend with a diminished liability to settle. As to good appearance, we call attention to the chimney sketched in Fig. 19, showing a chimney as it appears above the roof; the design is simple, but conforms to a prevailing style found on buildings of an excellent character. Of course, there may be as many styles as fancy may suggest, but a simple, well-proportioned shaft, like that shown, will always be in good demand. It will be proper to touch upon "good looks" within the house. How many interior walls are disfigured by soot stains carried through brick after heavy storms, and how many others by smoke and stain through defective joints! Against such liability the chimney presented may be deemed secure.

We now come to the consideration of strength. Of course, the great point of testing will be above the roof, from exposure to tempests. Will it be likely to stand the test? Its narrow joints may be urged against it, and its lack of weight as compared with solid brick. In Figs. 18 and 19 are seen a cross-section view, with an elevation of a chimney at and above the roof line. Notice in Fig. 18 how sheet metal angle strips at the cor-

ners "a" "a" "a" "a" are held in position between flue and chimney block, each wing of the angle being one-half inch wide and the strips eight feet or more in length, extending below the roof line, are made to do duty as resisting pressure and relieving the block of it. The combined width of the metal in

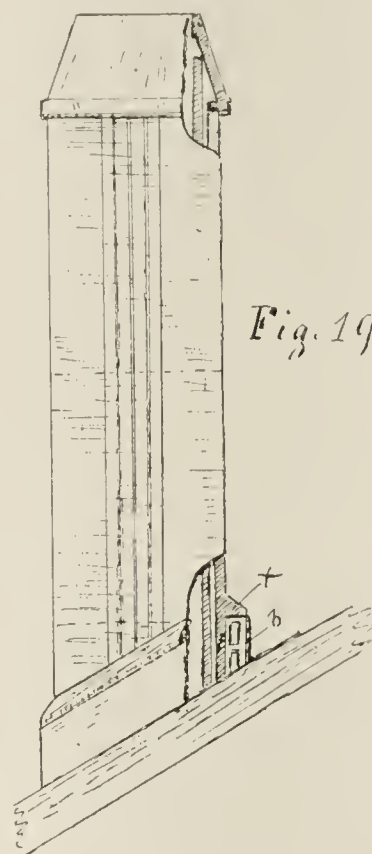


Fig. 19

each direction being six inches, it follows that an 18 gauge iron would offer great resistance to wind pressure, and yet such a set of irons, weighing not over fifteen pounds, would add but a small sum to cost of chimney, and could be had at any tinshop. We do not, however, deem such angle strips essential, but present them as an answer to any skepticism concerning strength of blocks themselves for this use. When it is remembered that to dislodge the chimney the flue block must be broken in two on a line at or near the joint of the casing block, and that the two are bound together as one piece by the lap of each upon the other, men intelligent as to strength of blocks will cease to question. Block chimneys are not new, but those of double form, as shown, are a great improvement over those heretofore used.

Referring to Fig. 19, it will be seen that a flange has been placed upon the section of chimney block at a pitch corresponding with roof pitch. This is, of course, done when the block is green. The metal flashing is secured between this flange and the two-inch blocks which surround the chimney at its base. These blocks are in four sections of 16½-inch lengths. (See the cross-section view at "X," where a section of the chimney has been broken away to expose the construction.) It will be noticed that the cap, which is hand-molded, is seen to rest upon both the inside and the outside blocks of the chimney. This is not deemed essential, as the inner and outer blocks support each other, and the cap is sufficient protection against weather conditions. The 3x10 air shaft forms a most perfect method of ventilation, and adds this valuable feature to the chimney. The outer blocks can be pierced for the placing of registers, both near the floor and ceiling of the rooms through which the chimney passes.

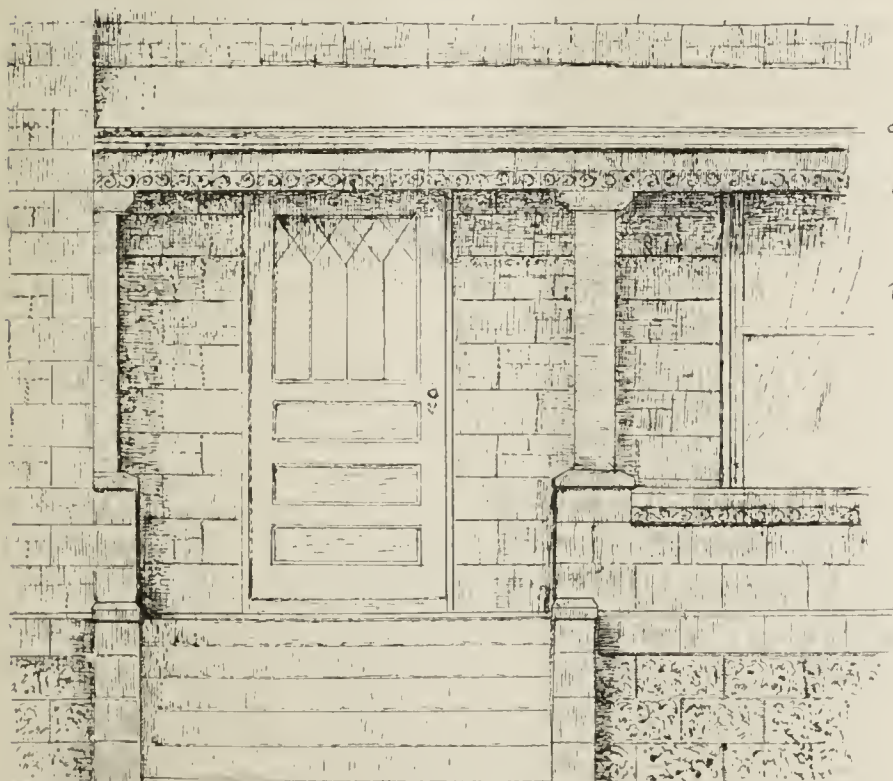


Fig. 20

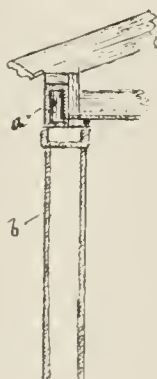


Fig. 21

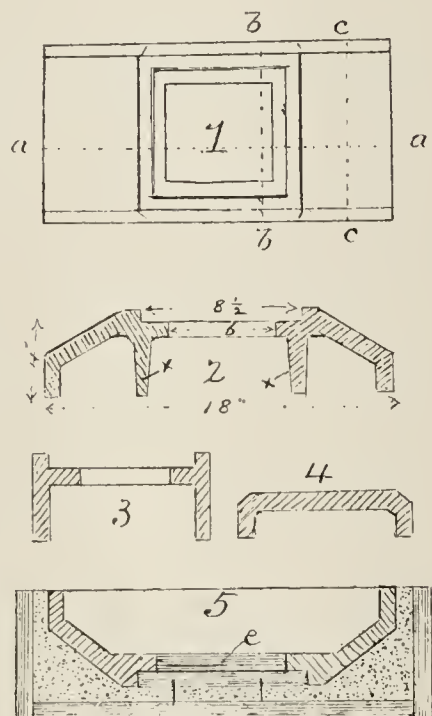


We now turn our attention to the further consideration of the construction of

—Spans and Arches.—

As we stated in a former paper, blocks can be used for such purpose with great facility, which statement we now hope to confirm. For a window or door cap a straight block, cut to any required length up to four or five feet, may be made use of, and we have seen very perfect six-foot lengths, but in extreme cases joists should be placed inside the cap, or made use of in connection with it, in the manner shown. In Fig. 20 is seen a span of a porch measuring six feet ten inches, and a vertical cross-section view of the same. This span is formed in the use of "A" blocks, cut to usual lengths, through which has been passed a 2x6 joist. A 2x8 joist being used as a backing so placed as to receive a ceiling, a 2x4 plate caps the blocks, to which a cornice finish may be nailed. In case ceiling is not desired, a "B" block may be substituted for the "A," in which case two pieces of 6x6 joist, or even three, may be substituted for the single piece used in "A." The columns shown are also sections of the block "B" cut to the requisite length, and the wall balustrade of the porch is formed in the use of "A" and "B" blocks, or of "A," "B" and "C," as the case may require. The cap and the base of the columns shown are hand-molded, and purposely of such simple design that the molds may be made in the shop of the clayworker. A wood mold may be first made, which shall represent the molded piece in a green state, due allowance being made for the shrinkage of the clay. As clayworkers generally may not be familiar with methods of making molds, we will briefly describe how the one under discussion may be made.

Sketch 1 is the block as you look down upon it. Sketch 2 is a cross-section of the same through "A" "A" of sketch 1. Sketch 3 is a cross-section through 1 at "B" "B," while sketch 4 is a cross-section of 1 through "C" "C." The wood model should not include the inner ribs "X" "X," for reasons apparent in working. The model being made, a box, shown in Sketch 5 in cross-section, is next made to receive it, and a cross section of the model is shown therein. The box should be about one inch deeper than the model, and a space of one inch be left on each of the sides, a few nails be driven into the bottom of the box and the nails be left projecting sufficiently to hold the model, so that its top shall stand exactly flush with the top of the box. Plaster of Paris should be properly mixed, as thick as can be poured, and then run into the mold so formed. In Sketch 5 notice at "E" a part darker than other parts; this is a wood section just fitting the opening. It has two or more dowel pins, that portion of the pin outside of the wood slightly tapering. This wood section is placed in position as shown before the plaster is run into the mold. The dotted section indicates the plaster of Paris after it has been run in, filling the mold even with the top. The sides of the model should be well greased to prevent the adherence of the plaster, and also very slightly beveled, so that it may be withdrawn after the plaster has set. It will be well to leave the inside of the box rough, or perhaps to drive a few nails in it, leaving a portion of the nails projecting, so that the plaster may be securely held inside the box. With the mold so formed, it only remains to pack the tempered clay into it. One with a little practice will soon be able to pack the clay evenly, say about one and one-quarter inches in thickness, into the mold, and then form the ribs "X"



"X," as seen in Sketch 2. When complete it should be struck off evenly with a wire, the top of the box sides being a guide. If a cap is wanted without an opening, the wood section "E" may be withdrawn before commencing to mold the cap, in which case the ribs "X" "X" may be omitted. If the proportions of the block when burned correspond with the dimensions given in Sketches 1 and 2, it will project about three-quarters of an inch on each side of the block on which it rests, making a neat finish.

The end view of the porch shown in Fig. 21 suggests a further use of the block as a cap to the corner block used in the walling of the steps. The illustration shows how a section of an 8 1/4 x 8 1/4 block, cut short and given a perforated bottom or set on end in the same receptacle made for the column, can be made to do duty as a flower vase on the side wall of the steps, harmonizing with its surroundings. The drip from the pot so formed, instead of soiling the walls, will drip through the cap opening and the block chamber beneath it to the ground. This is shown merely as suggestive of the easy and natural adaptation of hollow blocks to varied uses, adding attractiveness and insuring favor. The wide-awake block manufacturer may play "on a harp of a thousand strings" and be met half way by the architect and his clients.

In Figs. 20 and 21 fractions of the hand-molded block are shown used in connection with the wall columns. Such block are readily secured by cutting off at the desired point in the mold.

The reader will please to bear in mind that to this point we have confined ourselves to the treatment of buildings constructed in the use of blocks of the most limited variety deemed admissible in an outfit for their manufacture, and in the use of as limited a number of ornamenting rolls. We may sum up the outfit called for to the present time as embracing: Seven blocks susceptible of ornamentation; four construction blocks; two hand-molded blocks.

Before proceeding further, we ought to apologize to our readers for self-confessed lack of equipment for the work undertaken, for we are neither architect nor draftsman, and all we have done or hope to do is to make plain to others the methods by which certain desired and desirable results may be accomplished, and such as we deem requisite to meet the demands of the building public. Nevertheless, we shall in our next paper introduce higher forms of blocks, adapted to more artistic structures. We believe that architects generally will soon discover the possibilities wrapped up in ornamented hollow blocks, and execute work which we can only hint at.

### GOOD AND BAD BRICK WORK.

The present manner of laying brick in dead walls gives one the impression that the quantity of brick laid is of far more importance than the quality of the work done. The only way to obtain good solid brick walling is to either finish the joints solid with mortar every course, or make a shove joint; the former method takes too much time and material, and the latter is very rarely done except in very heavy buildings. The custom generally adopted is to spread the mortar on the brick (a portion only of which gets in the joints) and lay the brick on top, each succeeding course being bedded in mortar; but the longitudinal and cross joints are only partially filled, the hutting joint of the brick receiving a little dab of mortar gathered on the point of the trowel by cleaning the surplus mortar from the outside joint. Grouting every two courses in height with cement might be adopted for basements and first stories of buildings when great strength is required. Full headers for face brick are better than clippings, and should be specified for all heavy buildings. The face brick are often built up fifteen or twenty courses high before the backing up is done, a custom that should not be permitted, as it leaves the wall subject to many defects, as it cannot be well bonded or tied together sufficiently strong to be able to resist unequal strains sufficiently. For good, strong work the mortar joints should never exceed five-sixteenths of an inch in thickness.—Canadian Architect.



# THE ARTISTIC EDUCATION OF THE POTTER.\*

BY HERMAN C. MUELLER.



SOME YEARS AGO I was made the victim of a paper. It was not a newspaper! It was a paper which was read to me by its author. The paper was "on clay," and the author was a potter and a Christian. He started in with the beginning of the world, and cited the fact that Adam was made of clay by the Lord. He drew the conclusion that the potter was therefore of ecclesiastical origin, as the Lord himself had started the potter's craft, and was, so to say, the charter member of all ceramic associations. I do not doubt but that my friend, the author, deplored that

Moses was so laconic, merely stating that Adam was made of clay, so that we are still in ignorance as to whether he was squeezed through a pug mill or made by the dry dust process. All we know is that he "was fired," but this fact has nothing to do with the potter's business.

Well, I have little occasion to poke fun at my friend, the potter, since I start in the same manner. We can learn, though, out of this remarkable story of Moses, that the potter's craft was known and appreciated at a very early date. We may even say that the potter's art was the most ancient of all arts. The phenomenon that clay hardens by fire was soon discovered, and the pliable condition of the plastic material readily suggested the forming of useful and ornamental articles. Thus we find clay vessels used for the storing of water and grain, and for cooking and distilling purposes, coming from the earliest nations and tribes. Remarkable in this ware I speak of is the wonderful artistic conception of its makers. In shape and decoration the pottery of the Assyrians, Egyptians and Greeks is astounding. And not only the nations of classic culture show this artistic excellence; even otherwise uncultured tribes have developed pottery that is highly artistic.

Let us take for example our own Zuni and Pueblo Indians. While their pottery is of a low technical character, while they prepared the material and burned it in the most primitive manner, the artistic conception of the work is marvelous. The lines of the "shapes" are fine and expressive, and the decorations are chaste and appropriate. The greatest charm, though, is the great originality of the work.

It may be well to compare our own work with this coarse product of poor, ignorant savages. But such a comparison has its dangers; it may not be flattering to us. And the fact is, it is not! Not in an artistic sense! While we have made great progress in the technical phase, we have very little to show in the artistic development of our own pottery. I am not talking of exceptional cases, which I shall mention later on.

Let us take for example our own Zuni and Pueblo Indians. What constitutes art in pottery? It is, before all things, the character of the work! The connoisseur, the expert, will admire a genuine piece of delft ware, of Wedgwood china, of Sevres Dresden porcelain, of Italian majolica. He will find charms and beauty in an old piece of pottery that looks rather coarse and commonplace in the eyes of the occasional observer or the layman. Some will say, "This man is a crank." But this is not true. The value of a piece of pottery is always established by such experts. If anybody of reasonable conception of art and artistic work will make a study of pottery, he will soon become "just such a crank." He will look for character and originality first, and his senses will not be captivated by a non-descript combination of color and ornament. He will learn to see the beauties of a Japanese shape, and will go "crazy" on old Delft ware.

(Read before the Ceramic Association of the Ohio State University, Columbus, Ohio.)

Now, if originality and character constitute the value and beauty of pottery, how are we going to get it into our ware? Why should the savages, mentioned before, have it, and why should it be lacking in our work? It will be necessary, in order to explain this point more fully, to go back to the beginning of the development of some style of pottery. Let us take for an example the ware of our American Zuni Indians. These primitive people started to make vessels of clay. They took the clay of their own locality and discovered ways and means to work and burn it. As some vessels may have been used in religious ceremonies, or for other reasons, symbolistic or hieroglyphical characters or designs were scratched on. Some shapes developed for certain purposes,—the water and grain jar, the bottle, etc. Animals suggested shapes; idols were modeled out of clay, and by and by the work showed a decided original character—the character of a nation, of a certain culture, and of the material which was used for it. Let us give these poor savages credit for making the most of their material with limited means.

The result is the unique, characteristic and original pottery of the Zuni. Other more elaborate styles may or must have



HERMAN C. MUELLER, Superintendent Mosaic Tile Co., Zanesville, O.

shown the same development; that is, the formation of a peculiar style of work growing directly out of the material used, and out of the character of the people who developed it.

Thus we perceive the quaint character of the Dutch in the Delft ware, the classic conception and rigid form of Hellas in the Greek vase, the rich and Oriental warmth in the Persian and Moorish work, the fineness and exquisite culture of the French in the Sevres ware, etc.

The main point to be kept in view is the fact that each group developed its material and labor regardless of others; that they made the most of their opportunities without cocking their eyes forever in the direction of their neighbors and competitors. Their industries grew up like trees nursed by native soil. We may also mention the great local patriotism which helped each group to bring its work to perfection by the cooperation of everybody—by friendly intercourse. Now, another question: Do we here in the United States show such a zeal and desire to develop what we have? There is the rub! We



have started an era of imitation! Our pottery industry was started by foreigners—by English and German potters; the English potter making English ware, the German potter making German ware. Those who followed these pioneers in the business have simply continued to walk in the well-worn path. The aforementioned pioneers recruited themselves from the army of European mechanics or laborers who had learned their trade in the old country and could only continue to make the ware as their fathers did. And so it happened that the Ohio potter made white ware and imported his material partly from England, and later on from New Jersey, though he had a splendid material for stoneware at his feet. This state of affairs is still continued at the present time,

Outside of the factories of white, yellow and stoneware, we have during the last fifteen or twenty years developed a good many potteries which class themselves among the art potteries. The white, yellow and stoneware potteries are manufacturing staple articles—table and cookery ware. The art or majolica potteries are making mostly articles of luxury—jardinières, vases, stands, etc. These potteries are wholly dependent on the looks of their products, or mostly so, and the artistic phase of this work should be principally considered. I admit that most of these potteries deserve great praise for the great technical progress they have made, as the bodies and glazes in use leave little to be desired. I cannot be so liberal, though, in my comments when I consider the artistic achievements of these potteries. Most of them are creeping in the dark, and are giving us a chaos of all possible and impossible creations. Instead of developing their material and labor in one direction, they scatter themselves, and try to make everything that everybody else makes. And so it comes that, while they make many things, they have not developed any originality or character in their ware.

One notable and highly praiseworthy exception is the Rookwood Pottery, of Cincinnati. And what an enviable thing it is, from an artistic and even commercial standpoint, to get a reputation as it is enjoyed by the Rookwood Pottery! And how did this pottery obtain the great fame all over the world? By dabbling in all different kinds of ware and using all possible means of decoration? Not at all! This little coterie of potters and artists did not pay much attention to possible competitors. They developed their work and brought it to perfection. When anybody speaks to us now of Rookwood ware, we know what it is; we see before our eyes the rich, glowing vases, the exquisite and original decorations of this genuine art work. Mrs. Storer deserves great credit for her enthusiastic work in developing this institution, but she deserves the greatest praise for her having guided the artists along the true path of originality.

But the Rookwood Pottery is an exception. The average pottery is not run on this line. With most potters the cry is: "Something new! Some novelty!" We hear too much of "novelties." Instead of following up a certain "genre" or style of work for which the material and labor at hand is essentially fitted, the average potter clamors for "something new." He is watching competitors closely—too closely, in fact—and if he finds that somebody has made a lucky hit, he is post haste after it to get his share of the bonanza. The work in potteries is therefore anything but pleasant to the superintendent, and it is quite impossible for him to find the deliberation necessary for good and well-digested work. The manager takes trips to the East every few months, and brings home some samples of work. He pulls a snuff box from his pocket and lays it before his superintendent with the words: "Rosenstiel & Meyer sold four hundred dozen of this within two months! We must make it!" From another pocket he produces a candlestick. "I have taken an order for fifty gross of this; we must make it!" etc. The poor superintendent sees that these articles represent an entirely different character of work than his material is fitted for, but he must try to satisfy his boss. If he succeeds, he is making, at best, an imitation. Anyone that is acquainted with the state of affairs in our potteries will admit the general truth of this statement.

To make artistic pottery, the potter must become an artist, or the artist must become a potter. Many think the knowledge of making clay bodies and glazes constitutes a potter. This is an error; it takes more than that. If a man masters the material, he is in possession of something that is essential for a potter, but he must know more than that. If he should master form and have considerable artistic ability and training, he would be well fitted to enter into the work of a potter, but this knowledge is not enough. Besides being a chemist or an artist,

he must become a potter. Only then, when he is fully acquainted with the limitations and possibilities of the material, will he do telling work.

On the other side, the potter must try to obtain sufficient artistic knowledge and conception to enable him to have a judgment and to be able to speculate upon proper applications of his material for certain purposes. A material which may be a flat failure for a flower pot may make a fine ale pitcher. If he has the necessary imagination to detect the fitness of his material, if he has the taste to improve his ware by giving it the proper decoration, he will be a success as a potter. Such knowledge can be obtained only by hard and persistent study. The student of pottery should make himself well acquainted with the best examples of pottery. He should try to become familiar with the styles of all nations and periods. If he is in possession of some skill in drawing or modeling, he should copy the shapes and decorations of classical pottery, and should try to discover the characteristics of these examples. The greatest training an artist can receive is in the study of old masters. Afterwards, when the student has entered practical work, he should try to detect the best points of the material before him. It is quite impossible to start in with a correct idea as to what should be developed; much must be left to chance and the natural development of the work itself. But this does not mean work without system, or work in the dark. Speculative trials should always run alongside of practical work. In such a manner the potter would soon develop some style of work strictly his own, which would give him a decided advantage.

In connection with this argument, I will touch another point which should be of great importance to the students of a technical school. Ever since science has entered into our industries we are led to look down upon the simple empirical methods of former times. We hear the statement made everywhere that it would be quite impossible now to run a large factory without the aid of chemistry. Such a statement is quite true, yet it is misleading. While the manufacturer on a large scale needs the science of chemistry as a safeguard against possible failures, owing to the changes in the material and fuel—while this valuable assistance enables the manufacturer to adjust and experiment with greater economy, we cannot say that chemistry itself has ever added anything in the direction of artistic development, unless it was the helpmate of the artistic potter. It is therefore true that we have shown little artistic advancement, in spite of the great help the science of chemistry has given us.

The handworker, the artisan, is still the central figure in the clay industry. I do not intend to belittle the importance of ceramic chemistry, but the theoretical ceramic chemist stands in the same position to pottery as the painter or the sculptor who is able to design or conceive a design for a vase. Before either of the two can be of real good service to pottery he must become more intimate with the craft. He must learn to know the limitations of the material; he must be able to speculate upon the possibilities contained in the work; he must, in short, become a potter.

The chemist that will enter a pottery and stick to his laboratory without making himself acquainted with every practical detail of the work will be of little service to the business. The work itself is apt to make a sort of scientific clerk or accountant out of the chemist, as he has to watch his analytical work closely, weigh the material and keep track of trials, and perhaps of all material used in the pottery. His work is therefore somewhat removed from the actual work of the potter, and he may continue in this way a long time before "he gets his hand in it." It will be easily understood that such work cannot bring any result towards artistic development, and the actual worker—the mechanic who turns the ware and molds the shapes—does more towards it than the well-educated scholar. My advice to our young friends of the ceramic department is, therefore: "Stick your fingers into the clay as soon as you have a chance; try to produce something by actual hand work as soon as you put your foot inside a pottery."

When we look upon a piece of pottery, we notice at first the shape, afterwards color and decoration, and lastly, if we are in a position to judge, we examine the material. If the piece is really a fine piece of work, all these points must be well considered, and not only by themselves—they must form a harmonious ensemble. To obtain this the union of the technical and artistic worker must be complete.

If we look for samples of great work done, we may name great artists like Peter Fischer and Della Robia. One was a great bronze caster, the other a great sculptor and potter. Their greatness did not lie in the fact that they were great artists and conceivers of form, and it did not lie in their great technical knowledge alone. Their greatness consisted of the wonderful combination of artistic conception and technical knowledge which is expressed in their work.

It seems that in our age of academic education "the hand worker" has been relegated to the rear, and this is to be de-



within the province of the brickmaker. Why must a man that desires to obtain correct architectural detail purchase such work from a terra cotta factory? Simply because the brickmaker has no artistic education. The same may be said of the roofing-tile makers and all others engaged in the clay industries.

I have not touched the commercial phase of pottery, and will only reluctantly mention it. The fact is that we owe much of our era of imitation to the tyrannical dictation of the merchant. Would it not be better if the merchant engaged in selling pottery should also try to become a potter? The great founders of famous European ceramic industries were all great and enthusiastic potters, as Krupp was a great iron and steel maker.

We are all engaged in a common pursuit—to manufacture clay products. Our aim is to improve the work. The central point of the efforts of all of us is the work itself. We may say that men of various training are necessary to labor together—the chemist, the artist, the empirical man, the scientific man, the merchant. If it would be possible to unite the knowledge of all these crafts in one man, he would be the ideal potter. But as this is quite impossible, we may try to do the next best thing—to endeavor to make a genuine potter out of all the men who assist in producing and “handling” pottery. To find the right path is left to the young man who enters the clay industry, and to assist in pointing out the right path is the duty of everyone engaged in the clay business.

The founding of a ceramic chair in the Ohio State University is of the greatest importance for the ceramic development of the United States, and I am glad to perceive that the interest in pored. It is quite natural that a young man who has just finished his course of education and is the happy possessor of a highly ornamented diploma should have a good opinion of himself. I can attest to this feeling from my own experiences. When he enters the “shop” for the first time, he may have an idea that he stoops a little, and he may look with a rather patronizing air upon the rough-looking characters which hustle around the factory. He may be quite ignorant of the fact that these workmen represent also a great deal of learning, and that they have just as much pride in their knowledge as he has in his education, and he may get into trouble before he knows it. He has perhaps fixed ideas as to the attack of the work, and cannot understand why not everything is changed according to his suggestions. He may talk about old fogies, etc., and as the others retaliate, his position may become embarrassing. Right here should be the turning point of his career. He should try to become the friend, the comrade of the workmen; he should induce them to show him the practical “tricks of the trade;” he should allow his knowledge to be absorbed by the noble work of the potter.

The artist and the artisan are not so far apart as some people imagine. We may say that art came directly out of the hand work, and the greatest artistic achievements came during a time of great appreciation of mechanical skill. It is for this reason that I would counsel my young friends to become practical potters, as only the practical potter holds the key to true success.

Artistic conception is essential in all work in connection with clay. Some of the students may know that they will be called upon to assist in the management of a brick factory. Is it essential to have an artistic education as a brickmaker? This question seems absurd. But it is not. I think that a man who is able to follow the artistic idea of the architect, and can even suggest the decorative qualities of certain mixtures and textures of material, has a great advantage over the man who simply makes brick, without troubling his mind about esthetic architectural or decorative points. Can it not be possible that an opening should be found in his locality for a better grade of work than common brick? We know that it is almost impossible for a brickmaker to produce anything creditable in mere ornamental work. The small ornamented diaper blocks, the molding bricks now in the market, present a rather lame aspect to the man versed in architecture. Yet such work is strictly

this institution is steadily growing among the clayworkers. Your Professor Orton has undertaken a great task, and has proven himself equal to the emergency. It is my opinion that he has done great work with limited means. I hope that the ceramic department of the Ohio State University will keep on growing, and that every potter will become an earnest supporter of the school.

Your forming a Ceramic Association is also a step in the right direction, and your desire to co-operate with the practical men of the business by patiently listening to their advice shows the proper spirit. I therefore congratulate you upon your school and the earnest zeal of its teachers and students.

#### OLD JOHN.

THE SUBJECT of this sketch has long been a privileged character about the works of the Hydraulic Press Brick Company, of St. Louis, where of recent years he has been a pensioner, and allowed the freedom of the yards as a just return for long and faithful service. In his younger days John was noted for his superior intelligence. Many interesting stories are told of him by the officers of the company, with whom he is a favorite.

One of the best is told by Vice-President Eliot. One eventful day, in the usual daily round of toil, John accidentally fell



OLD JOHN, THINKING.

into an old well that workmen had carelessly covered over and forgotten. It was thought that John's time had come, but, determined to save him if they could, the workmen rigged up a derrick, fastened ropes about him and began to “hoist away.” When part way out the ropes began to slip, when, with almost human intelligence, John seized the rope in his teeth and held on like grim death until he was safe out of the hole.

John's regular duties were performed without a driver, and for a number of years he acted as a messenger between the upper and lower yards. Whenever a message was to be sent, a note was written and hung on a hook on John's bridle, and he would never fail to go direct to the office door with it and stand patiently until the note was taken from his bridle, when he would at once go about his work hauling clay.

Of late years John (Old John he is now) has led a life of comfort and ease, not turned out to die, but simply released from the daily grind, provided with full rations, and allowed to go and come as he wills, and as Mr. Eliot humorously puts it, he wills to do a thinking part—“just stands about and thinks.” If he could talk, Old John would controvert the common belief that all great corporations are soulless. Perhaps if all workmen were as faithful as Old John, they would have less cause to complain of heartless masters.



Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK—Eighth Paper.

—Glazed Brick.—



THE LAST KIND of glaze mentioned, the tin enamel, has a very interesting history. Before the invention of the European porcelain, and before the introduction of white ware, tin-enamelled goods practically occupied the place now taken by white ware and porcelain. Their use was extended to ornamental as well as useful purposes. The tin enamel was already known to the Arabs and other Oriental nations, but its highest fame was reached in the fifteenth century, when the great artists of Italy made it the foundation of their work.

In the faience glazes we have a striking example of how a body composition must depend upon the glaze. The glazes being opaque, the body color is completely hidden, and hence does not enter into consideration. From an examination of the composition of faience enamels it is seen that they all have an excess of silica; in fact, they carry so much of it that the bases of the glaze cannot act upon the surface of the body, being already held by the silica, and hence on an ordinary body no bond is formed, especially at the lower temperatures at which this class of glazes melt.

The result is that the glaze and body are not firmly united.

quirements; it must be as colorless as possible, brilliant, and sufficiently hard so as to resist ordinary table use. These conditions are met by a glaze mixture consisting of whiting, oxide of lead, kaolin, feldspar, quartz and borax. Here, we see, part of the silica is replaced by boric acid, which, like the silicic acid, combines with the bases, but which, unlike the more powerful acid, reduces the melting point and gives brilliancy to the glaze. Owing to the solubility of borax in water, it must be made insoluble before it can be applied to the ware. This is done by melting together all the borax, all of the feldspar and part of the flint and whiting in separate crucible furnaces, or in saggers put in the kiln along with the ware. The melted mass or frit is then ground together with the remaining ingredients, lead oxide, kaolin, whiting and flint. Owing to the fact that boric acid volatilizes at higher temperatures, it cannot well be used in glazes exposed to a temperature exceeding cone No. 3. A typical white ware glaze is represented by the following composition, expressed in parts by weight: Feldspar, 12 parts; kaolin, 38; flint, 17; carbonate of lime, 8; oxide of lead, 21; fused borax, 8.

Probably the oldest glaze known to mankind is the salt glaze. Little need be said about it, as the process of applying it is well known. Salt glazing can be made use of only with clays rich in free silica, a fact which we can explain quite readily. Salt is composed of sodium and a gas—hydrochloric acid gas—forming a chloride of sodium. On coming into a hot atmosphere the salt is decomposed into the acid gas and the base, sodium.



FRONT VIEW RESIDENCE AND WORKS HEILMAN BROS., Tiffin, Ohio.

and sooner or later the former will break or crack off. It is obvious that, since we have an excess of silica in the glaze, we cannot expect its bases to act upon the silica of the body. We therefore are compelled to reverse the process and put bases into the body which may be attacked by the silicic acid of the glaze. Lime being the cheapest flux at our disposal, we add it to the body. By this means a mutual action between body and glaze takes place, and they will unite firmly. This explains why tin enamels require bodies rich in lime. Some of the old faience ware contained as high as 20 per cent. of lime, but in modern practice it is limited to 12 and 14 per cent. Too much lime renders the clay brittle, causing it also to crack on being subjected to rapid changes in temperature.

Somewhat higher in temperature than that of the preceding glazes is the melting point of the white ware glazes. Unlike the earthenware, stoneware and faience, white ware is entirely an artificial body. As we know it in tableware, it is a more or less vitrified white body, covered with a transparent glaze. According to the grades of material used, the color of the ware varies from white to cream, hence the names white granite and C. C. (cream colored) ware. The glaze in all cases is colorless. The body is a mixture of kaolin, ball-clay, feldspar, flint and whiting. For white ware the glaze must answer several re-

The latter, being now free, is seized by the free silica of the clay, and with it forms a glaze—sodium silicate. In this glass-forming process at the high heat involved some alumina, lime and iron is also drawn into the fusion. Of course, the finer the silica of the clay is divided, the better and smoother a glaze will be obtained. From the nature of the case we cannot expect to produce the salt glazes with the uniformity and evenness of the slips. Often they will be found to be crazed and beady in appearance. Yet the writer has seen salt-glazed front brick manufactured on a commercial scale which were remarkable for the striking color effect they produced. The glaze was quite thick, of a greenish color, and was applied to a stoneware-like fire clay body.

There remain yet to be discussed the so-called porcelain glazes. This type is the most important one for manufacturers of the highly durable glazed brick. What do we call porcelain glazes? Under this head we assemble all glazes and enamels not containing any lead or boracic acid. This distinction is perhaps somewhat arbitrary, but it will suffice for our purposes. There are many examples of porcelain glazes, one of the best known being the Albany slip. This highly interesting glaze is a fine-grained impure clay of glacial origin, but redeposited by sedimentation in quiet or slow-running water. Its chemical



characteristics are the high contents of iron, lime, magnesia and alkalis, and the low percentage of clay substance. The Albany slip is in itself a perfect glaze, and becomes bright and glossy at a temperature between cones 5 and 8. It also has the peculiarity of never crazing or cracking on a body, this being due to its nature. As it is a clay itself, its coefficient of expansion, as a rule, coincides with that of the body, and a perfect equilibrium is maintained. A drawback of the Albany slip is the comparatively high temperature required to fuse it. But it must be remembered that every equally durable glaze requires about the same heat. If a natural glaze is intended to be used, the body must invariably be of a refractory character. Many attempts have been made to reduce the melting point of the Albany slip through the addition of lead oxide, borax, etc., but in every case its beauty as well as its durability has been impaired. Although it is not impossible to increase the fusibility of the slip without losing all of its valuable properties, in most cases it is not advisable to do so. The Albany slip is worthy of the attention of the prospective glazed-brick manufacturer, and offers a promising field for successful practical work. As the natural slip clays produce only dark colors, varying from light brown to black, the question arises, How may lighter colors be obtained with glazes corresponding to the slips in fusibility and durability? In order to solve this problem we must produce artificial compounds. This we can do with the aid of four minerals: kaolin, flint, feldspar and whiting. The compound produced

ically than such low in those silicates. Body particles thus dissolved by the glaze are diffused throughout the melted mass. For instance, if the surface of the ware is coated with a color, say a cobalt blue, the blue will be found to be spread through the glaze covering it. If the color, though attacked, is not uniformly divided, the glaze will have a tendency to crack off. In low-fusing glazes it often happens that the body particles which are taken up are not diffused equally throughout the mass, and as a result the glaze will not infrequently crack off. Roughness of the glaze surface is usually due to the intense action between the glass and the body, especially if the latter is high in quartz and the glaze basic and forming a thin layer, as then the fused mass will eat into the body without attacking the particles of quartz, which thus come to the surface, causing the roughness of the same. This is practically true of all over-burnt glazes. A striking illustration of the relation between body and glaze is met with in the manufacture of white ware and porcelain. It is found that a glaze which has combined firmly with the body, without cracking, when burned at a high heat and for a long period, will show crazing if the heat is somewhat lower or the time of burning has been shortened. This is obviously due to the absorption of silica from the body. During the shorter burn the glaze cannot obtain its quota of silica, and hence the phenomenon of crazing appears. The thicker the layer of glaze, the greater will be the tendency to craze. Thinness of the glaze-coating, intensity of fire and time of burning are three factors governing the dissolving action of glazes upon the body, outside of chemical composition. All glazes having a claim to durability must be firmly united with the surface. In underglaze coloring the chemical constitution of the glaze, whether acid, neutral or basic, is of great importance. A strongly acid glaze, for instance, would exert a solv-



REAR VIEW HEILMAN BROS. BRICK AND TILE WORKS, Tiffin, Ohio.

with the aid of these ingredients, which melts at the lowest possible temperature, corresponds in composition to cone No. 4, which is in itself a glaze. It is represented by the formula:  $R_2O, .5 Al_2O_3, 4 SiO_2$ , and is composed of 83.5 parts (by weight) of feldspar, 35 of whiting, 26 of kaolin and 54 of flint. With this composition as a basis, a series of durable white and colored glazes can be obtained. By raising the contents of silica and alumina, we can obtain glazes of any desired fusibility above cone No. 5, so that finally we arrive at the hard fire porcelain glazes, which are finished at about cone 15, this being the practical limit for glazes.

Having considered the most important types of glazes, we may discuss an important subject in glazing—the chemical action of the glaze upon the surface of the body. We have already seen that such an action takes place. A glaze, on being heated, gradually changes its composition, owing to the corroding action it exerts upon the body. Some ingredients are being continually taken up as soon as fusion has commenced. And that the addition of these particles is not without influence upon the properties of the glaze is evident. The intensity with which the body is attacked depends upon several factors. First, of course, comes the temperature and time of burning. The more intense the firing and the longer it is continued, the stronger will be the dissolving process which takes place. Next comes the chemical composition of the glaze. A neutral glaze will show the least corroding power, a basic one the greatest. An acid glaze, though more active than the neutral, has a far weaker dissolving action than the basic. Finally, glazes high in lead and alkali silicates will attack the body more energet-

ically than such low in those silicates. Body particles thus dissolved by the glaze are diffused throughout the melted mass. For instance, if the surface of the ware is coated with a color, say a cobalt blue, the blue will be found to be spread through the glaze covering it. If the color, though attacked, is not uniformly divided, the glaze will have a tendency to crack off. In low-fusing glazes it often happens that the body particles which are taken up are not diffused equally throughout the mass, and as a result the glaze will not infrequently crack off. Roughness of the glaze surface is usually due to the intense action between the glass and the body, especially if the latter is high in quartz and the glaze basic and forming a thin layer, as then the fused mass will eat into the body without attacking the particles of quartz, which thus come to the surface, causing the roughness of the same. This is practically true of all over-burnt glazes. A striking illustration of the relation between body and glaze is met with in the manufacture of white ware and porcelain. It is found that a glaze which has combined firmly with the body, without cracking, when burned at a high heat and for a long period, will show crazing if the heat is somewhat lower or the time of burning has been shortened. This is obviously due to the absorption of silica from the body. During the shorter burn the glaze cannot obtain its quota of silica, and hence the phenomenon of crazing appears. The thicker the layer of glaze, the greater will be the tendency to craze. Thinness of the glaze-coating, intensity of fire and time of burning are three factors governing the dissolving action of glazes upon the body, outside of chemical composition. All glazes having a claim to durability must be firmly united with the surface. In underglaze coloring the chemical constitution of the glaze, whether acid, neutral or basic, is of great importance. A strongly acid glaze, for instance, would exert a solv-

ent action upon the basic color, which would result in the flowing and spreading of the lines. In this case a neutral glaze would have to be used.

AMERICUS.

Written for the CLAY-WORKER.

#### A BUCKEYE BRICK AND TILE PLANT.

OHIO ENTERPRISE generally averages up with the best the world over, and Buckeye brick plants are no exception to the rule. With an abundance of good clay and plenty of cheap fuel, there is every reason why this should be the case—for Ohioans are found at the front in all things, industrial as well as political. Happening at Tiffin recently, a town of 15,000 people, who for intelligence and enterprise are the peers of any similar community under the sun, I took advantage of the opportunity to visit the brick and tile works of Heilman Bros. I expected to see a nice plant, and was not disappointed. They are fortunate in having natural gas with which to burn their ware, and that makes it much easier to keep a tidy yard. Their plant has been in operation for a decade or more, and they still have clay enough to keep them going for years to come. There are twenty acres, averaging ten feet in depth, and it can be worked from top to bottom without waste. They believe in letting nature do the tempering, so plow the field in the fall, and



the thawing and freezing through the winter puts it in excellent condition. Jack Frost is the best pugger, they think.

They now have enough clay dug for at least three million brick, and it works fine and easy. It is hauled in carts and dumped into a roll crusher placed above the machine—a horizontal soft clay machine made by the Tiffin Agricultural Works. They make on an average 30,000 a day, and dry by the rack and pallet system. The brick are burned with natural gas in ordinary up-draft kilns, of which they have five with a capacity of 450,000 each.

They also make goodly quantities of hollow brick and drain tile, using for this an Ohio machine from the shops of E. M. Freese & Co., Galion, O. The tile are burned in round down-draft kilns, of which they have three, each with a capacity of 75,000 to 80,000 tile. A 150-horse-power engine furnishes ample power for the entire plant.

They have excellent railroad facilities, a siding of the B. & O. running past the kiln sheds. The ground level of the kiln is some four feet above the tracks, making it easy to load from kiln to cars. Fully three-fourths of their output is shipped by rail, the average price for common building brick being \$5 per thousand. The demand is up to their capacity, so they have no reason to complain; on the contrary, they are well satisfied with their trade and prospects. They give employment to nearly a half hundred hands, and are justly considered among the important industrial enterprises of a thrifty city. Like most Buckeyes, they are hospitable, and are always pleased to show visiting clayworkers through their works. A. BUCKEYE.

#### TERRA COTTA IN ARCHITECTURE \*



IF ALL THE BUILDING materials of the present day, there is none that is so capable of such artistic and architectural treatment, and none that possibly is so little understood by and amongst the majority of the people, and yet so destined, as I believe it is, to reach far greater developments than those already achieved, than terra cotta; and it is my desire in this paper to consider, for the most part, the use of terra cotta in architecture and building.

This nineteenth century, and more especially the latter part of it, has been one that has been fraught with more inventions and greater progress in all matters pertaining to manufactures, science and art than possibly any preceding period of this world's history. The strides that have been made have been both rapid and great, and architecture and building and building material of all classes have taken up their line in the march of progress and have kept pace in their turn with every other improvement that has been patent to this age, and amongst these no material has come more to the front and shown greater possibilities, both in the way of development and application, than "burnt earth" in the shape of terra cotta and brick; but before I would speak directly on terra cotta as a building material, as especially applicable to modern construction, I would like to say a few words in regard to terra cotta generally.

Terra cotta is, as most of us know, but a generic term, and literally speaking means nothing more nor less than "baked" or "burnt earth," and has been known for very many centuries, and the earliest histories of many of the most ancient nations of the world bear record to its use in many various ways, and we owe to this material, too, and its wonderful preservative properties, what knowledge we now possess of the history of the ways and means, manners and customs of many ancient nations, such as Assyria, Nineveh, Babylon, etc., and through this, which may seem to us somewhat remarkable agency,

such history has been maintained and handed down to posterity. There has been very much learned and written of late years in relation to this matter, and the subject is one of vast interest, but neither the time nor the character of this paper will permit us to do more than just recognize and glance at such facts, and whilst doing this it would be well for us to remember that the terra cotta of bygone ages was always of a character peculiar and of course suitable to the ages and countries in which it was made and used; and thus we are able to trace and follow up the development of this material to the present day, where we see a production and an application far ahead in every respect of anything ever known previously, and (may I say it?) far ahead of anything ever anticipated even at as short a time back as my own early days in the manufacture of terra cotta, over thirty-five years ago—a material peculiar and suitable to the requirements of the present day.

I believe the earliest authentic record that we have of the manufacture of clay goods was of "brick," where we have it in the language of the inspired writer who says, "Go to, let us make brick and burn them thoroughly, and they had brick for stone." This record (though it is seldom regarded as such) is very significant, in this wise, that it most clearly shows that the people even of those days were fully alive to the value of thorough burning as a property or agency for rendering durable this work of their hands, for they said let us burn them thoroughly, also that there was here a substitute and possibly a better one in many respects for stone—easier to handle and quicker to construct, for "they had brick for stone." This was about 4,100 years ago. I would not say for one moment that the value or use of clay in some measure or another was not known previous to this, because I think very possibly it was.

As to the origin of the use of clay or terra cotta as a material of service, we know nothing, any more than we know of the origin of building itself, nor can we imagine what prompted the idea in man to take clay and make something of it and then harden it by fire; but Mr. Jacquemart, in his *History of the Ceramic Art*, translated into English by Mrs. Bury Palliser in 1873, speaks thus as to the origin of terra cotta or burnt earth: "On the day when man, walking upon the clayey soil, softened by inundations or rain, first observed that the earth retained the print of his footsteps, the plastic art was discovered, and when lighting a fire to warm his limbs or to cook his food, he remarked that the surface of the hearth changed its nature and its color, that the reddened clay became sonorous, impervious and hardened in its new shape, the art was revealed to him of making vessels fit to contain liquids." This is poetic in its rendering, but it is nevertheless very plausible. In speaking of clay itself as a property, this same author says: "Clay, from its plastic nature, lends itself to the idea of modeling, and gives scope alike to the liveliest flights of imagination and the most persevering efforts of industry. Abundant in its variety, easily procured, and consequently devoid of intrinsic worth, it derives its value solely from the elegance of form imposed upon it by the potter, or from the richness of decoration given to it by the artist." And how very distinctly does the truth of this dawn upon us as we see all around us and contemplate still further the application of clay in the form of terra cotta as a building property. Hester Poole, a few years ago, wrote thus: "Old dead mineral debris, the dust or mud under our feet, is mixed, ground, moistened, carved and baked until by the informing power of man, shaping a form which first existed within his own imagination, the ideal becoming the real, it is forced therefore to express his science, his art, his sense of fitness, of harmony and refinement, until it is an embodiment of the wisdom of the century." And how, indeed, is this reflected in our buildings, for are not buildings the monuments of a nation's enterprise, science, art and intelligence, and can we not always gauge the condition, in point of enterprise, intellect, refinement and civilization of a nation, city or town by the character of its buildings? Architecture has always played an important part in marking the era of a people or nation, and of course in connection with architecture must necessarily come the application and use of materials entertained in that architecture; thus, in ancient Egypt we find imposing buildings of grand architecture and large proportions, involving enormous blocks of stone; also monuments of monolithic creation, telling us of the character and condition and customs of that people; whilst in this country of to-day we have mammoth buildings, reaching high into the air, having for the most part a peculiar construction—peculiar and foreign to anything done by previous generations, but nevertheless a successful one, in the combination of iron, stone and clay, and these will in their turn give an idea to future generations what kind of a people we were in these days that had constructed such buildings and had wrought out such architecture.

I suppose the first real application of terra cotta in architecture of any extent, both as to quality as well as quantity, was

A paper read before the Cincinnati Chapter of Architects, March 29, 1898, by Joseph Joiner, Manager for the Indianapolis Terra Cotta Company.



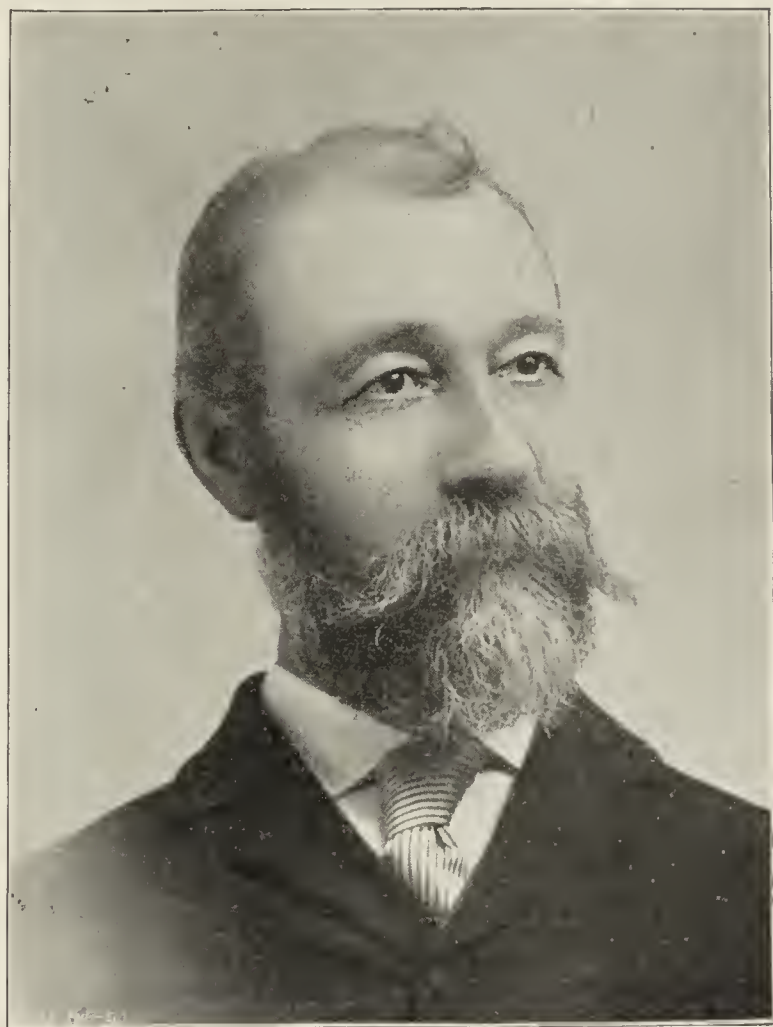
in northern Italy in the thirteenth, fourteenth and fifteenth centuries, many examples of which have been beautifully illustrated by Lewis Gruner in his work entitled "Terra Cotta Architecture of Northern Italy," and which shows how well the people in those days understood the successful application and combination of terra cotta with brickwork. True, the terra cotta was not made in large blocks, and had no pretention to an imitation of stone, as the terra cotta of to-day, and to this I attribute, taking into consideration the knowledge of the material at that time, the pleasing effect of their buildings. The late Sir George Gilbert Scott, one of London's celebrated architects, in his work on "Gothic Architecture, Secular and Domestic," says: "Terra cotta seems the natural accompaniment of brick, but it should not be used as an artificial stone. It is the highest development of brick, and should be used as such." This was written some thirty years ago. It is not within the scope of this paper, on account of time, to trace the development of terra cotta in its application to building, but I would like to call your attention to such buildings in England and this country which I think brought out the great possibilities of terra cotta, and which most certainly gave the initiative for what has since been so fully developed. In the latter part of the last century and the early part of this century two ladies were engaged in the manufacture of terra cotta in London, England (the Misses Coade, afterwards Coade & Seeley), and this factory was really the parent of others that followed; but they only made what we would now call "stock patterns." Their work was good and durable, and I have seen some of their terminal vases in the city of Dublin, of rich ornamentation, and apparently as sharp and as perfect as when made, and bearing the stamp in the clay, "Coade, 1796," and from this time terra cotta continued to be manufactured and used as a building material in England and in some of the other countries of Europe, but only in a limited measure, and it was not until the early sixties that the possibilities of terra cotta in a large degree as a truly constructional material were made evident, and in that decade many large and important buildings, having terra cotta for stone, were erected in London, the three most important being the Kensington Museum, the Albert Hall, and the Dulwich College, and we might say, indeed, that these three buildings were the school of much experience in architectural use of terra cotta, both for architect, manufacturer and builder.

It is not my intention to speak of these pioneer manufacturers, for they have passed away; but I would like to speak of the determined efforts of the designer of Dulwich College, Charles Barry, the architect, and the persistence and patience which he manifested in going through this school of experience; and we must remember that at this time this material was very little understood by either architect or manufacturer. Mr. Barry found in terra cotta not only a material that had great possibilities, and one that could be economically used as against stone, but also one in which artistic developments found no limit. Thus he was constantly at the factory, staying for two or three days at a time, making many valuable suggestions, and, to a certain extent, superintending the modeling of his own work; and so much was he interested in this revival of terra cotta that he read a paper on the subject before the Royal Institute of British Architects in London on June 22, 1868, and which produced much comment and enthusiasm. Mr. Page, an eminent engineer of that time, remarking that "he looked upon the work of Dulwich College as a revival of the art of building in terra cotta, and as it partook of the nature of stone, it might be introduced in a considerable measure in all buildings." I believe that a paper on terra cotta was also read as far back as 1850, but I have no particulars of this within my reach, and I find that John H. Sturgis, the architect, read a paper entitled "Terra Cotta and Its Uses" before the convention of American architects at their meeting, November 15, 1871, at the Massachusetts Institute of Technology, at Boston.

In 1873 the terra cotta was made in Stamford, England, for the first portion of the Fine Art Museum at Boston, Mass., from the designs of Sturgis & Brigham, architects, and was packed in earthenware crates and shipped to this country, and in an English newspaper article relating to this work it says: "The Americans are now building in Boston one of the largest and most magnificent structures ever dedicated to the arts," and speaking of the terra cotta itself it says: "It is frost and fire-proof, and will be an enduring monument of the artistic industry of Stamford for ages. The name of Stamford, burnt on these blocks of terra cotta, may turn up some day three thousand years hence like the incised bricks and terra cottas of Babylon and Greece."

A very interesting article published in the American Architect, June, 1885, states that "Among the first buildings in which terra cotta was used in this country were the Cooper Institute Building, New York City, and the State House at Springfield, Ill., no further effort being made to bring it into use until it was resorted to for ornamentation in the construction of the Museum of Fine Arts in Boston, and then it was imported from

England." Although terra cotta was made in Chicago and in other places in this country prior to this, and the great fire of Chicago served to open the way for the use of terra cotta as a material that would not be affected by fire, yet there seemed to be no very great development until this work for the Boston Museum was imported, and I presume that this fact created an impetus among American manufacturers, for we find soon after this terra cotta being manufactured extensively in many places, large buildings being elaborated with it; and since that time there has been a continued improvement in the manufacture, on the one hand, and an increased knowledge as to its better use and application, on the other hand, until we see round about us in all directions evidences of the combination of the skill of the architect and manufacturer, the one in the production of the terra cotta, and the other in the design and application, and the absence of terra cotta in buildings in any of our towns that have aspired to a size beyond that of a hamlet is now an exceptional property. Mr. R. N. Snell says: "Terra cotta is to-day the most available material used in every assemblage of architectural decoration, and has virtually taken the place of stone in this respect, and is now used in the completion of most of the larger buildings erected, and when proper care is used in construction, it will endure and be a thing of beauty for ages." And I might add that no cities in the old world can show anything in the way of commercial structures in terra



JOSEPH JOINER, Indianapolis, Ind.

cotta to compare with those in this country, and whatever may be said of the style of architecture, whether it be American or otherwise, the enterprise which builds such structures is most certainly American.

#### —Manufacture.—

It may be interesting to some of you to have a brief outline of the manufacture of terra cotta, for whilst the range of its application in architecture is immense, yet there are some limitations, and these restrictions arise principally from the processes of its preparation, and it is well that architects should become acquainted with the extent of these limitations. It is not because a clay can be used in making brick that it necessarily can be used in making terra cotta; in fact, the clays for making terra cotta should be very carefully selected, and oftentimes more than one clay has to be used, as some clays cannot be used alone, and the nature and combination of these clays, with the other admixtures necessary for the making up of a body that will successfully stand the heat from burning in the kiln and that will undergo the shrinkage from this process with the least possible distortion or cracking, are matters which the expert alone can determine, and that upon results, either experimental or otherwise. This material is then carefully ground and mixed with water and pugged, that is, kneaded together through mills especially constructed for that purpose, so



that the clay is brought into a homogeneous condition and plastic state. The drawings of the various outlines, when received from the architect, have to be enlarged to allow for the shrinkage of the clay during the process of manufacture, which is generally about one inch to every foot, and all the work has to be fully set out on paper in order to define every block in its special size and shape that may be required, to prevent any error in this respect; thus it will be seen that there is quite an amount of drawing to be done, and these last-named drawings ultimately serve as setting-sketches for the builder. Models for the various portions of the work are then made in plaster from these drawings and the artistic modeling done, and plaster molds are taken from these models, into which the clay is pressed. These clay blocks or pieces are made hollow, the thickness being from one inch to one and one-half inches, according to the size of the piece, and reinforced at intervals with braces or partitions, and which are necessary for holding up the pieces in proper shape and position when removed from the molds. The work is then finished, undercut and relieved, and placed into dry rooms, heated to a temperature of about 100 degrees, to dry for the kiln, and during this operation, which may last a week, possibly, the ware has to be carefully watched and handled, as in this first process of shrinkage a little warping and cracking sometimes takes place. When the work is sufficiently dry it is removed from the dry rooms to receive a coat of slip, administered by a steam spray. This coating of slip or washed clay serves a twofold purpose: First, that it closes up the surface pores of the terra cotta body itself and puts upon it a close, tight, semi-vitreous, water and dirt-resisting surface; second, that in it the manufacturer is able to produce the many and varied shades of color that have been so successfully accomplished of late years, and which could not be done in such measure in the body itself; and this coating of slip has to be so compounded and put on that there may be no possibility of a peeling off or of a non-adhesion, either during or after the process of burning. The work is now ready for the kiln, into which it is carefully placed, being set or placed upon fire clay slabs, resting upon fire clay supports, and thus packed up until the kiln is full. Terra cotta kilns are constructed of various sizes, and generally upon what is called the muffle principle—that is, the flame does not come in contact with the ware, but the ware is burnt, or rather baked, by radiated heat. I cannot say positively what the extent of this heat is, some clays requiring more and some less, but possibly from 1,500 to 2,000 degrees. This is where the second and last process of shrinkage takes place, and where the clay is solidified and hardened and made weather-proof, and some little warping and cracking is liable to take place here, but which is now, by improvements in the manufacture, reduced to a minimum. The work of setting, burning and drawing a kiln of ordinary size takes two weeks or a little more. The work, when burned, is removed from the kiln, and is then laid down on a good, true floor, in accordance with the drawings mentioned before, and fitted, and then marked in order of setting, the drawings transmitted to the builder being marked in like manner to facilitate the setting of the work in position on the building. Thus the manufacture is complete, and it will be seen by this brief description that it takes some little time to pass a section of work through from the beginning to the end of the manufacture, and in these days of hurry and rush it is deeply important that architects should make their details for the terra cotta at the very first outset, and thus give the manufacturer all the time that is necessary for getting out the work, for undue speed generally tends to imperfections.

(To be continued.)

### HOW TO MAKE A FORTUNE.

The following are extracts from a letter written by Henry Ward Beecher to his son:

"You must not go into debt. Avoid debt as you would the devil. Make it a fundamental rule: No debt—cash or nothing."

"Make few promises. Religiously observe the smallest. A man who means to keep his promises can't afford to make many."

"Be scrupulously careful in all statements. Accuracy and perfect frankness, no guesswork. Either nothing or accurate truth."

"Make yourself necessary to those who employ you by industry, fidelity and scrupulous integrity. Selfishness is fatal."

"Hold yourself responsible for a higher standard than anybody else expects of you. Demand more of yourself than anybody expects of you. Keep your own standard high. Never excuse yourself to yourself. Never pity yourself. Be a hard master to yourself, but lenient to everybody else."

"Concentrate your force on your own business; do not turn off. Be constant, steadfast, persevering."

"Do not speculate or gamble. Steady, patient industry is both the surest and the safest way. Greediness and haste are two devils that destroy thousands every year."

"The art of making one's fortune is to spend nothing. In this country any intelligent young man may become rich if he stops all leaks and is not in a hurry. Do not make haste; be patient."

Written for the CLAY-WORKER.

### SPRING MEETING OF THE NATIONAL STOVE LINING MANUFACTURERS' ASSOCIATION.



THE FIRE BRICK stove lining manufacturers held their usual spring meeting at the Broadway Central Hotel, New York City, on Wednesday, 20th, and Thursday, 21st of April. Owing to the unsettled conditions which prevail in all lines of business at this time, there were not so many members present as is generally the case, although most of the factories were represented. The sessions were of considerable interest, and the reports of trade in the various sections were, as a rule, favorable, with fair prices well sustained. Among those present were Ben F. Fox, of Reading, Pa., President; John Williams, of Taunton, Mass., Treasurer; B. C. Pierce, of Taunton, Mass., Secretary; ex-President Horton, of Peekskill, N. Y.; ex-President McLeod, of Troy, N. Y.; F. S. Brown, Royersford, Pa.; Gideon C. Francis, Dighton, Mass.; H. A. Perkins, Brooklyn, N. Y.; Arthur Lincoln, Union Stove Lining Company, Taunton, Mass.; Bradford French, French & Winslow, Taunton, Mass.; Charles A. Bloomfield, Metuchen, N. J. Joseph Williams, who has for a long time been suffering from severe prostration, was also present, and his friends were glad to notice a visible improvement in his appearance and to learn that there is good reason for the hope that he will shortly be restored to health and able to resume his work in the business of Williams Brothers, Taunton, Mass.

After the morning session on Wednesday, those present partook of a social dinner served in one of the private dining rooms by host Tillie Haynes, with his usual generous and bountiful style when he is catering for the brickmakers.

In the evening the members were entertained at the Broadway Theater by invitation. They were introduced to the joys and tribulations of "A Wedding Day," as presented by Lillian Russell and Della Fox, assisted by Jefferson De Angelis. Brickmakers like a good thing, and enjoy it when they see it.

On Thursday the closing session was held, and, recognizing the critical events of the present moments in the history of our nation, the stove lining makers put upon record on their minutes a resolution endorsing the action taken by President McKinley in sending an ultimatum to Spain regarding the existing condition in Cuba.

It was intended to present at this meeting some notes of interest to fire clay workers suggested by the essay delivered at Pittsburg by Prof. Orton, Jr., but it was decided to have them reported in this report, so that all those who were not present might have the benefit if there was any in them.

The fire clay workers who were present at the Convention of the N. B. M. A., held in Pittsburg in February, and heard that very instructive essay delivered by Prof. Edward Orton, Jr., upon "The Refractory Qualities of Clay," felt that those who were absent were losing something of value, and one friend of the stove lining and fire brick men determined that some points therein presented which might prove useful and profitable to them should be offered at the spring meeting of the Stove Lining Association.

Note I.—The essence or useful quality of clay is described by scientists as kaolinite. This material is plastic in its nature, and is a simple combination of silica and alumina, which has been named by chemists silicate of alumina. Pure clay, therefore, is kaolinite, or silicate of alumina. This is a very refractory material, and can only be fused by special furnaces and at temperatures far above any that are used in manufactures of any kind.

Note II.—Pure clay is never found outside of the laboratory, because in all of the natural deposits of clay it is always found mixed with other materials which affect its refractory character. These deleterious materials are five in number, and are hurtful in the order named: Feldspar, mica, carbonate of lime,



carbonate of magnesia, and the oxides of iron. All of these have a tendency to form slag by fluxing with any free silica or sand which may be contained in the clay mixture, and the fluxing quality is determined by the amount of alkalis which are always more or less present in clay. Potash and soda are the most active fluxes, and when either or more of these five materials are found in the clay together with any considerable amount of potash or soda, it can hardly be classed among fire clays.

Note III.—The manufacturer of fire brick, in order to know where to sell his brick so as to insure success, must not only know what his clay is composed of, but he must also learn what elements are produced or set free by the processes being produced in the furnaces for which his brick are to be offered. The amount of heat is by no means the test of quality in all cases, and a temperature which in one instance may reduce his bricks to slag may under other conditions decide his bricks to be of the very best quality. Everything depends upon the combinations which under extreme heats will be produced from the elements which are in contact during the operation of the furnace, including not only the construction material of the furnace, but also the contents and fuel of the furnace.

Note IV.—These facts, therefore, are important in the question of, How shall you control the shrinkage of your clay? For many purposes it is safe to use silica or fire sand; stove linings used with certain fuels, for instance. But in many cases it would be dangerous to use sand. Your clay may have more than its best proportion of silica; 45 per cent. is the standard in pure clay, and any excess of this amount is equal to an admixture of sand; hence the danger of using sand for high-grade furnace brick. The very best form of grit which you can use for the purpose of controlling the shrinkage of your clay is the clay itself burned and granulated (avoid dirt). This adds nothing to the chemical constituents of the clay, and it may possibly eliminate some injurious element. By the use of grit made from your own fire clay you are therefore assured that your mixture is in every way equal to the fire clay you have. All that relates to the mixing and burning and use of your material must be of importance to you, especially if you are desirous of extending the use of your product. Therefore, I trust that you will excuse me for this attempt to help you. If I can induce you to read the essay by Edward Orton, which you can find on pages 110 to 113 of the Clay-Worker for February, I shall be well paid, and I am sure you will be benefited.

JAMES TAYLOR.

Friend Orton: I know you will excuse my attempt to help my fellow clayworkers. Even if I have blundered, your generosity will, I am sure, charge all mistakes to my head and let my heart go free.

J. T.

#### THE ART SCHOOL AT TRENTON, N. J.

TRENTON, THE GREAT CLAY CENTER, is at length equipped with a school of applied science and art. The project has been under consideration, more or less definitely, for some years, but just twelve months ago his Honor the Mayor formed a large committee with the view of bringing matters to a head. The Commissioners of Public Instruction consented to take charge of the school, and operations were begun early in April of this year.

The direction of the work has been confided to Charles F. Binns, who has had an experience of twenty-five years with the Royal Worcester Porcelain Company, of England, and who was approached by the Trenton committee while he was on a visit to this country. The engagement of Mr. Binns naturally attracted the attention of the Trenton potters, and among them are to be found some of the warmest supporters of the scheme.

The scope of the work, as outlined by the director, is, briefly, education in pure art and pure science as an indispensable preliminary to technical application. At present, owing to the absence of accommodation for scientific teaching, the classes are mainly confined to drawing. A good number of students are in regular attendance, and already good progress is being made. Several young men are in training as modelers, and a number of pottery decorators are endeavoring to improve their powers by means of the art classes.

Though it has not yet been possible to open a chemical laboratory, Mr. Binns has made a beginning upon the more immediately practical side by undertaking a series of lectures on "The Theory and Practice of Glaze Composition." These lectures are exciting great interest, and are being attended by numbers of the most practical men in the city.

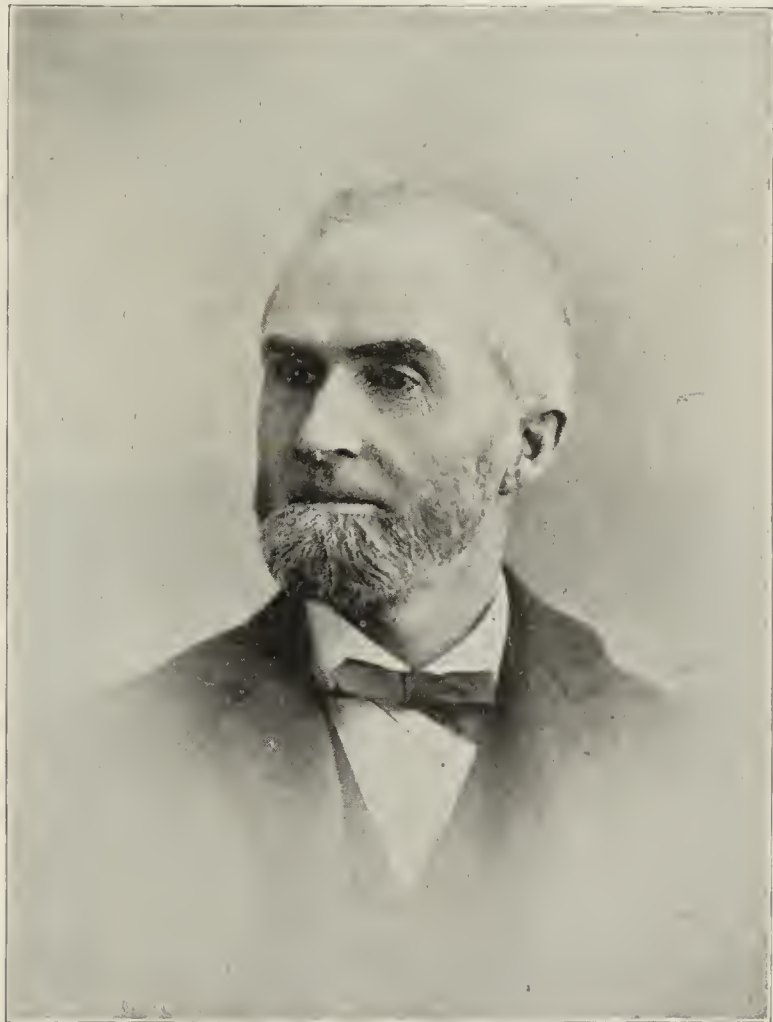
In a place like Trenton, where there are not only a number

of potteries, but many other manufacturing industries, there must be a wide scope for such an institution as this. Almost every manufacturer is in need of artistic or scientific workmen in some form or other, and the building up of the competitive trade of the country will largely depend in the future upon such native supplies as can be produced upon our own soil. The time has gone by when we can be satisfied with French, German or English artists and designers, and the organization of any means for the development of American talent is worthy of all support. The school is supported partly by the City Board of Education, partly by public subscription, and partly by the State.

#### OBITUARY.

##### F. D. CUMMER, of Cleveland, Struck and Killed by a Railway Train at Cincinnati, Ohio.

MR. FRANKLIN D. CUMMER, President of the F. D. Cumber & Son Co., of Cleveland, Ohio, the well-known inventor of the artificial dryer bearing his name, was accidentally killed Wednesday afternoon, May 4th. While crossing the Cincinnati, Hamilton & Dayton tracks at Evans street



F. D. CUMMER, Cleveland, Ohio.

he was struck by a passing train, and died in a few moments. Mr. Cumber was recognized throughout the United States and Europe as an authority on the science of mechanically evaporating or drying clays, grains, garbage, etc. He is the inventor of the well-known Cumber dryer, which is now in use in many places, both at home and abroad. In the capacity of expert engineer Mr. Cumber traveled extensively throughout Europe, Asia and Australia. For several years he had spent his summers abroad, superintending the erection and operation of his dryers. He was fifty-five years of age, and a native of Canada, but had been a resident of Cleveland for many years. Besides a wife, Mr. Cumber leaves three sons, who were associated with him in business, and two daughters.

Mr. Cumber, though a very quiet and undemonstrative man, was exceptionally genial and kindly at heart, and his untimely death will be mourned by a wide circle of friends and acquaintances. The business of the firm of which he was the head will be continued under the direction of his sons, who have been active in its management for several years.

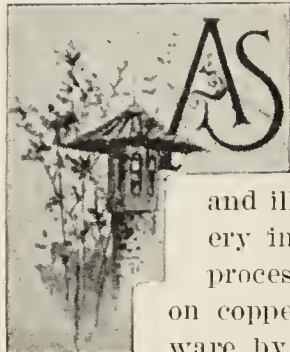


Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 2.

Printed Designs Relating to America, by Old English Potters.

—Staffordshire Pottery.—



HAS ALREADY been shown in a previous paper, one of the most interesting phases of the art of old English potters was the printing of American scenery, views of prominent buildings and places, and illustrations of historical events on the crockery intended for sale in the United States. The process consisted in the engraving of the designs on copper and the transference of the same to the ware by means of wet impressions made on tissue paper with prepared colors mixed with oil. Early in

the present century the Staffordshire potters commenced to print these designs in dark blue, and continued to use this color almost exclusively on cheap table and toilet wares until about 1830. This method of decorating was employed in many of the larger potteries of the Staffordshire district, and each potter usually had his own characteristic border designs, by means of which it is generally possible to distinguish the work of the various manufacturers, except in those cases where no marks were placed upon the ware to furnish a suggestion as to its probable origin.

The question naturally arises, why was this particular class of household crockery of that period decorated in this manner? There were two reasons why the deep blue color was used in such profusion. In the first place the ware, which was made to sell at a moderate price—from six pence to a shilling for a



ENOCH WOOD.

single plate—was necessarily of an inferior grade, frequently blistered, warped or otherwise imperfect in body and always showing the glaze marks of the cockspurs used to separate the pieces in the kiln. By entirely covering the upper or outer surface with dark blue, the blemishes were concealed. The color,

moreover, was attractive and caught the fancy of the public, and when used in designs of local or historic interest the patriotism of the people was appealed to and the sale of the ware was assured.



MARINE HOSPITAL, Louisville, Ky.

Potters of the present day tell us that the production of the beautiful, rich coloring of these old plates is a lost art. Whether this assertion is true or not, we know that this peculiar tone of color is not found in modern wares. Imitations have been frequently attempted, but so far as we know without success.

One of the marked peculiarities of these old plates, frequently observed by collectors, is the presence of three small, rough spots in the glaze at about equi-distant points around the margin on the colored side—blemishes formed by the “cockspurs” or “triangles” which were used to separate the pieces in the sagger or fireclay case in which the plates were placed in the kiln to be fired. These cockspurs consist of small clay objects, resembling miniature caltrops, with four prongs, on three of which they rested, while the fourth, rising perpendicularly, supported the upper plate on its point. As the plates were placed in the kiln face downwards, the single points left their marks on the face, while the three lower arms, arranged in a triangle, left their marks on the bottom of the plates, as will be seen on examination. These apparent imperfections will, therefore, be found, with greater or less distinctness, on every piece of flatware, such as plates, platters, saucers, and shallow vegetable dishes, which were produced at that period.

Of late years, collectors of the dark-blue Anglo-American crockery have rapidly increased in number, so that to-day there are hundreds of enthusiastic seekers for “American views” or “historical china,” in all parts of the land. No complete list of these designs has yet been prepared, though the need of such a handbook has long been felt.

The compiler of the following lists can scarcely hope to escape some of the errors which have crept into such partial lists as have been previously published, since it is hardly possible for one person to examine all the views which are contained in the various collections, public and private, which are scattered through this country and England. Every possible effort has been made to secure accurate descriptions and precise inscriptions of the designs, but in many cases it has been found to be necessary to use the data procured at second hand. The writer would consider it a favor if his attention should be called to any omissions or errors which may be noticed during the publication of these papers, to the end that a perfect and complete list of such designs may be ultimately produced.

—Enoch Wood.—

One of the earliest of the Staffordshire potters to manufacture dark-blue printed ware for American consumption was



Enoch Wood, sometimes called the Father of English Pottery. Although he was one of the most progressive and prominent craftsmen among his contemporaries, we find but scant allusion to his career in ceramic literature. Mr. Llewellynn Jewitt, in his "Ceramic Art of Great Britain," furnishes but meager information on this point, but states that Wood was a good practical potter and modeler and that in 1781 he executed a bust of John Wesley, who was frequently a visitor at the former's house. This apparent neglect of one of England's most active potters may be explained by the fact that he turned his attention largely to the foreign trade, for which reason the evidences of his enterprise are more abundant in this country than in his own. Certain it is that no other English potter of his generation paid so much attention to the American market, as is proved by the great variety of engraved designs which have been found here bearing his name and mark. Indeed, there is strong reason for believing that much of the unmarked dark-blue ware bearing American devices came also from his establishment. These, however, cannot be positively attributed to him, though the peculiarities of the engraving would point to such an origin. Some of the characteristic old Toby jugs and patriotic pitchers and plates bearing portraits of our naval

"Washington; born 1732, died 1799." Enoch Wood, 1818.  
Statuette of Washington.  
Statuette of Franklin.

DESIGNS BY ENOCH WOOD & SONS.

—Designs in Dark Blue (various borders.)—

1. Border, Scroll Medallions containing Inscriptions.



LA GRANGE.

Landing of the Pilgrims (made in 1820 to commemorate the two-hundredth anniversary of the landing at Plymouth.)

2. Border, Sea Shells.

Type a.—Irregular center, like entrance to grotto, surrounded by marine shells and other objects. Name of view usually on face of design.

Cadmus (ship in which Lafayette came to America in 1824).

Chief Justice Marshall, Troy (steamboat, Troy Line).

Commodore Mac Donough's Victory.

Marine Hospital, Louisville, Ky.

Union Line (steamboat, Troy Line).

Wadsworth Tower (Connecticut).

3. Border, Sea Shells.

Type b.—Circular center, surrounded by marine shells, cockles and Echinus. Name on back.



GILPINS' MILLS.

heroes of the War of 1812, are generally believed to have been produced by Wood.

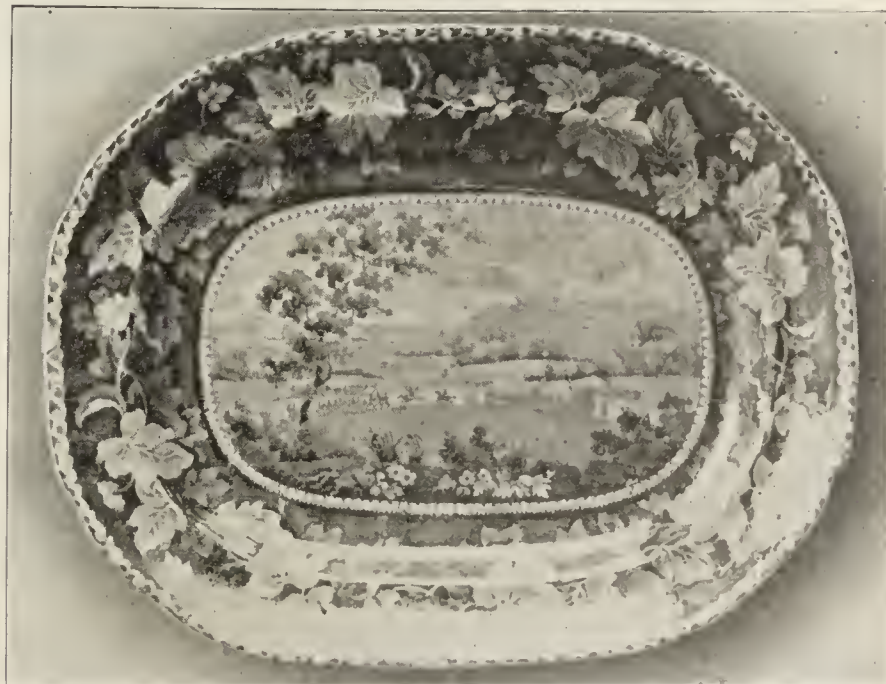
Enoch Wood, the youngest son of Ralph Wood, potter, of Burslem (who died in 1780), was born on the 31st of January, 1759, and died on the 17th of August, 1840, these dates being taken from his tombstone in St. John's churchyard, Burslem. He was chief constable (equivalent to mayor in this country) of his native town in 1832 and again in 1835, and was returning officer for the borough of Stoke-on-Trent in 1834.

In the year 1783 he commenced business for himself and in 1790 took James Caldwell into partnership, the title of the firm being Wood & Caldwell. In 1792 the style was changed to Enoch Wood & Co., and in 1818 to Enoch Wood & Sons. The original pottery is not now standing, having been partly torn down some years ago, but a portion of the buildings were turned into shops which still remain.

The portrait of Enoch Wood here shown was taken from a large steel engraving owned by Mr. Thomas F. Wood, a kinsman, whose works, the Trent Pottery, are in the same town. No direct descendants of Enoch Wood are now living, so far as is known.

LIST OF CERAMIC DESIGNS, RELATING TO AMERICA,  
PRODUCED BY ENOCH WOOD.

General George Washington. A bust in basalt, labeled



BATTLE OF BUNKER HILL. By A. Stevenson.

Albany, City of. State of New York.

Baltimore & Ohio Railroad.

Baltimore & Ohio Railroad (inclined plane).

Capitol at Washington.



Castle Garden Battery, New York.  
 Catskill House.  
 Catskills, In the.  
 Catskill Mountains (palisades, river and steamboat).  
 Fort Gansevoort, N. Y.  
 Franklin's Tomb (sometimes improperly called Lafayette at Franklin's Tomb).  
 Gilpin's Mills on the Brandywine Creek.  
 Highlands Hudson River.  
 Highlands at West Point, Hudson River.  
 Lake George, State of New York.  
 Mount Vernon, seat of the late Gen. George Washington.  
 Niagara Falls from the American Side.  
 Pine Orchard House, Catskills.  
 Ship of the Line in the Downs (vessel with American flag).  
 Steamship flying American Flag.  
 Table Rock, Niagara.  
 Transylvania University, Lexington (Ky.)  
 Trenton Falls, View of.  
 Washington's Tomb (sometimes improperly called Jefferson at Washington's Tomb).

—French Views by Enoch Wood & Sons.—

4. Border, Iris, Hollyhock and Grapes.  
 La Grange, the Residence of the Marquis Lafayette.  
 East View of La Grange.  
 Southwest View of La Grange.  
 Chateau Coucey.  
 Hermitage En Dauphine.  
 Chateau d'Ermenonville.  
 Moulin sur la Marne a Charenton (erroneously supposed to be on the Lafayette estate).



JAMES CLEWS.

Moulin sur la Marne a Charenton (variety—men on bank of dam).

Vue Peise en Savoie.

Unknown view, with same border (evidently French), marked on back "Peter Morton, Hartford."

The above, while not American views, are enumerated for the reason that collectors generally associate them in some way with Lafayette.

Enoch Wood & Sons produced many views of scenery of other countries—England, Canada, Italy, Africa, South America, India, etc. Views relating to England and the English colonies were made usually with the same shell border that is found on the United States designs.

—Canadian Views by Enoch Wood & Sons.—  
 (Shell Border.)

Fall of Montmorenci near Quebec.

Quebec (view of).

The Italian and classical designs in dark blue, such as Vesuvius, Tarentum, Fisherman's Island, Lago Maggiore, Agrigrentium, Oretho, Corigliano, Micata, and a host of others, possess a beautifully engraved border of flowers and cherubs. This branch of the subject we shall not review here.

Enoch Wood & Sons also executed a handsome series of Scriptural designs in dark blue, with a border composed of

Biblical emblems (which see, under the proper heading, to follow).

—Designs in Black, by Enoch Wood & Sons.—

Large pitcher, bearing printed portraits of Decatur, Perry, Hull, Jones, Brown, Bainbridge, and views of the Chesapeake



"STATES" DESIGN, No. 1, FISHERMEN, By Clews.

and Shannon, Perry's victory on Lake Erie, Naval Monument, United States Coat-of-Arms, MacDonough's victory, and the Constitution's escape from the British squadron. This piece, bearing this combination of designs, is commemorative of the war of 1812.

A series of plates, with black prints of a similar character, but unmarked, well known to collectors, are supposed to have been produced by the same firm. These will be enumerated in their proper place.

—List of Ceramic Designs, relating to America, produced by E. W. & S.—

—"Celtic China."—

5. Border, Fruits and Flowers.

At a later period Enoch Wood & Sons produced a large number of American designs in various colors—black, brown, red, purple, light blue and green.

Fairmount Water Works on the Schuylkill (Philadelphia).



DR. SYNTAX RETURNED FROM HIS TOUR.

Harvard College.

Natural Bridge, Virginia.

Pass in the Catskill Mountains.

Shipping Port on the Ohio, Kentucky.

Transylvania University, Lexington (Ky.)



## Trenton Falls.

This same border (No. 5) was used on their English views of the same period, such as "English Cities—Rochester," etc.

## STAFFORDSHIRE WARE.

—A. Stevenson. James Clews.—

A pottery was established at Cobridge, Staffordshire, England, in 1808, by Messrs. Bucknall & Stevenson, which, a few years later, was operated by Mr. A. Stevenson alone. The latter was among the first to make blue printed china decorated with American views. Some of these bear the name of W. G. Wall, Esq., who came from Dublin to New York in the year 1818. He was not the engraver of the designs, nor the importer of the ware, as has been commonly supposed, but the artist who executed the paintings from which the ceramic engravings were copied. These landscapes must have been forwarded to England soon after Mr. Wall's arrival in the United States, since the Cobridge works passed into other hands in the same year or that immediately following. Very little is known of Stevenson himself, save that he was a prominent and careful potter. In addition to his American specialties he is known to have produced a series of similar designs of noted English buildings and scenery. All of these were characterized by excellence of drawing, good coloring and accurate printing. His border designs were handsome and varied in character, those most frequently used being a well-executed wreath of grape leaves, and a design of flowers and scroll-work. The blue color was usually less intense than that of Enoch Wood's American wares, and more transparent in the lighter shadings.

LIST OF AMERICAN CERAMIC DESIGNS,  
PRODUCED BY A. STEVENSON.

—Designs in Dark Blue.—

Border, Grape Leaves, or Floral Design.

Battle of Bunker Hill.

Boston, Hospital.

Governor's Island, View of, by W. G. Wall, Esq.

Lafayette (portrait).

New York, Alms House, City of, by W. G. Wall, Esq.

New York Battery.

New York, City Hall.

New York from Brooklyn Heights, View of, by W. G. Wall, Esq.

New York from Weehawk, View of, by W. G. Wall, Esq.

Niagara (Falls on Canadian side).

Rochester, View of the Aqueduct Bridge at (with heads of Washington, Lafayette, Jefferson and Clinton).

Washington, Capitol at.

Mr. A. Stevenson was succeeded at the Cobridge works by Ralph and James Clews, as shown by the Staffordshire directory for 1818. Simeon Shaw's History of Staffordshire, published in 1829, gives J. & R. Clews, James having apparently become the senior member of the firm. In Ward's History of the Borough of Stoke-upon-Trent, the Cobridge manufactrners are referred to (1838-39) as "Wood & Brownfield (at the large works formerly Stevenson & Bucknalls, afterwards R. & J. Clews)." It thus appears that the firm of Clews retired previous to 1838, and as a matter of record James Clews came to the United States about 1836 and soon afterwards embarked in the manufacture of pottery at Troy, Indiana. This enterprise, as I have shown elsewhere ("Pottery and Porcelain of the United States"), was unsuccessful, both from a commercial and financial point, and Mr. Clews returned to England, but did not again engage in potting.

## CLEWS.

Border, Festoons containing Names of Fifteen States.

Border, festoons containing names of fifteen States.

Type a.—Five-pointed stars.

Type b.—Eight-pointed stars.

1. States. Three-story building and observatory; two fishermen.

2. States. Three-story building and one-story wing; deer on lawn.

3. States. White House, Washington; water and row boat; two figures.

4. States. University building, six wings; sheep on lawn.

5. States. Three-story flat-roof building; no figures.

6. States. Low two-story structure, probably White House; curved driveway on lawn.

7. States. White House seen from an angle; sheep in foreground.

8. States. English castle; water and sailing vessel.

9. States. Custom house; water and shipping.

10. States. Distant view of public buildings through vista of trees; two women in foreground.

Borders, various designs.

Erie Canal at Albany.

Lafayette (portrait). "Welcome Lafayette, the Nation's Guest and Our Country's Glory."

Lafayette, Landing of, at Castle Garden, 1824.

Lafayette. Same, with inscription on back, "J. Greenfield's China Store, No. 77 Pearl street, New York."

New York Bay.

Peace and Plenty (shield, with American eagle).

Perry, The Temple of Fame as Introduced in a Print to the Memory of Commodore, by W. G. Wall, Esq.

Pittsfield, Mass., Winter View of.

Later, Clews issued a series of "Picturesque Views," in various colors. These were copied from water colors of Hudson River scenery, painted by W. G. Wall, the artist to whom reference has already been made, twenty of which were reproduced in colors in The Hudson River Port Folio, which was published about 1824, engraved by I. Hill.

## CLEWS.—"PICTURESQUE VIEWS."

—Designs in black, brown, red, purple, light blue, etc.—

Border, Birds and Flowers.



MEMORIAL OF COM. PERRY, "The Temple of Fame."

Allegheny near Pittsburgh, Pa., Penitentiary in.

Baker's Falls, Hudson River.

Fishkill, Hudson River, Near.

Fort Miller, Hudson River, Near.

Fort Montgomery, Hudson River.

Hadley's Falls, Hudson River.

Hudson, Hudson River.

Hudson, Hudson River, Near.

Junction of the Sacandaga and Hudson River.

Newburg, Hudson River.

New York, Hudson River (view of Governor's Island).

Pittsburgh.

Sandy Hill, Hudson River, Near.

Troy from Mount Ida, Hudson River.

West Point, Hudson River.

A series of dark blue prints on china was published by Clews, after the original designs by T. Rowlandson, illustrating Doctor Syntax's Three Tours, the first of which, Doctor Syntax's Tour in Search of the Picturesque, appeared in Ackerman's Poetical Magazine in 1809, and was republished in complete form in 1812. This was followed in 1820 by the Second Tour of Doctor Syntax in Search of Consolation, and by the Third Tour, in Search of a Wife, in 1821. These humorous poems made a great hit in England, and the eighty colored plates of Rowlandson furnished abundant material for the en-



terprising potter of the day. While in no way relating to America, a list of these designs which have been found in this country is here given, for the reason that they are eagerly sought for by collectors, on account of their decorative qualities and the excellence of their execution.

#### SYNTAX DESIGNS.

—Dark Blue. Floral Border.—

—First Tour.—

Doctor Syntax Disputing his Bill with the Landlady.  
Doctor Syntax Copying the Wit of the Window.  
Doctor Syntax Entertained at College.  
Doctor Syntax Sketching the Lake.  
Doctor Syntax Sells Grizzle.  
Doctor Syntax Reading His Tour.  
Doctor Syntax Returned from His Tour.  
Doctor Syntax Taking Possession of His Living.

—Second Tour.—

Doctor Syntax Setting Out on His Second Tour.  
Doctor Syntax and the Gypsies.  
Doctor Syntax and the Bees.  
Doctor Syntax Painting the Portrait of His Landlady.

—Third Tour.—

Doctor Syntax Setting Out in Search of a Wife.  
Doctor Syntax Turned Nurse.  
Doctor Syntax Presenting a Floral Offering.  
The Harvest Home.  
The Garden Trio.  
Doctor Syntax Star-Gazing.  
The Advertisement for a Wife.  
A Noble Hunting Party.

Another series of designs in dark blue, by Clews, was engraved from the celebrated Wilkie paintings and printed on china. Among these are found the following:

#### WILKIE DESIGNS.

Christmas Eve.  
Playing at Draughts.  
The Escape of the Mouse.  
The Letter of Introduction.  
The Rabbit on the Wall.  
The Valentine.  
The Errand Boy.

A third series of ceramic prints in dark blue, by Clews, illustrates the adventures of Don Quixote de la Mancha. Border, with scalloped line like six blunt pointed star. Flowers and birds between.

#### DON QUIXOTE DESIGNS.

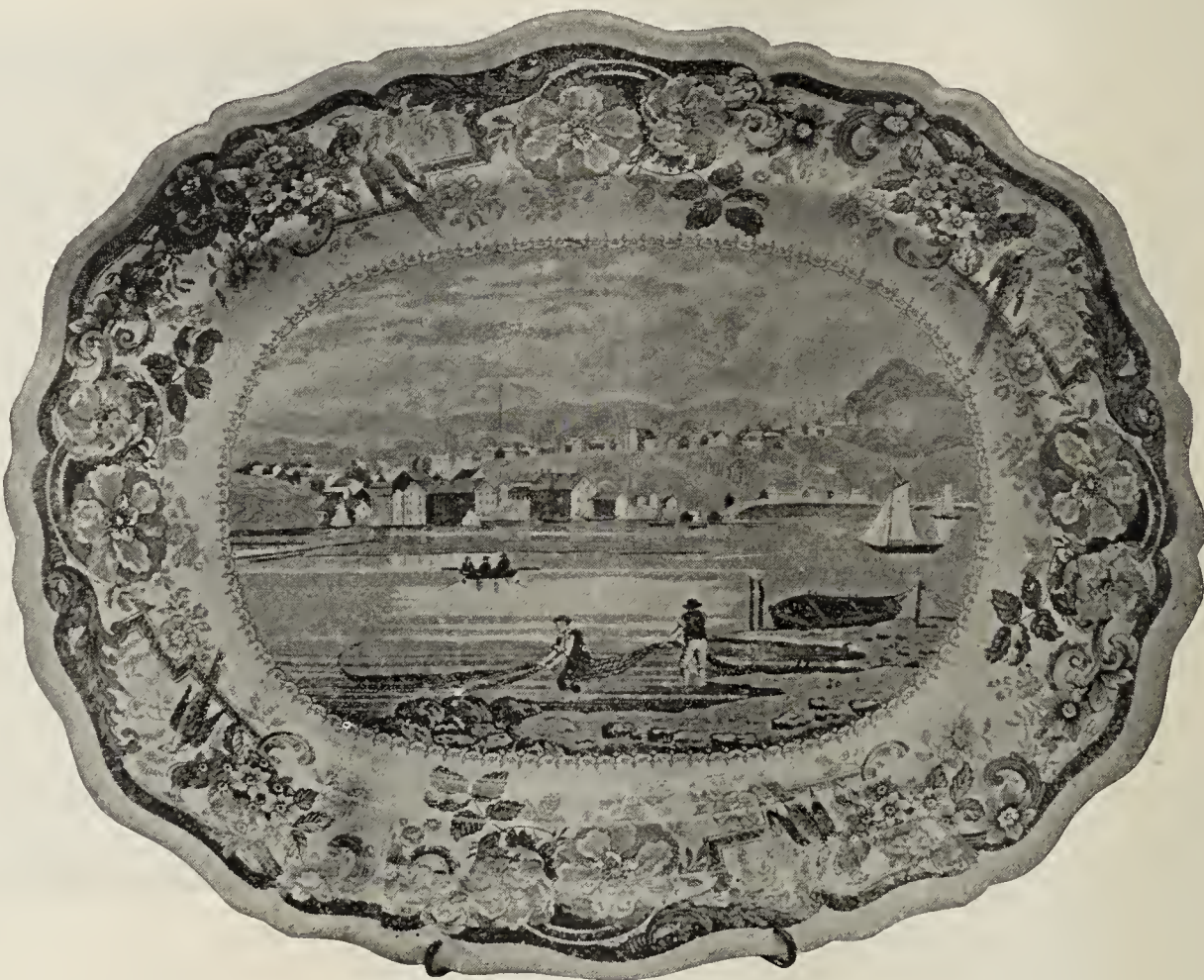
Don Quixote and the Shepherdesses.  
Don Quixote, Knighthood Conferred on.  
Don Quixote and Sancho Panza, The Meeting of.  
Don Quixote, Library of.  
Knight of the Wood Conquered.  
Mambrino's Helmet.  
Sancho and Dapple, The Meeting of.  
Sancho and the Priest and the Barber.  
Sancho Panza and the Messenger.  
Sancho Panza at the Boar Hunt.  
Sancho Panza's Debate with Teresa.  
Sancho Panza and the Dutchess.  
Sancho Panza Hoisted in the Blanket.  
The Shepherd Boy.

#### LET IN A LITTLE SUNLIGHT.

"The worst possible thing for a man to do when cares oppress him," says the New York Sun, "is to mope—to sit down and think it over. If there is anything on earth that will milder a man and make him good for nothing, that's it. What he wants is activity—to keep moving. If he can't work, or thinks he can't, let him get out and take a walk and start his circulation. It's amazing what a little fresh air and exercise will do for a man. Keep moving, and the first thing you know you'll find yourself whistling or humming a tune, and then you laugh to yourself a little and go back and go to work."

#### WELL-DESERVED SUCCESS.

THE OHIO Ceramic Engineering Company, of Cleveland, is a firm which, although not in the business as long as some of its competitors, has nevertheless made wonderful progress in the manufacture of clayworking machinery. For this they certainly deserve great credit, for it is seldom, indeed, that a new firm makes such rapid strides to the front and in a comparatively short time place themselves in so strong a position with the trade. They have been able to do this by reason of the fact that the engineers and designers associated with them are practical men who have made a thorough study of clayworking machinery. Ingenuity, working together with practicability, is usually productive of good results, and it is so in this case—so much so, in fact, that we feel fully warranted in stating that there is no better clayworking machinery in the market than that made by this enterprising company. Mr. Robinson, the President of the company, tells us that they make a specialty of represses and molds, and that their business along this particular line has been very good indeed. The Richardson repress is a remarkable machine in many ways. The points of superiority claimed for it by the manufacturers are many, and, judging from what we are able to learn from users



NEWBURGH ON THE HUDSON.

of the machine, they are warranted in making whatever claims they have set forth. In order to give any idea of its merit, we can do no better than reprint some of the "Points of Superiority" from their catalogue:

First—Great strength and durability; all strain on the side bars, and all working parts above mold, out of the way of waste clay.

Second—Crank and toggle movement which gives great pressing power—each brick being pressed twice on both sides.

Third—All movements positive, the result being that there is little complaint by users of the machine of ends of brick being cut off.

Fourth—Easily adjustable to wear, so that repairs are seldom necessary, and when required are inexpensive.

Fifth—Hard steel-lined mold and die plates.

Sixth—Mold can be removed from press almost instantly.

Seventh—Automatic charger for fine brick, which operates so that the clot does not come in contact with the pressed brick.

Eighth—Capacity from 20,000 per day up.

Ninth—Price the same as lighter built machines of other makes.

These are only a few of the superior points claimed by the Ohio Ceramic Engineering Company for their Richardson re-



press. A complete description of the machine is given in their catalogue.

They also manufacture a repress called the Century, which is somewhat lighter in construction, and which many believe to be as desirable as the Richardson for ordinary purposes. Any one anticipating the purchasing of machines of this class will do well to communicate with the manufacturers of the Richardson and Century before ordering elsewhere.

#### A NEW BRICK-CUTTING TABLE.

NO BRANCH OR FEATURE of clayworking machinery has received more attention of late years than the tables for cutting stiff clay brick. Inventors and manufacturers have been striving diligently to produce automatic devices to cut the bar of clay in desirable lengths for both side and end-cut brick. The problem is a difficult one, but American inventive genius has proven equal to the task. A number of automatic tables have been introduced during the past year or two.

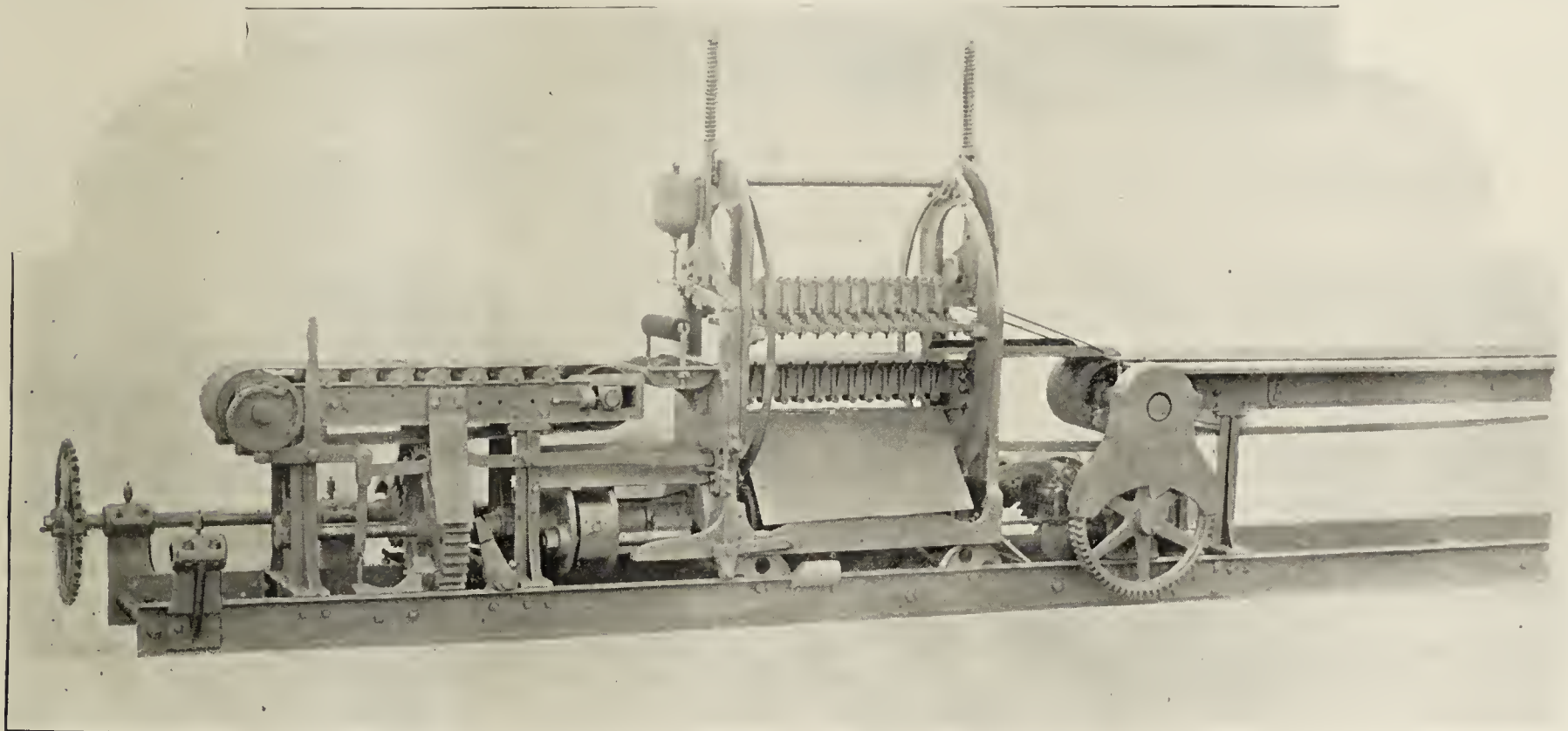
We illustrate the most recent addition to the number, which is a child of the inventive brain of W. R. Cunningham, Manager of the Wallace Manufacturing Company, Frankfort, Ind., and evidently is destined to be a valuable addition to their family of

it straightens the faces of the brick, also overcomes ridges or ruffled corners caused by the wire on the face of the brick. On the third section of the table is an apron or belt, which receives the brick as they pass from the cutting device, separates them, and conveys them to the men who remove them from the table.

One of the main features of this table is the short receiving-belt, it having nothing to do but to measure the proper amount of clay to be cut, and the few brick that are on the table after they are cut, which prevents them from sticking together after they are cut.

The operation of the table is about as follows: The bar of clay passes on to the registering belt, which unlocks the carriage and lowers the plates which clamp the bar of clay. The bar of clay, moving, causes the carriage to move, which throws a clutch in gear, which causes the wire frame to pass up or down in a vertical direction to cut the brick. The carriage moves to the end of this stroke, at which point the plates are raised automatically, releasing the bar of clay, and at the same time the carriage connects a clutch, which drives or returns the carriage to its original position, and which sets the carriage ready for the next cut.

The wires do not return through the column of clay, as some



CUNNINGHAM'S NEW AUTOMATIC SIDE AND END CUT BRICK CUTTING TABLE.

"Wonder" machinery. The new table has been in practical operation for some time, and has proven remarkably successful. The table cuts both end and side-cut brick, a feature that will make it especially desirable to many manufacturers who wish to make both kinds of brick.

#### —Construction and Operation of the Table.—

It is composed of three sections. The first receives the bar of clay as it issues from the die, and measures out the proper amount of clay for the number of brick that are to be cut. The second section is the cutting device, and has a reciprocating motion, traveling with the bar of clay while it is being cut, and returns after the cutting is performed. On this section or "carriage" the wire frames are mounted in substantial guides. The wire frame has a vertical movement, instead of a horizontal movement, as other automatic cutting devices. The wires are set on an angle, which gives them a shearing motion as they pass through the bar of clay. This insures more perfect work. The bar of clay is clamped on the top and bottom to prevent the bar of clay from slipping while the wires pass through. By clamping the bar of clay between plates on the top and bottom it enables us to cut both end and side-cut brick, the end-cut brick running from multiple dies. The pressure received on the bar of clay from the plates is a benefit to it, for the reason that

may suppose; it makes the cut upwards at one stroke and down at the next. The wire frames are operated by suitable cranks and connections. The table is well balanced, and is mounted on anti-friction wheels. The gearing and machinery are protected by shields from dirt or accident.

Those desiring further information regarding the table are requested to address the manufacturers, whose advertisements appear on pages 455 and 483.

#### THE DRAIN TILE BUSINESS PROSPERING.

S. C. Cowgill, the well-known tile manufacturer of Summitville, Ind., in a recent communication says: "The tile business is very good. We still have three or four weeks of orders on our books, and the prospects are very bright. Up to the present time our sales for this year are a third more than they were in '96, and a half more than they were in '97 for the same period of time. Reasoning in the way we have been in the habit of reasoning, I believe our prospects for the coming year are above the average, as we take it that when farm products command a good price our business is much improved, and I never saw a better prospect for crops or a more favorable outlook for good prices than for the coming year. War is a pretty big thing, and so far as it raises the price of products it will help us that much, but we will be contented with peace. We have booked several large orders recently, and have several more in view, which we hope to land; and while there is no great margin in our business, we think we have a splendid prospect."





THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

### In Troubled Waters.

Dear Randall:

It is with deep relief that I write to advise you of the improved condition of our loved friend Gates. As you know, he has been suffering for some time past, and finally decided to submit to a painful and severe operation. It was performed successfully, but following it an accident occurred, which for a time threatened to prove fatal. Thanks to a kind Providence, and a good constitution, free from alcoholic taint, he has rallied from the shock, and a speedy recovery is now anticipated. I cannot tell you how thankful I am, nor what a relief it is to feel that he is out of danger. He has suffered much, but his brave, sunny nature is only intensified, and we will soon have him with us again, and again enjoy that "same old smile." Then we'll appreciate more than ever his splendid social qualities. We are all to be congratulated.

D. V. P.

Chicago, Ill., April 21, 1898.

### The Good News Confirmed.

Friend Theo:

Your letters both came O. K. My recovery has been steady, and no backsets. Am very lazy, which helps me keep my promise to the doctors to be cautious. Have been going outdoors some for several days, and am at the office for the first time to-day, and this is my first letter. Am feeling as good as new. Hope to see you up here soon.

GATES.

Chicago, May 6, 1898.

### Congratulations From a Fellow-Sufferer.

Brother Randall:

I was very sorry to hear of friend Gates's close call, but more pleased than I can express in this brief note to learn that he is able to be around again. I do not think there is a member of the N. B. M. A. who would be missed more than friend Gates. He is a good worker, a good counselor, and always ready to put his shoulder at the sticking point and help land any laudable undertaking to a good starting level.

I feel satisfied there is no member of the Association who can sympathize with friend Gates more than or equal to myself. I have had two operations performed in the last four months, and would have another now, only the doctors say I would have only one chance in a hundred of coming out of it alive. Still, if I do not improve soon, I must take that one chance. I am not able to go out among the yards. If I was, I would write you what they are doing.

Remember me kindly to any of the members of the Association you may see. With my best wishes to yourself, I am, as ever, a friend to the Association.

JOHN McCAIN.

Denver, Col., May 3d.

### Sunshine and Shadow.

My Dear Mr. Randall:

It was with mingled sorrow and joy that I read your letter of the 28th ult., telling of the sickness of our much-loved fellow-member of the N. B. M. A.—Brother Gates—sorrow to learn of the severe illness and suffering through which he has passed, and joy at the final successful issue and his recovery. All hail to Brother Gates! A hearty handshake of congratulation, and good wishes innumerable for the future! May it be all the brighter, the happier, and the more successful, in the highest sense of the word, for the dark days just passed. A master of wit and humor is Gates, and the light of good will towards men

shines ever in his kindly eye. May he never be missed from the meetings of the N. B. M. A. for many, many years to come is the heartfelt wish of

Yours truly,

Boston, May 6, 1898.

GEORGE M. FISKE.

### A Terra Cotta Man's Hopes and Fears.

Friend Randall:

I was delighted to learn by your welcome note that our Brother Gates was safely over the crisis, and that the good fellow is likely to remain with us for an indefinite period. You said rightly, "There is only one Gates." When I contemplate the anxiety of the past few weeks, with its suspense of dread, I am dumb in the presence of the loss which would have fallen upon our brotherhood had he been taken away from us. But now the danger seems to have passed, I must for the terra cotta clayworkers lift up my voice in thankfulness to the good Father who has in his kind providence left us the presence and good-fellowship of our friend Gates. I congratulate his family and his employes. Long may he be spared to help the family of clayworkers! May we often yet note that cute wink, see his genial smile, and hear his friendly voice, all of which faculties we know he has devoted to the service of his fellow-craftsmen. May he yet live to serve as a tablet for some young member, even as he used our venerable Brother Pike. It were better far that the N. B. M. A. should lose some of its worn-out workers, such as

Yours sincerely,

JAMES TAYLOR.

### Wants His Buttonhole.

Editor Clay-Worker:

I was painfully surprised to hear of Brother Gates's serious illness, but words would utterly fail to express my pleasure at the news of his recovery, which, I hope, may be both rapid and permanent, and that there be no break in the series of "Buttonholes."

By the way, speaking of "buttonholes," I think the fiend (the buttonhole fiend) must be a good judge of human nature. If he had searched the world over he could not have found a better medium than Brother Gates. I use the word *medium* advisedly, for has not Brother Gates himself, in his frequent outbursts of confidence, alluded to "the man who makes my speeches?" Being somewhat prone to reminiscences, my mind wanders back to my first Convention (Indianapolis). Of course, I was at the powwow, and, being a new member, was naturally anxious to hear the speeches. Every one made was in a happy vein, but there was one which stood out alone as belonging to a different class. It was not so much of a speech, either, as it was a word-painting—a panoramic picture, an illustrated parable with the usual moral. I, oblivious to surroundings, in fancy followed the speaker to a finish, and then innocently inquired of my neighbor, "Who is that gentleman?" He simply answered, "Gates." His scorn at my ignorance was so painfully evident that I dared not ask what Gates; so, as it seemed everybody should know Gates, I secured an introduction. At that time, if I remember rightly, buttonholes were used only for their intended purposes, their later use by Gates seeming to be a new branch thrown out by the superabundance of sap in the parental trunk, and naturally have the same "nutty (not chestnutty) flavor" as the other branches, both old and new. If "the mouth speaketh out the abundance of the heart" and "a tree is known by its fruit," what a depth of good-heartedness is possessed by the King of Buttonholers—possessed but not monopolized, but, like the perfume of choice flowers, is communicated to and absorbed by an appreciative public. To say the least, "Buttonhole Talks" are always refreshing and acceptable, and the King of Buttonholers cannot be spared for many years to come; and I know that I am but a unit in the hearty congratulations to Brother Gates on his convalescence.

CARSON.

### What is a Fair Royalty?

Editor Clay-Worker:

This question was asked in the April Clay-Worker, and is a very hard question to get at, not knowing the amount invested in the plant and the price of clay land and depth of clay. Here we can buy good clay land, with from ten to fifteen feet of clay, for \$10 to \$75 per acre, yet in some locations the clay alone would cost 25 cents per ton. By the figures in the inquiry in regard to labor and fuel and the selling price of brick, one could not pay a very heavy royalty; yet the brick ought to be burned ready for market at a very low figure, and from the capacity of the plant it should turn out from 10,000,000 to 12,000,000 with a



very nice profit. I would say 50 cents per thousand royalty and rent for the use of the plant and clay would be about right. Say there was \$25,000 invested, and the plant would turn out 11,000,000; this would pay an annual rent of \$5,500, showing 22 per cent. interest on the investment; 2 per cent. ought to keep up all repairs, or nearly so, leaving 20 per cent. clear, which would be a very nice investment. Anyone wishing to rent such a plant, all ready equipped for business, should not complain on 50 cents per thousand. As I said before, it makes a difference where you have to pay a big price for clay land and have a large capital invested. Yet \$25,000 should equip a very nice plant, and one that should turn out 50,000 per day; yet this plant might have cost very much more. I think 50 cents would be a fair royalty for both parties concerned. Yet if I could see the plant and location, and examine the clay and learn more about the market, I might change my figures.

Suffolk, Va.

H. L. JACOBS.

### A Brickmaker Builds a Frame House.

Editor Clay-Worker:

We are having a late spring, but will commence molding brick to-morrow if the weather is favorable. I have sold all the brick we made last year, and could sell another good kiln if I had them. We made 418,000 merchantable brick last year, and expect to make 400,000 to 500,000 this year. The prospect is good for the coming season, as there is a good deal of talk of building.

I sold brick at \$5 per thousand last year. I can make a little money at \$5 per thousand, but we ought to get \$5.50 for them in small lots and \$5 in large lots. The trouble is they are cutting the price down in the towns around me, and although they don't make very good brick, the people will buy them occasionally and run them in here if I don't sell to suit them.

We have found a very fine bank sand on John N. Parr's farm, five miles northeast of here, and it beats anything for color that I ever saw. We formerly used creek sand.

Hope times will be all right this summer, as I am contemplating building a cottage. I expect some of the brickmakers will give me "Hail Columbia" if they find out that I am figuring on building a frame house, but I have never seen a brick house yet that looked worth shucks for style or finish, and a man ain't in it in this little town if he don't build a pretty neatly finished residence.

Well, I hope the war will be of short duration. It is, of course, unavoidable, but I would like to see the Spaniards knocked out quickly and the Cuban question forever settled.

But I must close. Wishing you success, I am as ever,

Your friend, JAMES H. HORNER.

Astoria, Ill., April 24th.

### Information Through Private Correspondence.

Editor Clay-Worker:

I am frequently receiving letters from readers of the Clay-Worker desiring some explanation or further information on some of the subjects which appear in this journal, and while I am always willing to give them the best I have, I must again request such readers not to expect it through private correspondence. I do not object to receiving their letters, but I positively cannot undertake to reply to each individually. The time at my disposal forbids it; besides, correspondence through these columns is certain to elicit more and better information than individual correspondence. No writer for this journal has a monopoly on any branch of science or industrial knowledge, and my observation has led me to the conclusion that there is not one of them who is not willing, nay, who is not anxious, to impart to an inquiring brother all that he can, especially if the inquirer is in trouble. A great portion of this letter is in reply to letters I have received. Each correspondent will easily see what portion refers to himself.

One asks on what authority I base my objections to the long, narrow grate in the Dutch kiln. I think I made that quite plain in my letter in March issue, and would advise Brother G. to read it again, but will say, in addition, that I did not accept without question the testimony of eminent engineers and scientists on the subject of long versus short grates. Oh, no; I was skeptical myself, and as it was a matter affecting my pocket, I did a little investigating on my own account, sufficient to convince me that the authorities were right. That was the commencement of my "monkeying" with grates, and the end is not yet. My findings in this matter are that it is not a question

of how far solid incandescent fuel may be pushed into a kiln or under a boiler, but how far flame can be conveyed. The production and maintenance of a good flame is the whole thing in a nutshell. Brother G. would at first, no doubt, question my sanity if I were to tell him solids were entirely unnecessary to make a good hot fire, but presently the truth would flash across his mind that they burn bricks very successfully with oil and natural gas. However, as a last resort, I would ask him to visit some of the kilns in this city that have outside furnaces; not an inch of grate in the kiln, consequently no solid fuel in it, yet they make equally as good burns and at less cost. I do not refer to any patent kiln or furnace, but the ordinary open-top kiln.

Brother J. complains of broken, checked and shelly arch brick, while the balance of the kiln is good. This reminds me of my first lessons in the manipulation of clay. With other children like myself, we used to visit the tuyre arch of a blast furnace and with the tamping-clay made marbles, which, if dried carefully, would stand burning in the kitchen fire and make passable goods, but if hurried by putting on the hot tuyre pipes to dry, would crack and fly to pieces. The same would occur if put right into the hot fire, but put well dried marbles on with the coals and let them sink gradually into the fire and drop through into the ashes to cool, and they were all right. Since then I have found that the temper of clay and the temper of humanity is very similar: Most people may be led or coaxed, but not driven. The same with most clays. Harsh treatment has spoiled many amiable tempers, which also applies to the tempers of clay. The simile need not be extended.

Everybody is, or ought to be, familiar with the effect of sudden heating and cooling of glass, and as every effect is preceded by its cause, we should in every instance look back into the cause, and in many instances it will even be necessary to probe deep enough to find the cause of that cause; for every cause is simply the effect of a still preceding cause, and so on ad infinitum. I have no desire to lead my readers into any labyrinth or mysticism, but it is highly necessary to properly connect the effect with its cause. The next step is to remove the cause, and the effect will cease. From the information contained in Brother J.'s letter I can only draw two general conclusions: First, the arch bricks may be checked and bursted by too sudden heating while watersmoking, or, second, they may be thus damaged by sudden cooling. It is just possible that some damage may be caused by firing with wet wood (Brother J. uses wood for fuel). At any rate, no good effect can be made on hot bricks by introducing wet fuel. What is practically known as dry wood contains from 20 to 25 per cent. of moisture, while green and wet wood may contain over 50 per cent. The probability, however, is that drafts of cold air during the burn, or after it is over, are responsible for the mischief. There is a method of firing still prevalent that does not belong to the present age, and which ought not to be tolerated in any yard or establishment; that is, the practice of firing up heavily and burning very low. This is a very wasteful and destructive practice, without one redeeming feature for the manufacturer; it does, however, permit the burner to sleep longer between charges at night.

What I have said above about value, production and maintenance of a good flame cannot be realized by any such system of firing as that just described. It must be just the reverse—light firing, and, of course, often; that is, it must be so timed as to keep the fire vigorous and good all the time, as nearly as possible. If your furnace is full of flame, you may rest assured no gusts of cold air are rushing in.

When a kiln has been carefully burned, give it a chance by careful cooling, especially if your bricks are of the very sensitive type. If your kiln is one with inside grates, put a light fire on in front of each arch, and close up tight; this will neutralize any draft that may accidentally enter at the bottom, and with a good platting on top, hot gases would ooze out of any crevice instead of cold air rushing in. Let the kiln have all the time to cool you can afford, and you will have a larger percentage of good tough bricks.

The questionable advantage to be derived from using the waste heat of a cooling kiln is out of question with anyone who makes a sensitive brick; there would be no objection, however, to devoting some attention to using the waste heat from a burning kiln, the use of which entails no risk of danger to the bricks that are burning. I will not now deal with the disposition of waste heat further, as there are several manufacturers experimenting in this line who will, no doubt, be heard from in the near future. I will therefore confine myself to methods of firing for the present, which will not only deal with methods of adding fresh fuel, but will also point out its advantages in excluding gusts of cold air. I am fully aware of many who have the old inside grates and could not afford to tear them all out and erect outside furnaces at one stroke, but there are few, I presume, who could not tear out one arch clear through, or, better



still, maybe, tear out two grates on one side and erect a furnace to supply both arches; this would neither cost much nor take much time. Next tear out the two on the opposite side and erect a similar furnace, if the first proved satisfactory. This would give one end of the kiln a chance to compete with the other, and results could be compared. If the change proved beneficial, which I feel sure it would if properly made and operated afterwards, then as opportunity and the pocket-book offered, change a couple more, and so on to a finish. With cord wood for fuel, there would be no need for grates nor any expensive fittings—simply a rectangular chamber with flat arched roof, with sufficient binding to sustain the thrust of the arch; a convenient hole to charge in the wood, and a fire brick tile to cover the hole when the firing is over; a suitable hole leading into each arch of the kiln, and a few holes through the sides of the furnace to let in air for combustion; these holes should be on the furnace floor level.

In my next I purpose continuing this subject, and will furnish sketches of furnaces that have proved successful for the production and maintenance of heating flame, which is a sine qua non in every case where intense heat is the chief factor.

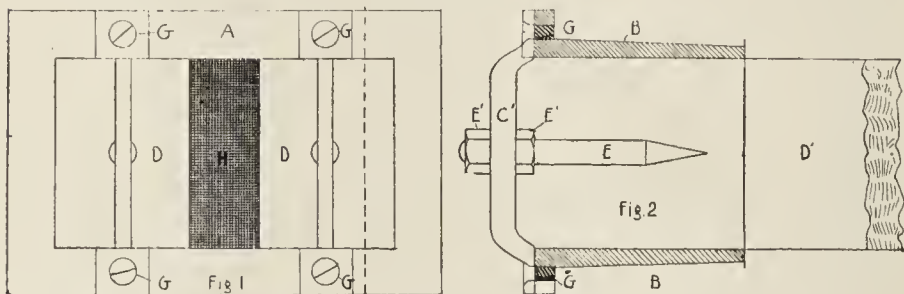
WILLIAM WAPLINGTON.

### Remedy for Cracking Brick.

Editor Clay-Worker:

We have been readers of the Clay-Worker for a number of years, and have derived a great deal of information from its pages. Your contributors have a way of offering practical suggestions in connection with the little details of brickmaking that make the Clay-Worker much more valuable than ordinary trade publications. At any rate, it is far ahead of any that we have seen. Having profited by the practical suggestions and experiences of other readers, we desire to contribute our mite.

Like all brickmakers, we have our own troubles. We have been bothered a great deal by the cracking of our brick while drying, and have found what seems to be a cure in an attachment to our die, which consists of a cast iron retarder which screws fast to the back part of the die the four-inch way, in the center of which is screwed a three-eighths or one-half-inch rod, which extends in the die and is filed to a point. The length of this rod depends on whether the hole closes in the bar of



clay as it passes out of the die. If it does not do so, the rod is too long; a short piece should be cut off and again filed to a point. The accompanying sketch will perhaps give a better idea of the contrivance. Fig. 1 represents the back end of two-stream brick die. Fig. 2 represents a sectional view of the same through dotted line of Fig. 1; A, the outer wall of the die; H, the center partition between two dies; D D, the dies through which the bar of clay issues; C C and C<sub>1</sub> are bridges secured by screws G G G, and which support the rod or core E; E<sub>1</sub> and E<sub>1</sub> are nuts to adjust rod E in and out; D<sub>1</sub> represents the bar of clay as it issues from the die broken off.

We realize that, while this scheme works admirably in our clay, it may not do so in a good many other clays. It is a simple affair that is well worth trying by those troubled as we have been by the brick cracking in drying. It saves us money, as we have 90 per cent. less cracking in our stiff mud brick than without it.

Wishing the Clay-Worker the success it so well deserves, we are,  
Sincerely, B. H. REED & BROS.

### Profiting by Experience.

Editor Clay-Worker:

In the last issue of the Clay-Worker the article on "The Ohio Valley Clay Works Afloat" is very appropriate. Last spring I built a 60x130-foot hot floor dryer, using wood above the ground, and had about thirty anchors built in foundation. After the high water I found that one anchor had pulled off a section of one side of the dryer, and had held it fast to the foundation, while the other twenty-nine had pulled out and left with the building. Now I am building the only dryer that a

brickmaker can get satisfaction from, and that is a brick tunnel car dryer. This dryer will hold thirty thousand brick, and will be a great benefit to my plant. I have cars and all material on hand to complete it as soon as the brickmasons have finished their work. This has delayed the season's work in a way, but hope that the ill wind will blow its good later in the season, as the prospect is good for a big season here.

I have just now heard that our State militia has been ordered to Charleston, the State capital, and Major Morrison has been ordered to recruit a second company here immediately. We already have Company E, Second Regiment. All of the First Regiment will pass through here to-morrow. This kind of business may not help the brick business, but it is to be hoped that it will not hurt us.

Herewith please find check for \$2 for '98 subscription.

Parkersburg, W. Va., April 23, 1898.

C. B. E.

### Continuous Kilns and the Convention.

Editor Clay-Worker:

A remark of mine at the Pittsburg Convention, I was sorry afterwards to find, was by some members misunderstood—that is, in the sense it was intended. I said that "every brickmaker knows that continuous kilns are expensive to construct, and if this is not done right, they will cost as much to maintain." Now, I do not wish to undervalue this type of kilns, or to injure the interests of patentees, or anybody else, by an erroneous impression that they are prohibitively expensive to construct; but I do wish the latter part of the sentence to be taken to heart, viz.: "If this is not done right, they will cost as much to maintain." Having due regard to capacity—that is, the quantity of bricks burned per day—they are rather cheaper to build than the average down-draft kiln, and it is also conceded that for a certain class of goods they are far more economical in burning; but any slipshod construction will tell far more forcibly in the continuous than in the down-draft. Don't think from this that I advocate slipshod construction anywhere, because I do not; but the continuous kiln offers many more opportunities for this than any other kiln, and often they are eagerly seized and hid under the cloak of economy. I have known continuous kilns that were continuous in two senses—continuous in burning and continuous in repairing. Any advantages they might have possessed were smothered by the repair bills. If you are going to build one, build it right, even if it costs a few dollars more to do it; you will more than save it in a short time, both by better results and an absence of heavy repair bills.

The remarks of Mr. Ittner and Mr. Bleninger on the subject of burning face bricks in this class of kiln are interesting reading, and I am truly sorry the exhibition room, and not the Convention hall, held me at that time. I have burned the highest grade of face bricks (both red, buff and vari-colored) in the continuous kilns, but it was not by the ordinary system of top-firing; in fact, as Mr. Haigh remarked, it is not possible to get the results called for in high-class American face brick by the top-firing system, on account of the far-reaching discoloring action of the fuel that is fed amongst the bricks. This can only be successfully attained by side furnaces or inside producer boxes in the use of coal, or by using gas or oil. Producer gas will enable the finest kind of facing bricks to be burned in the continuous kiln, with very little change in the construction, but as this system is not in the reach of every brickmaker, the next best is properly constructed furnaces, allowing of approximately perfect combustion of the fuel and keeping the ashes away from the bricks. I have tried to burn paving bricks with the top-firing-in-amongst-the-brick method, but not successfully. There are too many hinges to the operation to make sure work. It may be the fire-holes or fuel "chases," as styled by Mr. Ittner, get full of ashes or unconsumed fuel before the heat required to vitrify the brick is attained, making it impossible to hold that spot any longer; or it may be the cold air is "coming up on you" and back firing is not advisable, or other points, maybe, that are well known to the practical burner, all contribute to the uncertainty of burning paving bricks in this style of kiln. This method of cooling the bricks has been questioned as to its effects for good, but it is on correct lines, and if the bricks can be successfully burned they are only benefited by being cooled off on the continuous principle—at least, that has been my experience.

Reverting once more to the stack question, a case in point may not be out of place. Some time ago the Laprairie water-works burned down, and in rebuilding I persuaded the owner to build a brick stack in place of the former iron one. He did so, and told me a few days ago that he was glad he did, because he was saving coal by the change. I have heard as an objection to brick stacks that they allow the infiltration of air, and so detract from the effective force of the draft; but with good bricks,



properly bonded, this cannot be. Even allowing the point of infiltration, it would not be nearly so injurious to draft as the radiation by the iron. This is allowed by some engineers, and to compromise matters they line the inside with bricks, combining, as it were, the good properties of each. Taking into consideration that the iron part of the stack must be well painted, in some cases every year, it will pay to use a few more bricks and have a good stack from the start, bearing in mind that, whether the stack is built of bricks or iron, height is a very necessary measurement, depending somewhat on surrounding topography, but in any case not less than one hundred feet from flue inlet. You seldom or never hear of a stack being shortened, but it is common to hear of and see them being heightened. Build it right at once; it is cheaper.

CARSON.

#### Wants it Oftener.

Editor Clay-Worker:

Enclosed please find our check for \$2 for our subscription to the Clay-Worker for '98. Don't want to miss a single issue. We yearn for the monthly appearance of the Clay-Worker and wish you could see your way clear to get out such a splendid paper weekly, instead of making us wait a month between the feasts on its excellent contents, especially its artistic features.

As for our business, we long to meet some of those enthusiasts who paint such glowing pictures of the roofing-tile business. We should like to play Rugby football with them to the dirge that breakage, checking, warping and flashing does with our illusive profits. The roofing-tile business is satisfactory if—(but what a gigantic if)—we could get out 100 per cent. yield, but with the dump growing faster with scrap tile than the stock pile we are anxiously looking for some other tender-foot who has not yet been shorn by the enthusiastic patentee or alluring machine man.

STANDARD TILE COMPANY.

St. Louis, Mo.

#### The New York Market.

Editor Clay-Worker:

The market has been taking stock about as fast as the brick arrived, but with no advance in price—rather a decline. So many yards have no stock it was taken as a fact that there would be a rally. There seems to always be a big "if" in the way of the trade. The war has put a cap on the trade, and to still further help to push it down the stonemasons are on a strike and are locked out. To further push it down the new Mayor is so afraid that the debt limit of the city will be exceeded he has stopped all public building, i. e., he wants to put the reform administration of his predecessor in a hole as a maker of politics and to show how much Tammany is in sympathy with the taxpayers. To still add strength to the push-down, the capitalists will not advance money on speculative building, so that the near future is of a color not at all bright. Pale, \$3.50 and \$3.75; hard, \$5.50 and \$6, with but few of the last-named sold.

—Where Is the Profit—

In this barge load? I watched a neighbor loading recently, and noticed that it took him about a week. The number of swelled brick in the kiln was so large it took seven arches to make about half a load, or 125,000. The boss has changed his foreman this season.

—The Season of '98—

Has begun in the brick trade. Some yards molded on the 20th for the first, but up to date (the 29th) have not gotten out but two pits. Rain—nothing but rain!

—Labor Troubles.—

The prospect is so good that yesterday morning on two of the yards, where mostly Poles are employed, they would not go to work—that is, some of them. As the proprietor paid them for the daily time the night before at the same scale as last season, the little money they had coming furnished rum, and rum furnished courage, and they went to the next yard and stopped the men, and so on to all the yards. As it looked like rain, some of the men went to hacking brick. They stopped them. Some kept on, and they handled them rather roughly, and would have killed one man if the second hand had not interfered. The sheriff was called out, and with the assistance of deputies arrested three or four. They will not accomplish their object, as

there will be no advance in wages. One boss told his men when they went to work this year that he would advance their wages fifteen cents per day, payable to those who would be working on the yard when he stopped next fall. He will not be called on to pay many the fifteen cents advance, as the majority will be scattered from Maine to Texas, and some in Cuba.

Hackensack, N. J., April 29, 1898.

A. N. OLDTIMER.

#### Now for the Next One.

Friend Randall:

I am just home from having made quite an extended trip after the Convention, so have had but little chance to read the report, but am pleased to say "I was there."

It being my second Convention, I cannot look backward to a great extent to make comparisons. Was so favorably impressed, shall make great effort to attend those to follow. Believe all brickmakers and clayworkers should attend, and if they will, and give their full attention to the work, it will be an investment paying large returns, not only in a financial way, but in becoming better acquainted with their "partners in business," as all clayworkers are to a certain extent. At the Pittsburg Convention the papers were exceptionally good and to the point, the discussions prompt and instructive. The entertainment—well, brickmakers of Pittsburg pugged and molded it, and it was of the best.

Hoping to meet Convention acquaintances at future Conventions, I remain

Fraternally yours,

Vicksburg, Mich., March 22d.

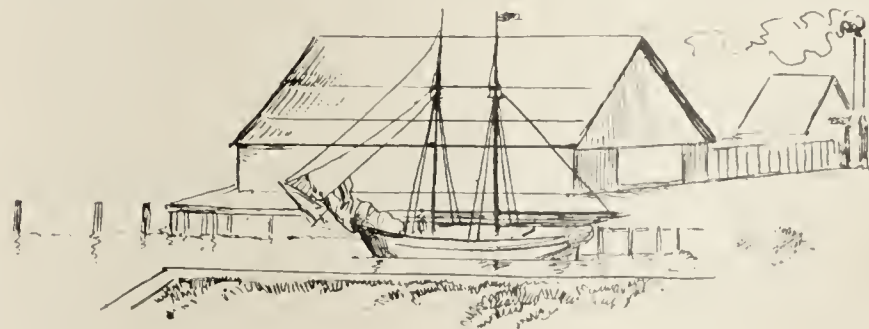
J. EDSON CLAPP.

#### A SEASHORE BRICK PLANT.

ONE OF THE OLDEST brick plants along the New England coast is that of Mr. David Graham, which was established in 1850 at Ashamomogue. This place derived its name from an Indian tribe by that name, and was located on the east end of Long Island on the Peconic bay. This lovely bay is thirty miles long and from three to seven miles in width. Greenport and Sag Harbor are on this bay. These two ports, in 1852, were the largest whaling ports in the United States, there being over a hundred ships engaged in the industry. This is also a great summer resort and a fine yachting center. I have seen as many as a hundred yachts lying at anchor in Greenport harbor at one time. Plumb, Gardner and Shelter Islands are located in the entrance of this bay. Our government is placing strong fortifications on Plum Island. Gardner Island is noted in history as being the place where Captain Kidd buried part of his ill-gotten treasures. Shelter Island is the largest of the three, being seven miles long and three wide, also a great summer resort. In giving a brief description of this beautiful bay I have diverged from my subject.

Captain Sandford bought this plant in 1891, fitting it up with a capacity of six million brick per year, made on the pallet system. His clay is hauled from the bank in carts, from which it is dumped into conveyors leading to the disintegrators, from whence it is taken in conveyors to the pits, where it is soaked. This process prepares the clay equal to clay tempered with the wheel. He is making a very fine brick, equal to the best brick made on the Hudson river. He is using the New Haven brick machines. He has the finest shipping facilities in this section, having dug a channel in from the bay six hundred feet long, the entire length of his kiln sheds, so that the vessels lay close into the shed and opposite the kiln of brick. The brick are loaded one hundred on a wheelbarrow and wheeled on board the vessel and shipped all along the Eastern coast. In the States of Connecticut and Rhode Island the brick, delivered, bring \$7 and \$7.50. The freight is \$1.25 per thousand, leaving a return of \$5.75.

G. O. RIGHT.





## WHAT'S A FAIR ROYALTY?



**FAIR ROYALTY** on the output of a brickyard of 50,000 per day should be an easy matter to settle by "Enquirer," without any comparison with any other yard or what some one else should think ought to be the proper figure. Possibly he does not want to charge the renter too much, but give him a show. There are several things to be taken into consideration as well as those set forth by "Enquirer."

**MATERIAL.**—Is there plenty of clay and sand to last for a number of years? If not, it would be a factor for a higher rate, as the material might run out during the lease. Other property adjoining would cost more to purchase under such conditions.

**THE COST** of the plant and land in the first place would figure at a given rate per cent. as a basis on which one would expect a return, as in case of a mortgage or bond investment, with no depreciation. This would be the case with the plant and the consumption of clay.

**THE FIRST LEASE.**—The one now in question, if the yard is a new one, will have but few repair bills in the first five years, except the breakage. If the plant has been running for some time, the item of repairs will be considerable, so that the cost will fall on one or the other, the lessee or lessor, as per agreement in lease. If an owner of plant, he will look for a figure to cover that part; if on the other, he will want it taken off or the royalty made low enough to help out.

**EQUITABLE** seems to be "Enquirer's" desire on the per thousand of brick. Why not on several other ways of leasing yards, as is the custom in other sections of the country? As the capacity is known, why not make so many brick for so much money? Then the owner will not have the trouble of counting each kiln or arch to see that he is not being imposed upon. Another way, and the most just and equitable for both parties, is the percentage plan. If brick rule high, the owner gets a good return for his investment, and the other party can afford to pay a good big rent. On the other side, if the rates are low, it helps the tenant to pull along through dull times. As this method calls for a settlement of bills, it proves to the landlord the price as well as number of brick made and sold, without counting or keeping track of each kiln or number of arches made. When the season is over the number of brick under shed added to sales will prove the output to the satisfaction of the owner. Some landlords are regular Shylocks.

**A CASE IN POINT.**—The yard was leased for \$1.25 per thousand, rent quarterly in advance, and all brick made over the four million called for in the lease to be paid for on the 1st of January of each year. As there were always five million or more made after the first of the year, he had all his rent. The tenant counted each arch; as they set fifty high, he counted the twentieth course which would favor the landlord, as it is well known that a kiln batters and is not as wide on top as bottom, and again some setters carry their heads up quite straight, and where fifty wide is the usual width, it may show fifty-one or fifty and one or sometimes two brick. If the landlord should count the arch that had the fifty-one in it, he would call the whole kiln by that figure. As all kilns have a center arch with less brick in than any of the other arches, he made no allowance, but all went. As the tenant kept a tally of each arch, when the comparison on yearly settlement was rendered there were several thousand more claimed by the landlord than by the tenant, making in all about one arch. The tenant refused to pay, as he had all necessary data to show his side of the case. The result was that the landlord tried to prove his case by the number of pits molded, with so many to the pit, and proved his case. He was not willing to allow that probably no two pits would turn out alike, as the dumpers do not always dump as close day after day, nor would he make any allowance for spoiled brick; but, right or wrong, it must be as he said. After two weeks' correspondence over the matter of about \$50, he reluctantly had to give in, as the tenant would stand suit before he would pay. If the percentage plan had been used, there would have been a record matter that would have been hard to dispute.

Honest landlords and upright tenants have no trouble, but the dishonest landlord wants all in sight and more, and the tenant generally finds some way to get even. As the above-mentioned landlord was so exacting in his accounts, another tenant took this method of beating him. I say tenant—it was a woman; her husband died before the lease expired. The foreman was the one, of course, who engineered the job. As they set fours, he put in as many fives as he could and kept his kilns

walled up so that the landlord would not notice it. Some one told the landlord of the trick, he sued, but never gained anything. Again percentage would have done away with crooked work.

**LOCATION AND DEMAND** cut a large figure in the rent schedule. Such times as the present—and for the past three years—favor the renter. The landlord is anxious to have some income, and has leased for a term of years, and at a figure that no one would have thought would ever be reached. Haverstraw has always reached high in the market as a place for good returns on an investment in clay property. When times are in a fair condition or there seems to be a prospect of a profit in sight, no idle yards are to be seen. But a change has come; the landlord who can hold a tenant or succeed in leasing a yard which has been lying idle for from three to five years is congratulated. In the case of "Enquirer" there seems to be nothing on the face of the inquiry to stand between a fair basis as regards royalty.

**MARKET.**—To take all made, how lucky that man will be who can make to capacity and sell them all. It is something in the brick trade that is commented upon, that when a vessel takes cargo to market she never brings anything back. But few lines of trade can make that showing. In this case, sale for all at the shed and the average price \$4.25 per thousand during the year, which shows that the rate falls below that point and probably a goodly number below it.

**COST OF MAKING**, as partially set forth, is not what could be called high. The filling of the pits at the cost of twenty-five cents per thousand is at least from 7 to 8 cents per thousand above what it costs to fill here, and in some places along the Hudson it is still lower.

**LABOR** that will catch the eye of the brickmaker—80 cents per day. Why, that must be a snap, many will say. Where can that plant be, and what kind of men are they, when the average is only about one-half, if as much, as with the general run of yards? It is not all gold that glitters, and it would be best to think over that point, as it is one that runs up the cost very fast, and it is also one that is to settle the rate of rent on this yard. Take it as a whole, the cost clause says the renter, having no outlay but the operating expenses, would go to show that the cost of making is low, and the tenant can afford to pay a good rent. President Harrison is credited with saying, "A cheap coat makes a cheap man." With the average 80-cent man, it would take about two to do one man's work, and to make that average it would seem as if the man who can burn 95 per cent. hard brick cannot receive a very high wage for the ability to produce such a percentage of No. 1 brick.

**WOOD AND COAL** is not high, but whether it is the delivered on the yard price, it does not say. If the \$2.10 is dust, it is higher than with us. If \$2.50 is pea coal and not delivered, it will be about the same. Here pea coal for engine is delivered to the engine house each day as required for \$3 to \$3.25 per ton; the other incidentals are not mentioned.

**COMPARISONS.**—The royalty of a few years ago cuts no ice to-day. There are yards in Haverstraw which \$1 per thousand was the figure and the landlord furnished steam; another, 75 cents, and the tenant owned all the fixtures, that is, shed, kilns and pit, as well as engine, and furnished his own steam; again, \$1.25, with shed and pit-shed and steam furnished by landlord. Now the rate is not uniform, but what you can get. The dollar rate is in some cases 60 cents and steam furnished. Now the yard where formerly 75 cents and fixtures owned by the tenant prevailed is leased for 12½ per cent. net, freight and commission out, or say \$5.75 selling price, freight and commission \$1.25, net \$4.50—12½ per cent. or 56¼ cents per thousand. This year one of the yards which has not turned a wheel in three years, and formerly leased for \$1 per thousand, was leased for 45 cents per thousand and steam furnished, making a royalty of about 30 cents per thousand. Here the only yards which are leased are about on a plane with that rate, only with more benefits in the way of more material on the yard for use, such as machine, wheels and loose lumber.

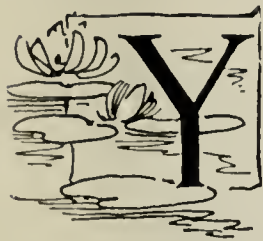
**A FIXED OR SLIDING SCALE.**—In answer to "Enquirer" would say, if the cost of making is not any higher than represented, and the returns will average \$4.25, if a fixed rate is agreed upon, 45 cents per thousand would be a fair rate. If a percentage of say about 10 per cent. or a trifle more, to make the rate to hold up to the fixed scale, with a clause that the tenant should make at least brick enough each year to pay at the given per cent. the interest on the investment. As times might be such that he would not be in position to make to the full capacity, this would be fair to both parties.

**A CLAUSE** in some of the yards, where percentage rules, is that an average of so many millions per year are to be made, say two when the capacity is four, or on a five-year term would be ten million, as some years they might make the full capacity, it gives them the privilege of lying still, as there are only so many called for to be made in the five years.

ON THE HUDSON.



## BRICK AND BUSINESS IN THE DISTRICT OF COLUMBIA



OUR CORRESPONDENT recently went upon a tour of investigation among the brick manufacturers of Washington, in order to find out the status of this industry here, and to get the opinion of the men engaged in this work as to the effect of the present war upon their business prospects.

As a collective result of my inquiry, I will state that the "war scare" has caused a general falling off in the brick trade here, consequent upon that feeling of uncertainty and general trade restriction which is the usual accompaniment of national belligerency. But all the brickyards are running, and it is very possible will continue—excepting one—with a reduced output until capital again "feels the earth solid under its feet" and business gets upon a "peace footing." Naturally we of the Nation's capital are more concerned than other communities, so we judge, from our own conditions, that the effect of the war will not be much felt at other points.

The company here mentioned, which will suspend operations near the middle of May, is the Brick and Terra Cotta Company, situated at Delaware avenue and Sixth street, S. W. This company began business in 1891, and since then has done a great deal of work, employing at present three machines—a Chambers, a Boyd and a Simpson—with an aggregate capacity of 80,000 bricks per day.

The Washington Brick Company is now running with half force, employing one Graham wheel machine and a Raymond for repressing. When business was good this company produced a large portion of the bricks made in the District of Columbia, and its disbursement for wages alone amounted to about \$100,000 annually. In one contract for the new Congressional Library it furnished 19,000,000 bricks.

The brick company represented by the West Brothers, whose office is at 718 Fifteenth street, in spite of war times, is doing a good business. Their output, from one Graham wheel machine and four Raymond presses, is about 50,000 brick a day, and 20,000 per day by hand. The latter are a superior quality of selected red pressed brick used for front work. The West Brothers recently finished a large contract made with the United States Electric Light and Power Company for their building, situated at Fourteenth and B streets, N. W. This structure will contain one of the finest and most modern light and power plants in the world. When completed it will represent an aggregate of 3,000,000 brick, the greater number of which was furnished by the company last mentioned. The company will also furnish 600,000 rough and 80,000 select red brick for the Peabody School building, now in course of construction, which, when, finished, will cost between \$35,000 and \$40,000. A new brick just coming into use here is called the "Colonial." It is about  $7\frac{1}{2}$  inches long by  $3\frac{1}{2}$  inches wide, and is used in front work to produce a black-and-white effect, the short face being black and the other white. This kind of brick is said to have been used in colonial times—hence the name. West Brothers are making this brick, and at present supplying it for a house in Washington being built on old colonial style.

There were something less than 3,500,000 pressed front brick used in Washington last year. Of these the Hydraulic Pressed Brick Company furnished (as I was informed by its secretary) about 85 per cent. The output of this company is quite large, and its product this year, until the war began, was greater than that of 1897. It ships to New York, Philadelphia, Baltimore and Southern cities. The product includes plain and colored brick, and prices range from \$12 to \$33 per thousand, according to kind.

The Morrison Brick Company, the output of which last year was 6,000,000 brick, has had a fall-off in business on account of the general war effect, as has the Virginia Brick Company, represented in Washington by Mr. C. B. Pearson. Business with the latter company, whose productive capacity is 40,000 brick per day, is very dull.

So, upon the whole, it seems that fighting the Spaniards (although many war prophets (?) have declared that hostilities would last only a few weeks) has made the citizens of the District tighten their purse strings, refusing to buy brick and build houses, lest by so doing they become losers. I am informed that money is "cheap" here, and that recently a large loan was negotiated at 3 per cent. If such is the case, then the business "hitch" must be in the minds of men, where it is labeled "uncertainty."

But there is, of course, some building going on in the Capital

City, and in its suburbs. A large building on Fifth street, N. W.—the Columbia—is being put up, as are an apartment house (to cost \$50,000), an important addition to the Raleigh Hotel, and quite a number of dwelling houses, ranging in quality from those of the cheapest kind to a few costing from \$30,000 to \$40,000.

In the little suburban towns around the city the wooden house prevails; brick are seldom used, except for foundations and chimneys. School houses in these places are nearly all built of brick—as they should be for durability, comfort and safety. And these qualities, it appears to me, apply as well to places of dwelling. The "hope of the nation," the public school house, with the American flag flying from its roof, forms a frequent and usually imposing feature in red brick in Washington. There is a great deal of money spent for brick for this purpose. Uncle Sam's school children are well provided for in respect to shelter, while their minds, like clay, are being molded for future usefulness.

A brick building, something out of the usual kind in the District, is now being built in the northeast a few miles from the city. This is to be a monastery, which, when completed, will be in dimensions about 250 feet long, 100 feet wide and one story high. It will occupy a commanding site overlooking a wide stretch of beautiful country.

In this neighborhood are Forts Totten and Bunker Hill, built to protect Washington during the civil war. But perhaps the most interesting place in view from here is the ancient town of Bladensburg (a little chat of which and its environments may not come amiss these red-hot war times), with its bizarre old brick houses and air of obsolescence that abridges time and takes one back to years remote and historical events. To the right of the town is the "green mound" behind which the British formed on August 24, 1814, before the eventful battle, which terminated in what is known as the "Bladensburg Races," and in which the Americans took a leading part. Amidst the green hills that seem to be sleeping in the sunshine, the British, under the man who conveyed Napoleon Bonaparte to St. Helena (Admiral Sir George Cockburn), and General Ross, decided the fate of Washington City, which lighted by the blaze of its buildings the retreat of its defenders. But for the numerous hills and trees the old road, over which the British marched to the city and to their work of destruction, could be seen from the neighborhood of the monastery site. By following this road, or the one further north—which was made before Washington was founded, and ran from Georgetown to Bladensburg—the famous old dueling ground, near the latter place, is found. This is rich in ensanguined history, but smiles in vernal beauty as if it had not drunk the blood of strong manhood and heard the last sigh of departing life. On this ground, March 22, 1820, Commodore Stephen Decatur faced Commodore James Barron in a duel at eight paces. Decatur was mortally wounded, and died after being taken to Washington. Here also was killed General Mason, United States Senator from Virginia, who fought with his cousin, John M. McCarty. Other believers in the code duello met and fought on this famous field of honor, so dear to the bellicose fire-eater, whose motto was "What is life without honor?" and not "What is honor without life?"

To the west of Bladensburg is the plant of the Potomac Terra Cotta Company, which has been doing business in the District for many years, making, among its other products, a great deal of excellent large sewer pipe.

But let us get back to the city, where there are more brick than in the suburbs. In fact, that which—in relation to buildings in Washington—is not stone is pretty much all brick. The stone feature consists principally of fronts or ornamental work, but in the latter molded brick are extensively used.

Perhaps one of the most unique of the brick houses in the city is that which occupies British territory and is inhabited by Sir Julian Pauncefote, the British ambassador and his family and staff. The remarkable feature of this royal abode is not in its architecture, which is rather plain for so important a purpose, but lies in the striking combination of red brick with broad white lines between them. This, if I remember correctly, is peculiar to the N street side of the ambassadorial mansion. The front of this palace is not without some attraction, though this lies rather in the columned porte cochere than in the building proper.

The northwest portion of the city is the tony precinct of the brick palace, and here can be seen burned clay in all the beauty of the molder's and builder's art. But of enameled brick one sees but little. Some years ago a house was built here having its whole front composed of this valuable (for some purposes) material; but the owner of this ornate front found that such brick were not suitable for this work, and had them all taken out. Just why enameled brick would not do for outside work I am unable to say. It is possible that the brick used in the case mentioned were not of good quality.

Although Washington had a splendid "boom" only a few



years ago, and then sank somewhat into a state of apathy, from which it has never fully recovered, and though real estate, building and building material are getting less attention now than usual, it is safe to assume that in all these particulars the future has much in store for the nation's capital. For it is fast becoming the home of the millionaire, who comes and plants a goodly pile of his cash in fine mansions, also distributing his dollars in other directions here; the 21,000 government clerks, feeling more secure under the civil service laws as time goes on, will (a large proportion of them) build homes here; and then it is not impossible that the future will see the Great Falls—situated about fourteen miles from the city—turned into an electric power-maker for running various kinds of factories.

In the meantime the city is making headway slowly. According to the District Commissioners' report, there were issued last year permits for putting up the following structures: 616 brick dwellings, 19 stores, 22 stables, 5 warehouses, 6 churches, 4 office buildings, 6 flats and apartment houses, 2 school houses, 1 gymnasium and 1 market house. These, including a few frame structures, repairs, and three or four unimportant buildings, employed capital to the amount of \$4,102,598.75.

J. E. P.

#### LIMITATION OF HEIGHT OF BUILDINGS IN CHICAGO.

For a long time it has been the wish of many Chicagoans to limit the height of buildings in the Windy City to ten stories and 130 feet. This matter has naturally been the cause of much comment on the part of the papers, and is a matter of deep interest to builders, architects and investors. The subject has been long under discussion. City officials, many of the newspapers and professional reformers have been advocates of the measure restricting heights. The fire departments in all our cities have naturally always been opposed to high buildings. The fire-proof qualities of such structures have been considered of doubtful value by many. However, in view of the insurance rates which have recently been given on buildings of this class by reliable companies, we cannot say that such objections are tenable.

The Chicago Chronicle, speaking of this restrictive ordinance, says:

"That [130 feet] is high enough for buildings in a city like Chicago, for the area of business building sites is practically unlimited, with a level surface and broad streets from all directions. To restrict the height of buildings would tend to prevent a rapid increase in the value of central real estate, especially business corners, but it will tend to equalize real estate values by stimulating higher prices in localities a few blocks away. This view seems to meet the ideas of real estate men. Mr. M. A. Farr says: 'Limitation of the height of sky-scrapers meets my views exactly. I wish there had never been a sky-scraper erected in Chicago. They tend toward the congestion of the business district, and are a detriment in many ways. But there is another side to this question,' he says. 'It puts a premium at once upon poor office buildings. As long as this new law stands there will be no more fine buildings in the city, because it is impossible to construct a luxurious ten-story building that will pay expenses. This ordinance was passed, I believe, in the hope that it would protect business over in the West Side. It would be a great mistake to spread the business district of Chicago. If the protection of life or property was the object of the Council, it should have passed an ordinance prohibiting the construction of any other than fire-proof structures in the center of the city.'"

The Clay-Worker has little interest in the matter so far as the local features go, but it is our opinion that there should be a limit, and that ten stories is a reasonable height, though there may be conditions justifying the erection of taller buildings. As far as the sale of brick is concerned, there might be an increase through such a limitation; the difference, however, is too small to deserve much consideration.



#### *The Flag Goes By.*

*Hats off!*

*Along the street there comes  
A blare of bugles, a ruffle of drums,  
A flash of color beneath the sky;  
Hats off!  
The flag is passing by.*

*Blue and crimson and white it shines,  
Over the steel-tipped ordered lines.  
Hats off!  
The colors before us fly;  
But more than the flag is passing by.*

*Sea fights and land fights, grim and great,  
Fought to make and save the state;  
Weary marches, and sinking ships;  
Cheers of victory on dying lips.*

*Days of plenty and days of peace;  
March of a strong land's swift increase;  
Equal justice, right and law,  
Stately honor and reverend awe.*

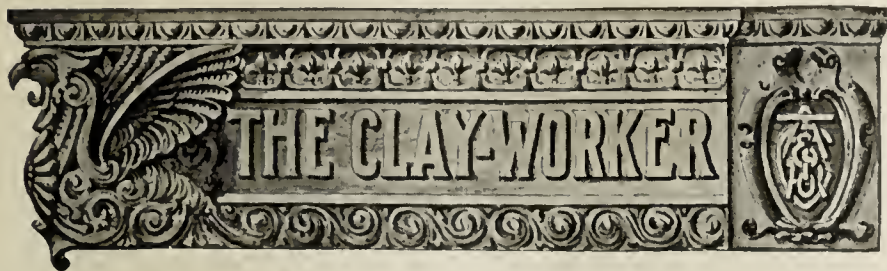
*Sign of a nation, great and strong,  
To ward her people from foreign wrong;  
Pride and glory and honor, all  
Live in the colors to stand or fall.*

*Hats off!*

*Along the street there comes  
A blare of bugles, a ruffle of drums,  
And loyal hearts are beating high;  
Hats off!  
The flag is passing by.*

H. H. Bennett.





Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

### FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to  
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXIX.

MAY, 1898.

No 5.

### CURRENT COMMENT.

We congratulate our readers, as well as Mr. Gates himself, upon his safe escape from the grim monster, which is related in our correspondence columns. We don't want to publish the obituary of the "King of Button-holers" for many years to come, not until his friend Purington is ready to write it some "fifty years hence."

\* \* \*

Two large paving brick plants advertise for foremen in this issue. If those seeking employment will keep an eye on our "Wanted, For Sale, Etc.," columns, they may easily find desirable locations, provided, of course, they are competent and industrious, and can produce good evidence to that effect. The mere say so of the applicant is not sufficient.

\* \* \*

The war is on. The Clay-Worker claims no special endowment for having long ago foreseen and declared that nothing but war could end the unbearable conditions existing on our borders. It is too late in the progress of our Christian civilization to allow such barbarities as have been long practiced in Cuba to continue at our very door. That spirit which is embodied in the laws which create boards of children's guardians, who are to rescue helpless childhood from the neglect and cruelty of inhuman parents, pervades the body politic; hence to rescue the perishing becomes the duty of a Christian nation.

\* \* \*

In its origin and motives this war is unlike any ever waged before. There is in it no motive of aggrandizement, and there are no national wrongs to redress; and yet the nation enters upon it with a unanimity never before known. Only here and there a constitutional churl mutters a dissent. What cares he for the sufferings of others, if only his gross animal nature is unmolested? Even the most captious can discover no hidden selfishness that prompts it. Fifty years ago, when war with Mexico was declared, two-thirds of the people of the North be-

lieved it was a war of conquest, that more territory suited to slavery might be acquired; but no such motive is supposed to exist in this war anywhere, even by the most captious. It is simply a war of humanity, and the people enter upon it with unparalleled unanimity.

\* \* \*

That it will disturb business for a season is inevitable, but it will not so seriously affect any industry as to cripple it materially, unless it shall continue longer than now seems probable. The lavish expenditure of money—estimated at \$3,000,000 a day—will, of course, be felt by those who contribute to public funds, but even then our taxes are relatively insignificant compared with the taxes of any other nation, and they are to be extraordinary for a short period only. The withdrawal of a hundred thousand men, or twice or three times that number, from the productive industries will not be seriously felt in the plethora of the labor market, only that, so far, very few of those who most complain that they can find nothing to do have taken a job, even for the summer, with the Government. Most of those who have enlisted are men who had employment.

\* \* \*

The war will prove disastrous to the tourist industry, as traveling on the ocean is not likely to be up to the average summer, but this may be a godsend to our home resorts. After a few weeks every line of business will resume its wonted channel and proceed as if no war existed. Already a thousand things which took an upward spurt a month ago, under the hope that "war prices" would affect everything as famine prices had affected the price of wheat, have resumed old prices, and business of all kinds, except ocean transportation and army supplies, will remain substantially as if there was no war.

\* \* \*

Of the outcome of the war there can be no doubt. The duration and the details are matters of the future. It is not going to be any ten years' war, or the half of it. We travel across the continent or the ocean in a week now, instead of taking three months, as our fathers did, and we do up war business with like dispatch. And we are not to look for many duplications of the Dewey victory. We will take as well as give, and we need not be surprised at many serious reverses; but the end will be a victory for our arms and a victory for our civilization. Meanwhile, let us stick to our business, and it will stick to us.

### THE BUILDING OUTLOOK.

While it is true that certain building enterprises in the coast cities have been laid by on account of the war, we are not certain, from what we can see, that the war has had a damaging effect upon the brick business in cities removed from the Atlantic coast. Pittsburg, Buffalo, Cleveland and Detroit show great activity. The architects of Chicago have done more business this spring than during the same period within three years past. Many moderate-sized enterprises are being carried forward in St. Louis. Kansas City is showing a revival. There were a few days of hesitancy and question before the battle of Manila. There was a feeling upon the part of many of us that it was possible we had waked the wrong passenger. But since that time there has not only been a change of feeling, but an actual business revival.

### CLAY FIRE-PROOFING.

If one applies a torch to the individual who typifies the insurance sense of the country, he occasionally awakens him. Insurance companies have come to the realization of the fact that all fire-proofing does not fire-proof. Many cheap devices of corrugated metal, wire lath and a minimum of plaster and cement have been used during recent years. It is fire-proofing in name only. Wherever metal is left exposed, or the covering is light, a little sniff of fire knocks it all to pieces. Insurance men are learning from hard experience that the only reliable fire-proofing is burned clay. Where this material has been used



properly, it has proven satisfactory. The insurance organizations, having been severely scorched, are looking into this question. Now will come the inning for clay. The Old Colony and Manhattan buildings stood on either side of a fierce fire caused by the burning of an inflammable six-story structure. Two hundred and eighty-five dollars repaired the damage on the Manhattan. The Old Colony was uninjured. The separation was of fire-proofing.

### “ANY COLOR SO IT’S RED.”

The above expression was quite common some years ago, and applied to building-brick the country over. The situation has now changed greatly. The highest-priced brick on the market now are not red. Those most in demand are not red. Is the demand for the other colors a fad? Time will tell. An architect who has watched this development with some interest, and possibly with some prejudice unfavorable to the uniform red color, has this to say: “The American people are fond of the picturesque, of variety. If you question this, look at the street architecture. Who will question the desire for the picturesque? See the gables, the towers, the irregular sky lines, the irregularity in the form of the porches. Note our commercial architecture, with its variety. Note the changes in color as well as in form. This is a natural characteristic of the people. Red may be used because it is cheap, but not often through choice. If the tan, gray, brown, white and other colors should become dominant, we might expect some to select the red brick for the sake of variety. But otherwise I believe that our people will seek changes, work towards the picturesque, even though it be not always with the best of taste.” The one above quoted speaks of brick as used in the more expensive dwellings and commercial structures. We cannot think, however, that the demand for novelty in color will greatly affect or lessen the demand for the ordinary commercial red brick. They will be used just as extensively a century hence as now.

### ARTISTIC EDUCATION—ITS EFFECT ON ARCHITECTURE

The Ceramic Association of the State of Ohio was fortunate in having presented to it the paper on “The Artistic Education of the Potter,” by Mr. Herman C. Mueller, which we give in full on a preceding page. Primarily, Mr. Mueller is an artist—an artist by education, and an artist by nature, which is more. The clayworkers of this country have not hitherto given serious, independent thought in a broad way to the art side of their product. Art, as related to clay, has been incidental. We have contented ourselves with the imitation of the styles of other times and other nations. An imitation is essentially cheap. Ideas new, ideas useful, ideas natural, when placed in clay, have new and distinct value. Mr. Mueller cites the instance of the Rookwood Pottery, of Cincinnati, which made a sincere, natural effort to develop a style of its own. We all know of its success.

Those who have left the Rookwood Pottery and gone into other sections with the idea of mere imitation have failed. We know of those who have left this institution, with the general knowledge of principles which may be learned through that institution, and have been successful. One, a lady in Wisconsin, has confined her thought and attention to the clay of her own immediate neighborhood, and has developed a beautiful yellow ware, with a beautiful, deep, transparent glaze, with natural decorative forms, which is not allied to color and design or character to the Rookwood work. It is allied to the Rookwood idea through its seriousness and independence. Here is the one path through which art may make progress. It is the one path for American art. It is creation, and not resuscitation.

A few weeks ago, in this city, there was an exhibition of fac-simile prints in colors of a number of the Chinese vases of the Walters collection in Baltimore. The world knows nothing

more beautiful in pottery than these examples. The world knows nothing more wonderful in printing than these color reproductions by Louis Prang. The lesson to be derived from such an exhibition is not the lesson of imitation, but is a lesson in creation. These vases represent the decorative thought, the form thought and color thought of the Chinese nation. The war thought, the engineering thought, the thought which makes great steamships and railways, does not belong to the Chinese nation. They have expended themselves in art thought, as we have expended ourselves in the more material thought of our time.

The writer had a talk, some months ago, with Mr. Mueller, and he expressed the thought that it is now possible to erect polychrome structures of artistic design and render them permanent through the medium of the potter’s art. No serious or well-directed effort has ever been made in this direction. It is our hope that it will not be made except in the hands of one of the practical and artistic training which belongs to the author of this paper. Nothing degrades public taste so much as pretentious, bad art. Nothing elevates it so much as real art. A great commercial structure, a front in color, may be a thing of beauty or intense ugliness. In any case, it will be imitated by the public. No difference whether the result be good or bad, the idea will have its reproducers.

### TRADE LITERATURE.

CLAY SCREENS and Separators have come into common use on modern brick plants. Those made by the Pittsburgh, (Pa.) Mineral Screen Co., (see ad. on page 460) are adapted to all sorts of minerals, such as shales, coal, stone, cements, rock salt, lime, potash, etc., etc. The company has a neat thirty-page catalogue illustrating and telling all about them, and will gladly mail a copy to any of our readers sufficiently interested to drop them a postal.

CLAYWORKING MACHINERY of the “Leader” sort, is the title of a business-like appearing little book issued by the Leader Mfg. Co., Decatur, Ill. It contains considerable information of interest to brick and tile makers, in addition to the usual cuts and descriptions of stiff clay machinery, cut-off tables, represses, crushers, elevators, dump cars, brick barrows, tile trucks, etc., etc. A copy can be had for the asking.

PORTABLE CONTINUOUS KILNS may seem to some of our readers, who are only familiar with the old-time, massive structures that are as permanent as the hills, as something visionary, but if they will write F. Lehman & Co., foot of West Wellington St., Chicago, for a copy of their new catalogue describing their improved kiln, they will be put in possession of facts and figures that will be a revelation to them. This kiln, see cut of page 468, is adapted to all kinds of fuel, and especially for crude oil.

THE FUEL QUESTION is a serious one to brick and tile manufacturers. The U. S. Rocking Grate Bar Co., 225 Dearborn St., Chicago, offer a device which users have found reduces the fuel bills very materially. To convince those unacquainted with their system they have issued a six-page pamphlet, giving the testimony of the reputed best-known expert on combustion. There is a suggestion of warmth in the illustrations that will convince even the casual observer that the expert knows his business and speaks from experience, not mere theory. A copy will be mailed free to any of the Clay-Worker’s readers.

STEEL BRICK DRYER CARS are now preferred by many of the largest clayworkers because they have proven more durable than old style cars. The Atlas Bolt and Screw Co., Cleveland, Ohio, manufacture all kinds of ball-bearing steel cars for brick and tile factories, including transfer cars, single and double deck cars, with or without perforated bottoms for stiff mud brick, and rack cars for soft mud brick, wood or steel bodied dump cars, and a full line of steel wheel barrows, all of which, and more, are illustrated in a mammoth hanger, with which they would like to decorate the wall of every clay-



worker's office in the land. If you haven't already received a copy, write them, mentioning the Clay-Worker, and it will be mailed at once.

THE AMERICAN POTTERY GAZETTE is the title of a new and attractive monthly magazine published at East Liverpool, Ohio. As the name indicates, the Gazette will be devoted to the pottery and glassware interests. The field is large and rich, and the publishers are evidently familiar with it. The prestige of the home industries, which are vast—East Liverpool being one of the chief pottery centers of America—will prove of decided advantage, and as the matter and makeup of the paper is excellent, it will no doubt prove a profitable venture. We wish the Gazette a long life of usefulness and success.

### TRADE NOTES.

The Standard Dry Kiln Co., Indianapolis, Ind., report a satisfactory trade, notwithstanding the war fever which rages fiercely at the Hoosier capital, where four thousand volunteers have assembled and will soon be mustered into Uncle Sam's service.

The Fernholtz Brick Press Co., St. Louis, write that their business continues good. Among recent sales they mention that of a complete outfit, including a six-mold press, to Ketelster & Degetau, Chihuahua, Mexico, and a press to the Superior Press Brick Co., St. Louis, and M. Butler, Houston, Texas.

The Central Machine Works, Cleveland, Ohio, have recently booked orders for three of their "J. N. K." brick machines, which they are confident will result in further orders from the same localities, as soon as the merits of the machine, which is illustrated on page 478, is fully appreciated.

### HAD NOTHING TO SAY.

[With apologies to J. W. R.]

You want to be a soldier, Jim? Well, I don't blame you, lad. The fever that has hit you now once monkeyed with your dad. I know exactly how you feel, you're achin' fur a scrap, An' want to go an' help to wipe ol' Spain clean off the map. When I was young an' full o' nerve in eighteen sixty-one, I wasn't half content till I was coupled to a gun; An' now that you're a-feelin' in that same ol' hostile way, An' want to emulate your dad, I've not a word to say.

I hope you've reckoned up the cost, an' counted it up well, Fur war, as Gen'ral Sherman said, ain't fur removed from hell! You'll find it ain't no picnic, Jim; you'll soon find out that you Won't have a bit o' nerve too much in pullin' of you through. It ain't no circus-day affair when shells begin to bust, An' comrades lay in blood an' pain a-writhin' in the dust, An' bullets, jes' like maddened bees, zip past in fiendish way, But if you have a mind to go, I've not a word to say.

I guess yer mother won't object; I heerd her say last night She wished she only was a man so she could go an' fight. 'T'll be an orful trial, though, fur her to see ye start, An' one that's mighty apt to break her pore old mother's heart. Jes' tell her in a manly way that you are bound to go, That you're true blood American from top clean down to toe, An' if she asks you what I think, jes' tell her that's O K. That we have had a talk an' I have nothin' more to say.

I want to tell you, honest, boy, that this ain't no surprise; I've seen the sparks of loyal pride a-dancin' in your eyes, An' I've been waitin' fur a week to hear you make your talk, An' show your daddy that you come of good ol' fightin' stock. An' now, to close the matter up, I'll tell you, further, Jim, Your daddy would have knocked you out or you'd 'a' walloped him, If, when you'd heard your country call, you'd made a coward play— I'm proud o' you! God bless you, boy! That's all I've got to say!

—[Frank Tarkington Baker.

## TABLE OF CONTENTS.

|                                                                             |     |                                                      |     |
|-----------------------------------------------------------------------------|-----|------------------------------------------------------|-----|
| A Brick Fence.....                                                          | 403 | The Good News Confirmed.....                         | 426 |
| Red Press Brick .....                                                       | 404 | Congratulations From a Fellow-Sufferer.....          | 426 |
| In Philadelphia Brickyards—                                                 |     | Sunshine and Shadow.....                             | 426 |
| Around the Small Yards.....                                                 | 405 | A Terra Cotta Man's Hopes and Fears.....             | 426 |
| A New Explosive Especially Adapted to Clay Blasting.....                    | 405 | Wants His Buttonhole.....                            | 426 |
| Philadelphia's Oldest Clay-Working Establishment .....                      | 406 | What is a Fair Royalty?.....                         | 426 |
| The Ceramic Association of the Ohio State University.....                   | 406 | A Brickmaker Builds a Frame House .....              | 427 |
| Hints on Brickmaking .....                                                  | 407 | Information Through Private Correspondence.....      | 427 |
| The Development of Hollow Block Manufacture.....                            | 408 | Remedy for Cracking Brick....                        | 428 |
| Good and Bad Brick Work.....                                                | 410 | Profiting by Experience.....                         | 428 |
| The Artistic Education of the Potter .....                                  | 411 | Continuous Kilns and the Convention.....             | 428 |
| Modern American Front Brick                                                 | 414 | Wants it Oftener.....                                | 429 |
| A Buckeye Brick and Tile Plant .....                                        | 415 | The New York Market.....                             | 429 |
| Terra Cotta in Architecture....                                             | 416 | Now for the Next One .....                           | 429 |
| Spring Meeting of the National Stove Lining Manufacturers' Association..... | 418 | Tidewater Notes.....                                 | 450 |
| The Art School at Trenton, N. J.                                            | 419 | Pacific Coast News .....                             | 454 |
| Obituary, F. D. Cummer.....                                                 | 419 |                                                      |     |
| Anglo-American Pottery.....                                                 | 420 | <b>EDITORIAL:</b>                                    |     |
| Well-Deserved Success .....                                                 | 424 | Current Comment.....                                 | 433 |
| A New Brick-Cutting Table....                                               | 425 | The Building Outlook.....                            | 433 |
| The Drain Tile Business Prospering .....                                    | 425 | Clay Fire-Proofing .....                             | 433 |
| A Seashore Brick Plant .....                                                | 429 | "Any Color so It's Red".....                         | 434 |
| What's a Fair Royalty?.....                                                 | 430 | Artistic Education—Its Effects on Architecture ..... | 434 |
| Brick and Business in the District of Columbia.....                         | 431 | Trade Literature.....                                | 434 |
| Limitation of Height of Buildings in Chicago.....                           | 432 | Trade Notes.....                                     | 435 |
| The Use and Abuse of Clay-working Machinery.....                            | 450 | Editorial Notes and Clippings.                       | 452 |
| <b>CORRESPONDENCE:</b>                                                      |     | <b>MISCELLANY:</b>                                   |     |
| In Troubled Waters.....                                                     | 426 | Old John .....                                       | 413 |
|                                                                             |     | How to Make a Fortune.....                           | 418 |
|                                                                             |     | Let in a Little Sunlight .....                       | 424 |
|                                                                             |     | The Flag Goes By .....                               | 432 |
|                                                                             |     | Had Nothing to Say .....                             | 435 |
|                                                                             |     | Evidence of Better Times .....                       | 454 |

### Index to Advertisements on Next Page.

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**FOR SALE**—A \$20,000 brick and tile factory, at Carlinville, Ill.; with inexhaustible hill of shale clay. For sale at \$5,000 on easy payments; or will rent for term of years. Free of rent this year, to proper parties. 45p e CASH & LUCKEL, Galveston, Texas.

**FOR SALE**—5,400 white pine pallets, 33¼ inches long, 10 inches wide, tops of four pieces ⅞-inch thick, with three cleats 1½ x ⅞-inch nailed on with wire nails, entirely new and first class. Will be sold cheap if ordered at once. W. B. MERSHON & CO., Saginaw, Mich.

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**T. A. RANDALL & CO.,**  
Indianapolis, Ind.



## INDEX TO ADVERTISERS.

## Brick Machinery—Dry Press Process.

| Name.                              | Page.    | Name.                                        | Page.    |
|------------------------------------|----------|----------------------------------------------|----------|
| Simpson Brick Press Co .....       | 400      | The American Clay-Working Machinery Co ..... | 456, 474 |
| The Chisholm, Boyd & White Co..... | 396, 397 | The Fernholtz Brick Press Co..               | 398      |

## Brick and Tile Machinery.

|                                       |               |                                                 |          |
|---------------------------------------|---------------|-------------------------------------------------|----------|
| Anderson Foundry and Mach. Works..... | 472           | Steele, J. C., & Son.....                       | 466      |
| Baird and Son, H. C.....              | 464           | Fate & Co., J. D.....                           | 479      |
| Brewer, H. & Co .....                 | 481           | The Huetteman & Cramer Co...                    | 470      |
| Carlin's Sons, Thomas .....           | 458           | The American Clay-Working Machinery Co.....     | 456, 474 |
| Central Machine Works .....           | 478           | The Horton Mfg Co .....                         | 473      |
| Chambers Brothers Co.....             | 393, 471      | The Eastern Machinery Co....                    | 482      |
| Chicago Brick Machinery Co...         | 399           | The Henry Martin Brick Mach. Mfg. Co .....      | 462, 476 |
| Freese, E. M. & Co .....              | 480           | The Leader Mfg. Co.....                         | 471      |
| Frost Engine Co .....                 | 401           | The Ohio Ceramic Engineering Co .....           | 394      |
| Hensley, J. W.....                    | 395           | The Wallace Mfg. Co.....                        | 455, 483 |
| Kells & Sons .....                    | 464           | The Wellington Machine Co....                   | 453      |
| Means & Co., Jas.....                 | 462           | Williams Patent Crusher and Pulverizer Co ..... | 457      |
| Madden & Co.....                      | 465           | Wiles Co., A. M. & W. H .....                   | 466      |
| Murray & Welch .....                  | 460           | Woolley Foundry and Machine Works .....         | 475      |
| Potts & Co., C. & A.....              | 394, 348, 477 |                                                 |          |
| Raymond & Co., C. W .....             | 449, 451      |                                                 |          |
| Stedman's Machine Works.....          | 466           |                                                 |          |

## Brick Kilns and Dryers.

|                            |     |                                |     |
|----------------------------|-----|--------------------------------|-----|
| Alsip, S. H .....          | 467 | Phillips, S. G.....            | 464 |
| Carson, J. W.....          | 461 | Reppell, L. H .....            | 467 |
| Eudaly, W. A .....         | 469 | Swift, F. E.....               | 460 |
| Haigh, H.....              | 468 | The American Blower Co.....    | 484 |
| Kaul, C. F.....            | 461 | The Fernholtz Brick Press Co.. | 398 |
| Lehmann & Co, F.....       | 468 | The Standard Dry Kiln Co.....  | 402 |
| Morrison & Co., R. B ..... | 469 | Wolff Dryer Co.....            | 484 |
| Pike, E. M.....            | 461 | Yates, Alfred.....             | 461 |

## Brick Yard Supplies.

|                               |     |                                              |          |
|-------------------------------|-----|----------------------------------------------|----------|
| Arnold, D. J. C.....          | 472 | Phillips & McLaren .....                     | 462      |
| Coldewe & Co., G.....         | 462 | The Atlas Bolt & Screw Co.....               | 458      |
| Carnell, Geo.....             | 467 | The Harrington & King Perforating Co .....   | 395      |
| Caldwell & Son Co., H. W..... | 463 | The Henry Martin Brick Machine Mfg. Co ..... | 462, 476 |
| Carmichael, T. W.....         | 462 | The Horton Mfg. Co.....                      | 473      |
| Elder & Dunlap.....           | 459 | The Pittsburg Mineral Screen Company.....    | 460      |
| Marion Steam Shovel Co.....   | 470 |                                              |          |
| Mey, F. H. C.....             | 459 |                                              |          |
| Mershon & Co., W. B .....     | 458 |                                              |          |
| Newton, A. H.....             | 465 |                                              |          |

## Miscellaneous.

|                                            |     |                                      |     |
|--------------------------------------------|-----|--------------------------------------|-----|
| Associated Trade & Industrial Press .....  | 462 | Indianapolis School of Medicine..... | 462 |
| Bennett & Sayer.....                       | 459 | Indiana, Decatur & Western ...       | 464 |
| Big Four R. R.....                         | 465 | Illinois Central R. R .....          | 464 |
| Cincinnati, Hamilton & Dayton R. R .....   | 463 | Kendall & Flick .....                | 460 |
| Chesapeake & Ohio R. R.....                | 465 | Lake Eric & Western.....             | 465 |
| Cotton Belt Route.....                     | 465 | Main Belting Co .....                | 463 |
| Dean Bros. Steam Pump Works                | 457 | Monon Route .....                    | 463 |
| Dover Fire Brick Co.....                   | 463 | Osborne, W. R.....                   | 461 |
| Evens & Howard .....                       | 459 | Sorge, A. Jr.,.....                  | 460 |
| Gabriel & Schall.....                      | 461 | Tennille, A. F.....                  | 460 |
| Geysbeek, S.....                           | 457 | The Jeffrey Manufacturing Co..       | 465 |
| Indianapolis College of Law ...            | 460 | The Roekwood Mfg. Co .....           | 463 |
| Indianapolis Engraving and Electro Co..... | 463 | Vandalia Line .....                  | 464 |
|                                            |     | Small Ads., Wanted, For Sale, etc.   |     |

Mention the Clay-Worker

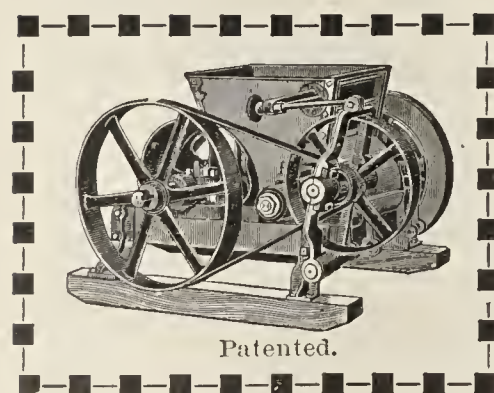
WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

## The Potts Disintegrators

Simple in Construction, Strong and Durable.

Work any clay direct from bank. They will not choke or clog. They grind the small stone and separate the large ones.



Milledgeville, Ga., November 4, 1897.

C. &amp; A. POTTS &amp; CO., Indianapolis, Ind.

Gentlemen:—For ten year I used one of your old style Disintegrators, it did good work early this year I had it changed to the way you now make them and it is simply perfect. My son uses one of your Disintegrators and without it he could not make first-class brick out of the clay he has to use. Every brickmaker who has hard clay to work should put in one of your Disintegrators, it does all you claim for it.

Wishing you much success I am

Yours truly,

J. W. McMILLAN.

We manufacture 12 sizes of Disintegrators and can furnish any size promptly. We guarantee them to do as claimed or no sale.

Write for prices and terms.

C. &amp; A. POTTS &amp; CO., Indianapolis, Ind.





**SIX  
MONTHS  
RECORD**

+ OF THE +

**VICTOR  
RE-PRESS**

**V**ictor

Ontario Paving Brick Co., Toronto, Canada, use two  
McAvoy Vitriified Brick Co., Perkiomen Junction, Pa., use one.  
American Clay M'f'g Co., Pittsburgh, Pa., use one.

**I**s

Clarksburg High Grade Shale Brick Co., Clarksburg, W. Va., use one.  
Reese, Hammond & Co., Bolivar, Pa., use two.  
Welch, Gloninger & Co., Vanport, Pa., use one.

**C**ertainly

Kensington Brick Co., Pittsburgh, Pa., use two.  
Edenburg Brick Co., Edenburg, Pa., use one.  
J. W. Minor, Thomas, Ala., use one.

**T**he

Excelsior Brick Co., Montgomery, Ala., use one.  
Mack M'f'g Co., New Cumberland, W. Va., use two.  
H. Duval & Co., Kingston, Jamaica, use two.

**O**nly

Queen City Brick and Tile Co., Cumberland, Md., use one.  
Douglass-Whistler Brick Co., Vanport Pa., use one  
W. R. Meredith & Bro., Punxsutawney, Pa., use one

**R**e-Press

TWENTY OF THESE POPULAR  
RE-PRESSES SOLD AND  
PLACED IN SUCCESSFUL OP-  
ERATION DURING THAT TIME.

**C.W. RAYMOND & CO.**

DAYTON, OHIO.



Written for the CLAY-WORKER.

## THE USE AND ABUSE OF CLAYWORKING MACHINERY.

### Third Paper.



CONTINUING THE SUBJECT on clay-working machinery used for digging, we will give a brief description of the construction and use of the steam dredging machine. These are nearly always used for deepening waterways, lakes and harbors. The use for gaining clay for the brickmaker solely is not its object. It has been found, however, that in the pursuit of its application in its aquatic delving good brick clay is often brought to the surface. This had to be disposed of, as well as the other less useful material, often proving a costly operation when it had to be transported far away. Happily, in a number of instances the brickmakers came to the rescue and relieved the dredges of securing a dumping place by having the loaded scows brought along the brick factory, and put the clay to a much better use.

The dredge is a much more ponderous machine than the steam shovel, and of much greater capacity. A special boat carries the mechanical arrangement for loosening the clay below the water and bringing it to the surface. The dredge differs from the steam shovel by having a series of self-emptying scoops attached to an endless chain, so arranged that it can be adjusted to the different depths required. As the scoops turn over at the higher point the clay is emptied on a scow near it, or on a long belt carrier which reaches to the shore.

As this machine does not belong to the brick industry specially, we shall not go further into its merits; neither will we dwell long on the mining machines, which are either driven by electric, pneumatic or steam power. These machines are of various constructions, and their duty is to undermine the hard clay so that it can be wedged down or blasted off by means of explosives. One variety of these machines is placed upon a plank, upon which the operator sits and directs its working, the cutting chisel impinging against the hard shale or fire clay. The chisel is a long bar of tool steel, sharpened at the end, which, through the operation of a reciprocating piston at the other end, strikes heavy blows forward until a sufficient depth is secured under it, which enables it to be brought down, after the machine is drawn back out of the way. The medium to convey power, or so-called kinetic energy, for operating this class of machines is generally air. While electricity can be easier conveyed, air is preferred, inasmuch as it ventilates the mine by expanding air exhausted. To obtain the air in its compressed state, an air-compressing plant is erected outside of the mine, from which it is conducted by means of pipes to the place of operation. Most of the other classes of mining machines act on temporary rail tracks, upon which they make their approach towards the clay deposits.

The three best known machines of this character have either a number of boring tools in front, or a revolving shaft, with cutting tools, placed transversely before it. The remaining one being similar to the first described, excepting that it carries more than one chisel, and, as intimated, rests on rails. These machines, as is well understood, are used largely in coal mines, where they are made to dig the so-called fire clay from in under the coal. When the mines are otherwise well ventilated, electricity is probably the simplest and cheapest means for the propelling power of these excavating tools. Intelligent men and careful operators are the only means for the prevention of abuse which could find entrance into the mine along with their appliance in many ways too numerous to mention. Special education and conscientious supervision will always bring success in this branch, as well as it does in things general.

This would evidently end the chapter on clay digging in its most prominent mechanical features. We, however, have seen and will give a short description of a clay-scraping and loading arrangement attached to a specially constructed wagon operated by horse-power. This brings us close to another similar constructed device called a grading machine, which also loosens and loads clay, gravel and soil automatically.

The first-mentioned was driven over the clay deposit, which proved a large, level place. The clay was not loose enough for the machine to take it up with the scraping-knife attached,

hence the ground was first plowed up and even harrowed. This put it in good shape to be elevated, and almost fine enough to pass over the screens for the semi-dry process. The elevator was an endless apron with slats across, and was driven by a chain from the rear wheels of the wagon. In fact, it was similar in operation to the now well-known hay-loading wagons, and driven by only one strong team of horses.

The grading machine is used for railroad or canal digging, or other grading work. As it often goes through good clay deposits, and loads automatically into wagons, it behooves us to also bring it into notice here. The machine, as now constructed, is operated by twelve horses, six in front and six behind the machine. To a strong framework is attached an immense plow, which is easily adjusted to its work by a man riding on top of the machine. The clay, as it is plowed up, drops onto an elevator, which drops it into accompanying wagons, which, when full, can be driven anywhere, even to a brick factory. When the writer first beheld this machine throwing up the clay in such profusion and depositing it into wagons, the adaptability for securing brick clay on level places for brickmaking became evident. For this purpose a traction engine would be the most serviceable and simple. Horses are used for railroad grading, because the machine has often to grade only short stretches, which necessitates its crossing over heavy grades on the track often, which horses seem to do better than a traction engine. For clay digging alone this difficulty would be avoided; hence a traction engine could be used to advantage.

### TIDEWATER NOTES.

E. W. Face & Son, of Norfolk, have bought ten acres of land one mile below Suffolk on the Nansemond river, to run clay from to their new yard in Norfolk. They have a vein of very fine clay from twelve to eighteen feet deep.

H. L. Jacobs has just closed a contract with Batchelder & Collins, of Norfolk, to furnish 1,500,000 brick.

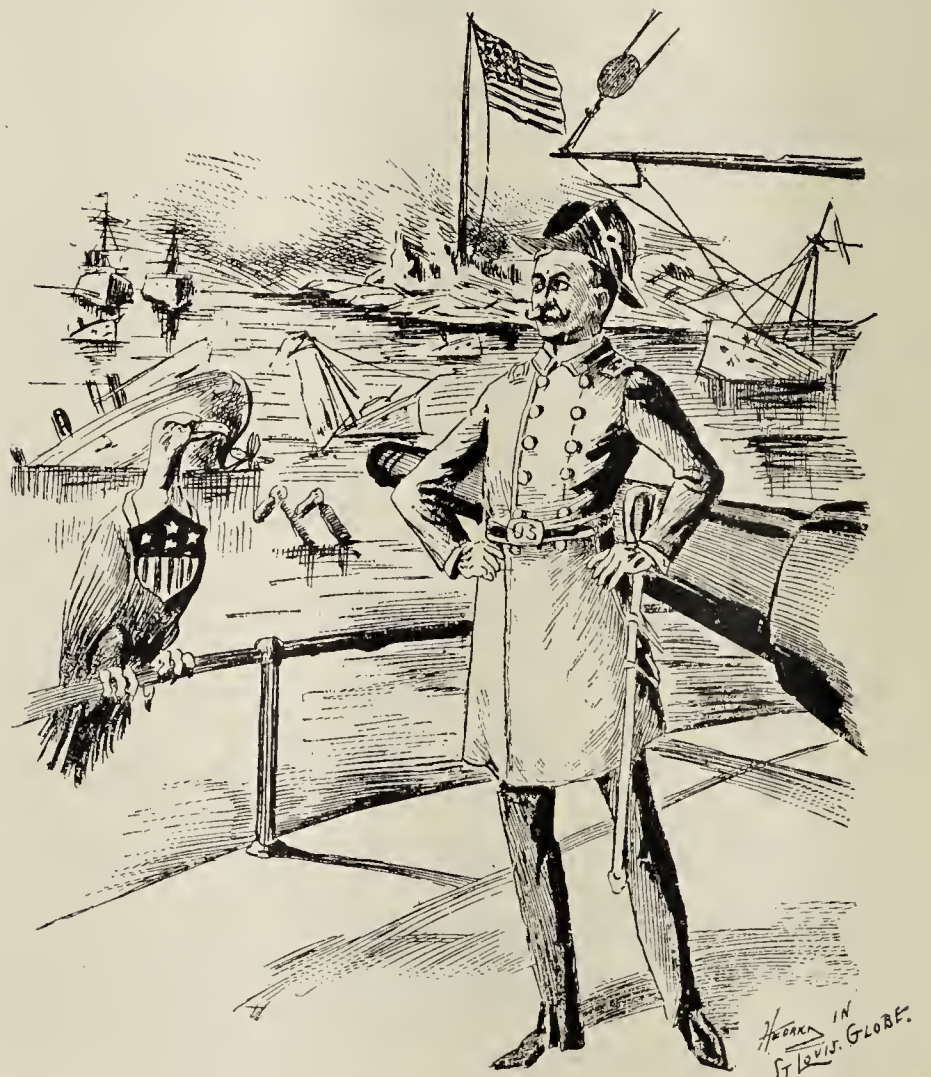
This section has just experienced another severe coast storm which lasted nearly three days, doing great damage. Many of the summer yards lost a big lot of brick in racks or hacks. Among them were the D. C. Harrell & Co. brick works and A. C. Larson. Many others were damaged by the high tides.

Mr. Charles Parker, of Franklin, has leased the Jackson Brick Company's yard, and will run it to its full capacity this year, making side and end-cut brick.

Suffolk, Va.

H. L. JACOBS.

### THE EAGLE TO THE ADMIRAL—"AND THEY NEVER TOUCHED US."







of this famous machinery sold and placed in successful  
operation during that time.

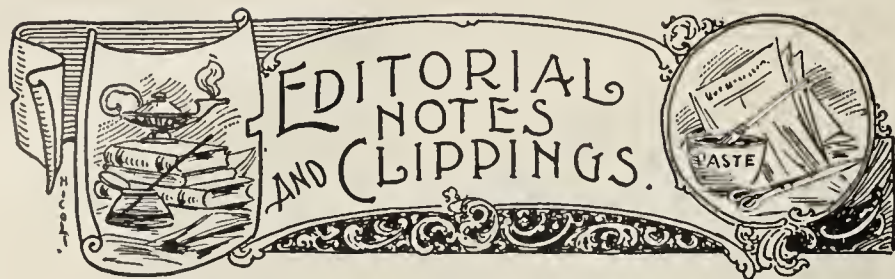
- Augusta, Ga. Outfit, 50,000 brick per day, with Automatic Cutter.
- Bolivar, Pa. Complete Plant, 50,000 brick per day, with Automatic Cutter and Re-presses.
- Toronto, Canada. Outfit, 50,000 brick per day, with Re-presses and Automatic Cutter.
- Opelousas, La. Complete Plant, 30,000 brick per day.
- Kingston, Jamaica. Complete Plant, 30,000 brick per day with Re-presses.
- Lewiston, Pa. Outfit, 30,000 brick per day.
- Cumberland, Md. Complete Plant, 40,000 brick per day, with Re-press.
- Vanport, Pa. No. 1. Outfit, 50,000 brick per day, with Re-press and Automatic Cutter.  
No. 2. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Doniphan, Mo. Outfit, 30,000 brick per day.
- Punxsutawney, Pa. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Cassadaga, N. Y. Outfit, 30,000 per day.
- Sieglingville, S. C. Outfit, 25,000 per day.
- Thomas, Alabama. Complete Plant, 50,000 per day, with Re-press and Automatic Cutter.
- Pittsburgh, Pa. No. 1. Outfit, 50,000 per day with Re-presses and Automatic Cutter.  
No. 2. Outfit, 50,000 per day, with Re-press and Automatic Cutter.
- Edenberg, Pa. Complete Plant, 30,000 per day, with Re-press.
- Mexico City, Mexico. No. 1. Outfit, 30,000 per day.  
No. 2. Complete Plant, 50,000 per day, with Automatic Cutter.
- Abbeyville, Ga. Outfit, 25,000 per day.

COULD A BETTER - - -  
TESTIMONIAL BE OFFERED?



C. W. RAYMOND & CO., DAYTON, OHIO.





E. P. Meyer will open up a brickyard at Rockwell, City, Ia.

C. E. Phillips will open a brickyard at Big Stone City, S. D.

R. H. Montgomery has purchased the Wagner brickyard, near Lewistown, Pa.

J. W. Hartwell and others contemplate starting a brick plant at Twin Bridges, Mont.

A. J. Easum & Co. will establish an up-to-date steam brick plant at Colfax, Wash.

A. O. Morgan, of Burlingame, Kan., will open up a brickyard at Roswell, N. M.

Henry Bird and Fred Keck, of Northport, Wash., will start a brickyard on a small scale.

C. Ruffner will manufacture brick at Blandsburg, Cambria county, Pa., the coming season.

Adam Ritger has purchased the Brooks brickyard at Williamsburg, Va., and will operate same at once.

Theodore Lydecker expects to go into the drain tile business at Greenwich, a little place near Kankakee, Ill.

An immense pottery, in which East Liverpool, Ohio, men are interested, will be established at Brazil, Ind.

After being idle since August, 1896, the Millington (Ill.) Tile Company will start their factory in a short time.

A. D. Rowe is making changes in his brickyard at South Eliot, Me., by which it will be run by steam power.

F. Powell has purchased the interest of F. Goodwin in the brick business at Gilbert's Mill, Paulding county, Ohio.

George W. Jackson will build a factory at Colorado Springs, Col., for the manufacture of terra cotta and sewer pipe.

Harwood Bros., of Richmond, Va., have purchased the brickyard at Petersburg, Va., formerly operated by G. W. Lambert.

A small fire occurred at the brickyard of McCleaster Bros., Harrisburg, Pa., May 9th, which resulted in a five-hundred-dollar loss.

We are advised that W. C. Bolster, of Princeton, Mo., will establish a brick plant, and would like to receive catalogues of machinery, etc.

A company has been organized at Warren, Ohio, for the purpose of manufacturing brick. W. M. Brewer is at the head of the enterprise.

The clay pipe factory of John Much, at Syracuse, N. Y., was damaged to the extent of \$2,500 by fire May 3d. Mr. Much will probably rebuild.

J. Edson Clapp, Vicksburg, Mich., writes that his firm (Clapp Bros.) is very busy, running a sawmill, making brick, and building a Morrison improved kiln.

David Davidson, a well-known brick manufacturer and contractor of Saratoga, N. Y., passed away rather suddenly at his home in that city April 27th.

The works of the Mound City Brick Company, at Moundsville, W. Va., were slightly damaged by fire April 29th. Loss is fully covered by insurance.

J. C. Reinhold is fitting up a brick plant at Palestine, Ill., with improved machinery, and expects to be turning out a superior quality of brick in a short time.

The Edensburg Brick Company has been incorporated at Pittsburg, Pa., by William M. Crafton, Henry J. Orth and others. They have a capital stock of \$7,000.

A new brick and tile plant has been started at Rantoul, Ill., to be operated by Meneley, Lafolette & Miller. Mr. Miller is to establish a brick plant at Guide Rock, Neb.

William Hughes, an employe of the Ohio Mining and Manufacturing Company, at Shawnee, Ohio, was struck by a falling piece of clay weighing five tons and instantly killed.

Arrangements are being made to reorganize the Schmohl-Miller Brick Company, at Weatherly, Pa., and the old plant will be opened up and operated to its utmost capacity.

W. P. Alsip, of Grand Forks, N. D., will manufacture brick at Winnipeg, Manitoba, where he will erect a plant, which he will operate in connection with the yard at Grand Forks.

Joseph J. Robinson, for a long time at the head of the firm of G. W. Robinson & Son, brick manufacturers of Baltimore, Md., died suddenly of heart disease in that city the 1st inst.

A firm to manufacture pottery has been formed at Trenton N. J., by James E. Norris, F. S. Jones and C. D. Jones. The firm name will be James E. Norris. The capital stock is \$30,000.

The Chicago Terra Cotta Roofing and Siding Tile Company advise us that they are enlarging their plant at Ottawa, Ill., and will build a new dryer, and would like to receive dryer catalogues, etc.

Damage to the extent of \$500 was sustained at the immense plant of the Hydraulic Press Brick Company, at Cheltenham, St. Louis, Mo., from a fire which threatened for a time to destroy the entire plant.

N. Kastler has leased the Amboy (Ill.) tile plant. As Mr. Kastner is experienced in the work, there is no question as to his success. He announces he will purchase the plant at the expiration of his lease.

John J. Epley, the well-known brick manufacturer of Denver, Col., died at his home, on Howard street, Colfax, a suburb of Denver. Mr. Epley was sixty-two years old, and had spent the better part of his life in and about Denver.

The Dutchess Brick Company, of Matteawan, N. Y., has been incorporated by G. H. Bontecon, William D. Budd and N. Covert, of Dutchess Junction, and D. B. Ryan, Jersey City, N. J. They have a capital stock of \$300,000.

Ground has been broken at Crookston, Minn., for the large brick works to be established there by Mr. Kronschnabel. The work on the plant is to be pushed as rapidly as possible, and they hope to be manufacturing brick in a short time.

The Riverside Brick Company are making extensive improvements in their plant at De Pere, Wis., which, when completed, will make it one of the finest plants in that part of the State. Among other things, they are putting up a new Ironclad dryer.

The Eastern Machinery Company, New Haven, Conn., write that while trade is not so brisk as it might be, they can report the sale of two machines recently, one to the Kichline Brick Company, Allentown, Pa., and another to M. W. Sands, of North Cambridge, Mass.

On the evening of May 7th fire was discovered in the barn of the Glens Falls (N. Y.) Terra Cotta Company, and before the fire department could get to the place the barn, with all its contents, was completely destroyed. The loss is \$700, partly covered by insurance.

Gretna, Neb., is to have a new brickyard, which will be operated by Thomas W. Langdon and M. and E. Bridges. Mr. Langdon will furnish the financial backing for the enterprise, while Messrs. Bridges, who are practical brickmakers, will have charge of the operative feature of the business.

The Rathbun Terra Cotta Company's plant at Deseronto, Ontario, was almost completely destroyed by fire April 30th. The fire started in the boiler room, and made such rapid progress that in a short time all the main buildings were in flames. The loss is placed at \$100,000, which is partly covered by insurance.

The Indianapolis (Ind.) Terra Cotta Works are very busy at present, running to their full capacity. They say they have orders on hand now sufficient to keep them going for three months and this, too, at prices better than last year. They are making shipments to Cleveland, Toledo, Detroit, Cincinnati, Louisville and Memphis.

At a recent meeting of the stockholders of the Vulcan Clay Company, at East Liverpool, Ohio, the following directors were elected: P. M. Smith, J. S. McNutt, W. E. Smith, W. Snediker and Charles M. McKeehan. At the same meeting P. Bruner, Superintendent of the works, resigned, but no one was selected to fill his place.

The large flower-pot manufactory of the Pittsburg Clay Manufacturing Company at New Brighton, Pa., was burned to the ground May 3d. There was a large amount of finished work on hand, which was ruined, and this, together with the other loss, amounts to \$15,000, which is only partly covered by insurance. The plant will in all probability be rebuilt in the near future.

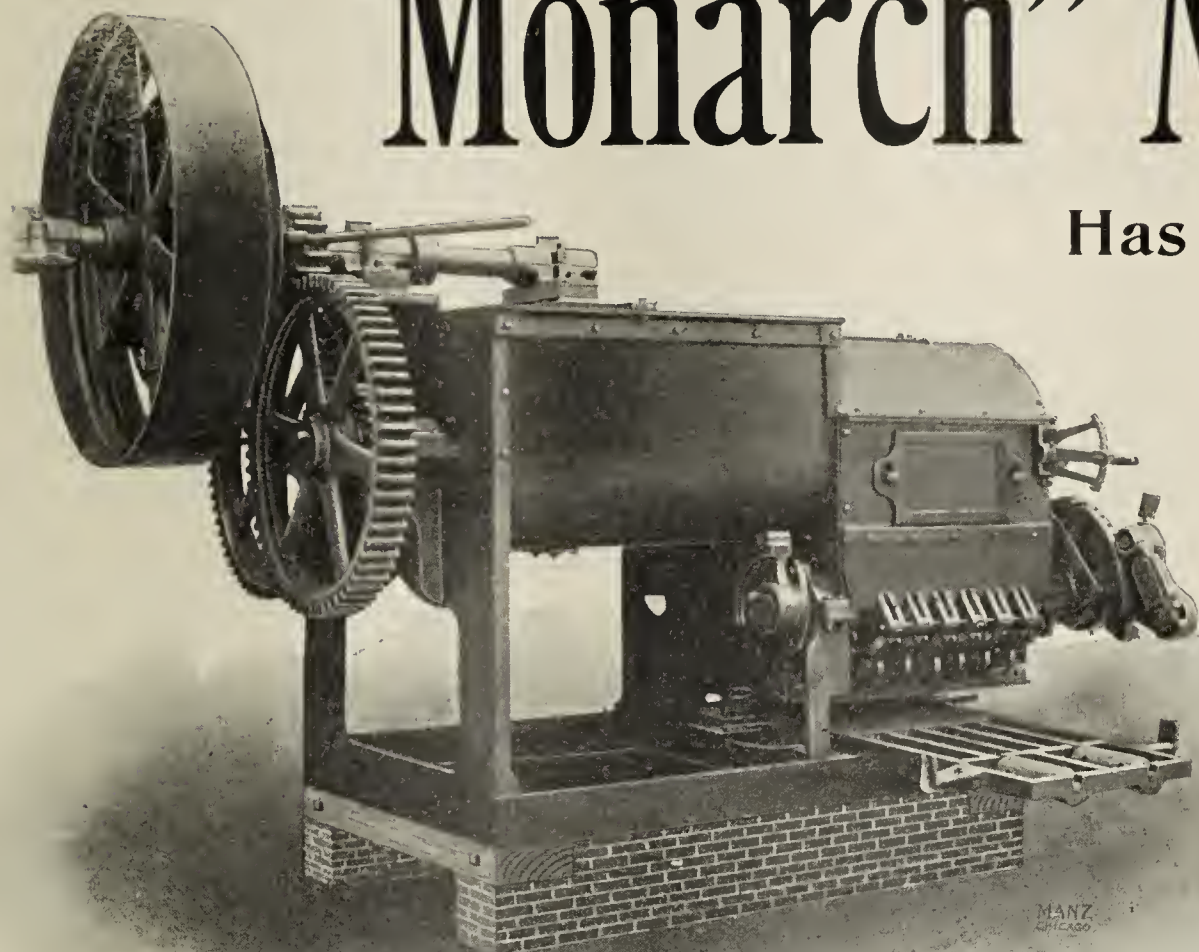
Strikes are usually in order this time of the year, and the brick manufacturers of Hackensack, N. J., are having their share of trouble with the strikers. A large number of the men employed at the different yards struck for higher wages, and, not content with this, interfered with men at work at other yards. Rioting followed, and the sheriff had to be called out.

[CONTINUED ON PAGE 454.]



FOUR STYLES OF.....

# "Monarch" Machines



Has Double Pug Mills,

Giving the most tempering capacity of any Machine made.

Double Presses

Giving the most pressing capacity of any machine made.

Presses

Are "all in the mud," thereby eliminating all unnecessary friction and wear.



These and other MOST IMPORTANT points which are

IN NO OTHER.

## The "Iron Quaker" Machines

For 1898 are BETTER THAN EVER.

This cut shows the steam power in connection with our Mould Sander.

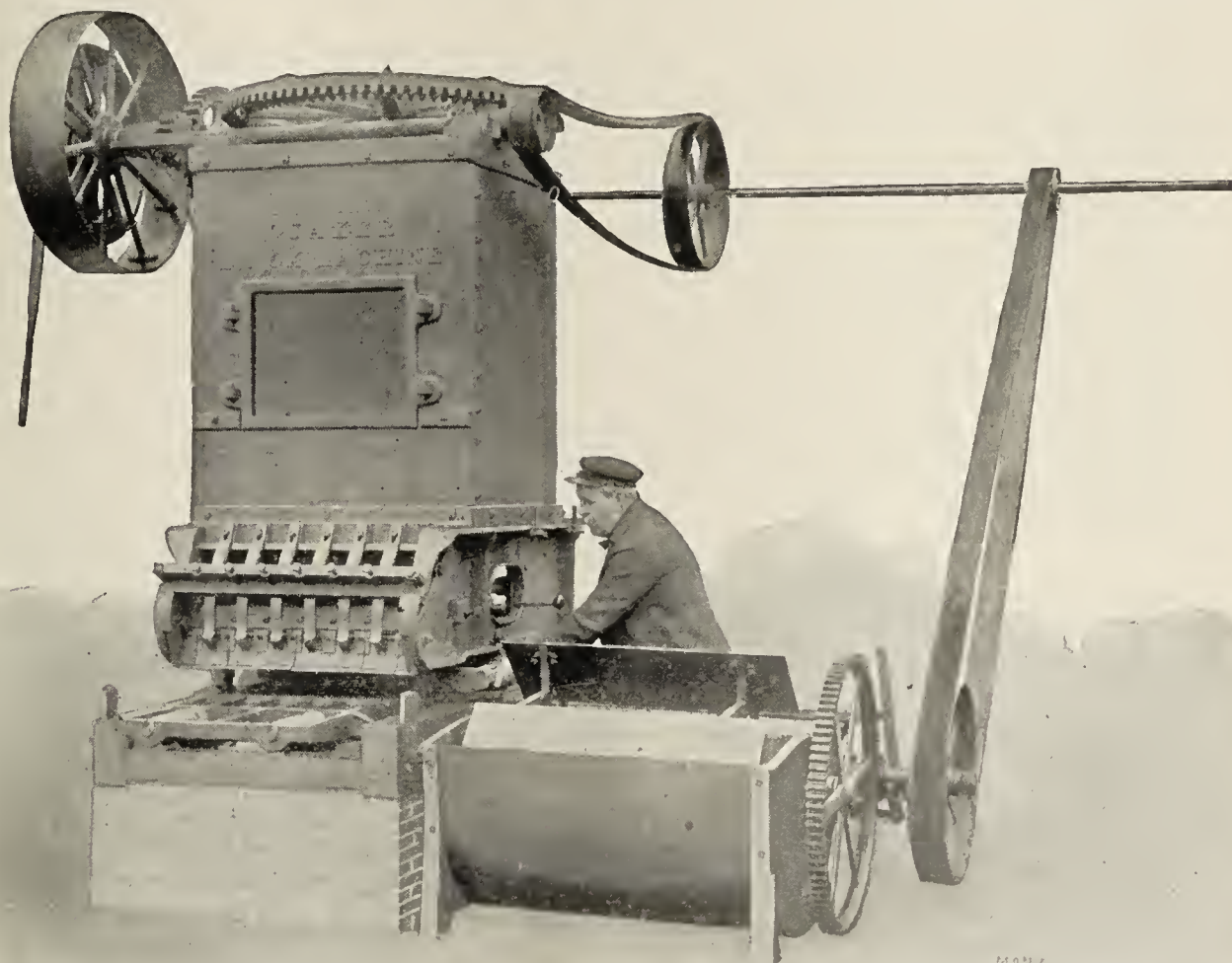
## Our Horse-Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

## Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE. At Bargain Prices.

Odd sizes of moulds. Have not been used.

20 moulds, 8 13-16 x 4 3-16 x 2 7-16. 9-16 in. partitions.  
2 moulds 9x4 1/2 x 2 3/4. 9-16 inch partitions.  
3 hand moulds (3's) standard size.

Second-hand, but used a few days only.

10 moulds, 9 1/2 x 4 9-16 x 2 3/4. 1/2 inch partitions.  
19 moulds, 9 1/2 x 4 3/4 x 2 9-16. " "  
16 moulds 9x4 1/2 x 2 1/4. 9-16 inch partitions.  
19 moulds, 9 x 4 3/8 x 2 1/2.

The Wellington  
Machine Co.,  
WELLINGTON,  
OHIO.

Send  
for  
Circular.



## EDITORIAL NOTES AND CLIPPINGS.—Continued.

Among the yards that are having trouble are Felter's, Gardner's, Gillie's, Welsh's and Smultz's. Nearly all the men who have struck are Poles. The wages paid are the same as paid last year, and the employers cannot pay any more, and have refused to do so. More trouble may follow this outbreak, as the Poles are a lawless and dangerous lot of men.

L. Pryor, a young colored man employed at West & McLain's brickyard, Allegheny, Pa., met with a terrible accident, which, if he recovers, will cripple him for life. His hand caught in some machinery, and was completely ground off before the machinery could be stopped.

Louis Schaefer & Co. have made arrangements to go into the brick business at Le Mars, Iowa. The new plant will be fully equipped with modern machinery and have a daily capacity of 20,000 brick. The members of the firm have had considerable experience in making brick, and hope to be turning out brick by the first or middle of June.

The employes of the Terre Haute brickyards are out on a strike. The men belong to the union, and insist that union wages be paid. This the manufacturers say they are unable to do and meet the prices of the outside yards who are shipping brick into Terre Haute. Some of the yards have secured non-union labor and are running again. The union men, under the leadership of Nicholas Crossland, President of the National Brickmakers' Alliance, have it in mind now to start a brickyard of their own.

In a recent letter, Thomas Carlin's Sons, Allegheny, Pa., say: "We have secured another order from one of the largest steel-making concerns in the country for three grinding pans, one of them being a nine foot dry pan with extremely heavy rolls. This makes about twelve machines of our make in use by this concern, grinding the hardest kind of iron ore. We have an order for two from the Basic Brick Company, who grind the hardest kind of fire clay. They have been using one of our machines for several years, which at that time had rolls heavier than had ever been used by any maker in this country that we know of in this type of machinery. The two ordered are for rolls of slightly less weight. We have recently shipped a small stationary pan for grinding foundry facings to Cincinnati, Ohio, parties."

The report of the Science and Arts Committee of the Franklin Institute on the invention of Mr. H. C. Mueller, Superintendent of the Mosaic Tile Company, of Zanesville, Ohio, for inlaying mosaic designs in tile has awakened considerable interest in architectural circles in Germany. The wish having been expressed in a meeting of the Royal Society of Architects of Berlin to see products manufactured under Mr. Mueller's invention, and to learn the details of his clever method of inlaying, Dr. Karl Duemmler has written to the Mosaic Tile Company, of Zanesville, requesting that samples be expressed him for the purpose of presenting them at one of the regular meetings of the society. Dr. Duemmler, as the editor of the Brick and Pottery Gazette, Berlin, Germany, is known to the readers of foreign clay journals as one of the ablest technologists in this line, and the interest which he himself manifests in this work is in itself a flattering testimonial.

## PACIFIC COAST NEWS.

THE CLAYWORKING FRATERNITY find plenty of time to discuss war matters, as business is quiet with them. Gladding, McBean & Co., Clarke & Sons and others report the trade to be almost entirely devoid of special contracts and news.

M. P. Madison has been awarded the contract for erecting the Zeller Building at Palo Alto, Cal. It will be of pressed brick, with sandstone trimmings, and will cost about \$14,000.

The Portland (Ore.) Clay Company's brickyard, located about half a mile from Portland, is running full force. Twenty-five men are employed every day handling brick and hauling wood. F. Netherland, the manager of this company's establishment, says that the brick business has been so much better that they have been able to run every day during the past year, something that had not been done since 1894.

James Conliff has rented a large piece of ground north of Fullerton, Cal., and will burn a kiln of 500,000 brick for the new buildings to be erected in Fullerton.

Charles Wing, of Mesa, Ariz., has secured the contract for furnishing 200,000 brick for the Odd Fellows' Building at

Tempe, Ariz., and for 100,000 for the Nephi school. He has leased the Goodwin brickyard at Tempe, Ariz., for the purpose of burning the brick.

Fire clay is found near Norris, Mont., and much of the clay mined there has been shipped to Anaconda for use in the manufacture of fire bricks by the Anaconda Brick and Mining Company. An expert, representing a New Jersey fire brick manufacturer, examined these deposits last season, and he says it is the best quality found west of the Mississippi river. Extensive deposits of the same mineral exist at the head of Brown's Gulch. The Helena (Mont.) demand for fire clay has been supplied from this point, and the clay used has given excellent satisfaction.

A brickyard has been opened at Windsor, Cal., to furnish brick for the erection of the McClelland Block in New Windsor.

A big increase in the demand for brick is noticeable in Spokane, Wash., as the result of the building boom in that city. The market this year for brick has been better than has been known for several years past. The price has advanced as a result of the demand, and to supply it several brickyards that have been idle for a long time past are again running, and those already in operation have increased their output. The ready supply of the market has diminished surprisingly quick.

O'Brien & Co., of Yuma, Ariz., are working a force of men on the Speese ranch, south of that city, preparing the ground for the manufacture of brick. A body of excellent clay has been uncovered, and the operators are confident that they will be able to make some of the best brick ever burned in Arizona.

The combined output of the brickyards in Los Angeles, Cal., and vicinity amounts to about 30,000,000 brick annually.

Springer & Merrill, of Baker City, Ore., have moved from there to Pendleton, that State, where they have opened a brickyard.

Chris Schneider, of Silver City, N. M., is making preparations for an anticipated building boom there this summer, and is putting up a big brick kiln in the northern part of the city. The kiln will be of 150,000 or 160,000 capacity.

Another brickmaking plant is to be started in Los Angeles, Cal. Simon Bros., of Pasadena, Cal., have bought eleven acres of land on the east bank of the Los Angeles river for that purpose.

Ed and George Fair will in a few days begin making brick near Armona, Cal. The plant of N. Berry will be used. The yard formerly used by Berry near Lemoore is submerged with seepage water and cannot be used at present.

The Baden Brick Company, at Baden, Cal., is running full force.

Things are lively at Charles Grouard's brickyard at Santa Ana, Cal. A full force of brickmakers is employed, and the output is 8,000 per day. The season lasts about two months, and the quantity of bricks made in that time are used by the trade in Santa Ana.

Phyllis H. Lamoreaux, Secretary of the Remillard Brick Company, of Oakland, Cal., and a man well known in that city, committed suicide there on May 2d by shooting himself through the head. No cause can be given for the act. The deceased was the Secretary and general outside man of the company, his work being largely the handling of the large building contracts of the company. All his business interests were connected with the Remillard Brick Company, which was organized about twenty years ago by Mr. Lamoreaux and his brother-in-law, P. M. Remillard, both of whom came to Oakland from Canada, and although the corporation has grown to be a large concern, it has always remained a family corporation. A widow and two children are left by the deceased.

SUNSET.

## EVIDENCE OF BETTER TIMES.

Convincing evidence of the general improvement in the business situation is afforded by the annual report of the Pennsylvania Railroad Company. This property, forming a great artery in our business and industrial system, and affected and being affected by, with more or less directness, every fiber of our national commercial fabric, has just shown most encouraging results. Its gross and net earnings were both good; all fixed charges were met, large sums were expended on improvements, nearly two million dollars were held out for extraordinary expenditures of the year, and 5 per cent. dividend paid from an 8 per cent. dividend earned. No increase of bonded indebtedness was made, and, in fact, high-rate bonds were refunded at lower rates. A remarkable earning capacity and financial position is thus indicated for this property, which has long been characterized as possessing the highest physical condition. The report shows most conclusively that times are really better.—Power and Transmission.



**BRICK MACHINERY****Wonder No. 4.**

Capacity, 60,000 to 100,000 per day.

**Big Wonder.**

Capacity, 50,000 to 60,000 per day.

**Intermediate Wonder.**

Capacity, 25,000 to 40,000 per day.

**Little Wonder.**

Capacity, 20,000 to 25,000 per day.

**BRICK CUTTERS****Cunningham's Side Cut Automatic Cutter.****Cunningham's End Cut 3-Stream Automatic Cutter.****Cunningham's End Cut 2-Stream Automatic Cutter.****Cunningham's End Cut 1-Stream Automatic Cutter.****Side Cut Broad Delivery Table.****Hand Brick Cutting Table.****Combination Side and End Cut Hand Brick Cutter.****PUG MILLS****No. 3, Plain Closed Top Pug Mill.****No. 3, Open Top Pug Mill with Wallace Patent Cleaner Teeth.**

Tempers clay for 75,000 to 100,000 brick per day.

**No. 2, Open Top Pug Mill.****No. 2, Closed Top Pug Mill.**

Tempers clay for 35,000 to 50,000 brick per day.

**No. 1, Open Top Pug Mill.****No. 1, Closed Top Pug Mill.**

Tempers clay for 25,000 to 35,000 brick per day.

**No. 1, Wallace Patent Pug Mill.****No. 2, Wallace Patent Pug Mill.**

Tempers clay for 20,000 to 40,000 brick per day.

**DRAIN TILE MACHINERY****Little Wonder Makes 3 to 12 inch.**

Capacity, 8,000 to 12,000 4-inch daily; others in proportion.

**Intermediate Wonder Makes from 3 to 18 inch.**

Capacity, 10,000 to 15,000 4-inch daily; others in proportion.

**Drain Tile Cutting Tables for large and small tile Trucks for Handling Large Tile. Reversing Device for large tile.****CLAY PREPARING MACHINERY****Dry and Wet Pans, 6, 8 and 9 feet, with wood and iron frames.****Clay Screens.****Clay Crushers and Stone Separators of many designs and capacities to suit conditions.****Clay Elevators all lengths and widths to suit your desire.****Dry Clay Bucket Elevators of length and breadth to suit desires.****Friction Hoisting Drums.****Friction Geared Hoisting Drums.****Clay Cars. Truck Wheels and Axles.****Kiln Doors and Frames.****Kiln Doors without Frames.****Wheelbarrows for Brick and Tile.****Brick Pallet Spring Trucks.****Engines. Boilers. Pumps.****Shafting, Pulleys, Hangers, Couplings, Journal Bearings and Belting, both Rubber and Leather.**

# What's in a Name?

A GREAT DEAL IF A THING BE WELL AND TRULY NAMED AND THIS IS TRUE OF . . .

# Wonder Clayworking Machinery,

WHICH is so called because it has proven by actual work in various kinds of clays to have a **Wonderful** capacity, both for quantity and quality. It has a **Wonderful** pugging and tempering capacity and produces a **Wonderfully** strong brick, free from laminations, and in connection with our new automatic cutting table a **Wonderfully** straight, true brick is made of almost any clay. It is this **Wonderful** quality that enables our machinery to work successfully some clays which other auger machines can not work at all satisfactorily. This fact has been demonstrated time and time again. The users of **WONDER MACHINERY** all testify that it is well worthy of the name. They have demonstrated that it has **Wonderful** wearing qualities for which reason it is, in the long run, the best and cheapest machinery on the market.

It will afford us pleasure to send you testimonial letters attesting these facts and quote prices on individual machines or complete plants.

## Wallace Mfg. Co.

Frankfort, Indiana.

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

See Ad. on Page 483.



# We Don't Want The Earth!



If all the soil on the earth were scraped off and made into a mud ball, it would bear about the same proportion to the earth's mass that the pellet which Atlas holds in his palm bears to the globe upon his shoulders.

Its too big a load to carry. We are satisfied to have the enterprising clayworkers of the country own and use the earth but we desire to call their attention to the superiority of our line of machinery for manufacturing this earth into all kinds of clay products. There are no machines equal to ours as money makers and money savers. They embody the best patents and are faultlessly constructed. There is no highway to success but merit and it is along this highway that we have traveled.

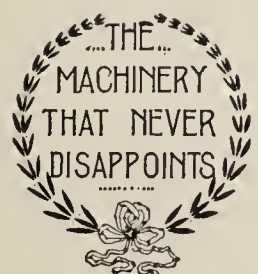
Our Dry Press Machinery has no superiors. Our stiff mud line has received the unanimous endorsement of the largest manufacturers using them.

Our Soft Mud Machines have made more money for their users than any other make of machinery. We have interesting information concerning all these lines. If you are interested, a postal and a minute will bring you particulars.



## The American Clay- Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.





FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED — 10,000 to 12,000 wood pallets, 1/2-inch by 10-inch by 32-inch or 33-inch.  
51c Address "S," care Clay-Worker.

FOR SALE — Second-hand "Martin" steam power brick machine. Good as new and satisfactory.  
51fd Address "M," care Clay-Worker.

FOR SALE — Complete set of kiln irons, suited for square down draft kiln (Eudaly or Griswold). Good as new. Will sell cheap.  
Address BOX 92,  
Zanesville, Ohio.  
51cm

WANTED — Position as superintendent or assistant in enamel brick works by man having experience making and burning enamels.  
51cm Address "B," care Clay-Worker.

FOR SALE — Great Bargain—Henry Martin "A" brick machine, capacity 30,000; in very good order; pug mill, crusher, elevator, shafting, etc.; \$750. Good 30 H. P. Erie engine and boiler, \$400.  
Address LOCK BOX 13,  
Winchester, Va.  
51cm

FOR SALE — For \$1,500, dry press outfit consisting of three-mold Boyd press, 42-inch Steadman pulverizer, latest model; 40-foot elevator, screen, mixer, pulleys, etc. A good plant in good order. Come and see it.  
THE DAYTON BRICK CO.,  
Dayton, O.  
511p

TO RENT — Brick yard; two Martin machines, fully equipped and ready with small outlay to start manufacturing. No competition. Present owner would assist in the management. Address  
W. H. ODELL,  
Box 476, Brockville, Canada.  
31c

FOR SALE — A complete brick plant which cost above \$150,000, at less than 20 per cent. of cost. For full particulars address  
A. H. MOODY, Agent,  
Keokuk, Ia.  
51cm

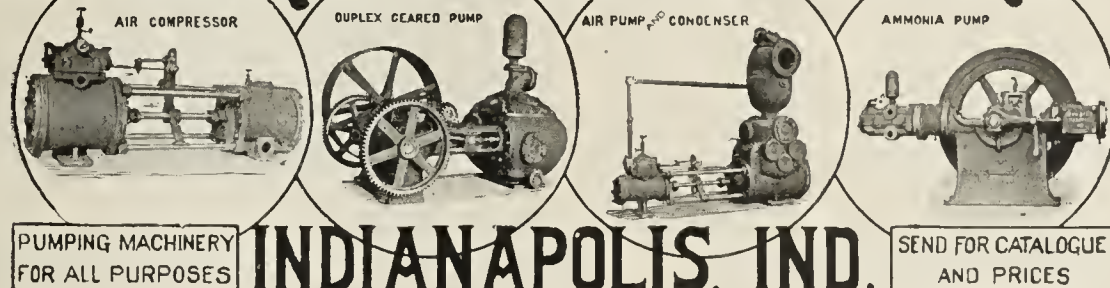
WANTED — An experienced man to take the foremanship of a paving brick plant. Must understand the business thoroughly. A sober, capable and industrious man will be given a permanent position. None other need apply. References required.  
Address "PARTICULAR,"  
Care Clay-Worker.  
51d

WANTED — In Western Pennsylvania, the following second-hand machinery; must be cheap and in good condition: One clay and shale pulverizer or disintegrator, one 80 H. P. tubular boiler, one 50 H. P. engine.  
Address "GRINDE,"  
Care Clay-Worker.  
51d

FOR SALE — A new factory for fire brick, paving brick, hollow blocks and drain tile. Unlimited fire clay. Shale and coal, four kilns, tunnel driers and all machinery. Situated on railroad switch. Reason for selling, other business. Address  
51dm "BRAZIL," care Clay-Worker.

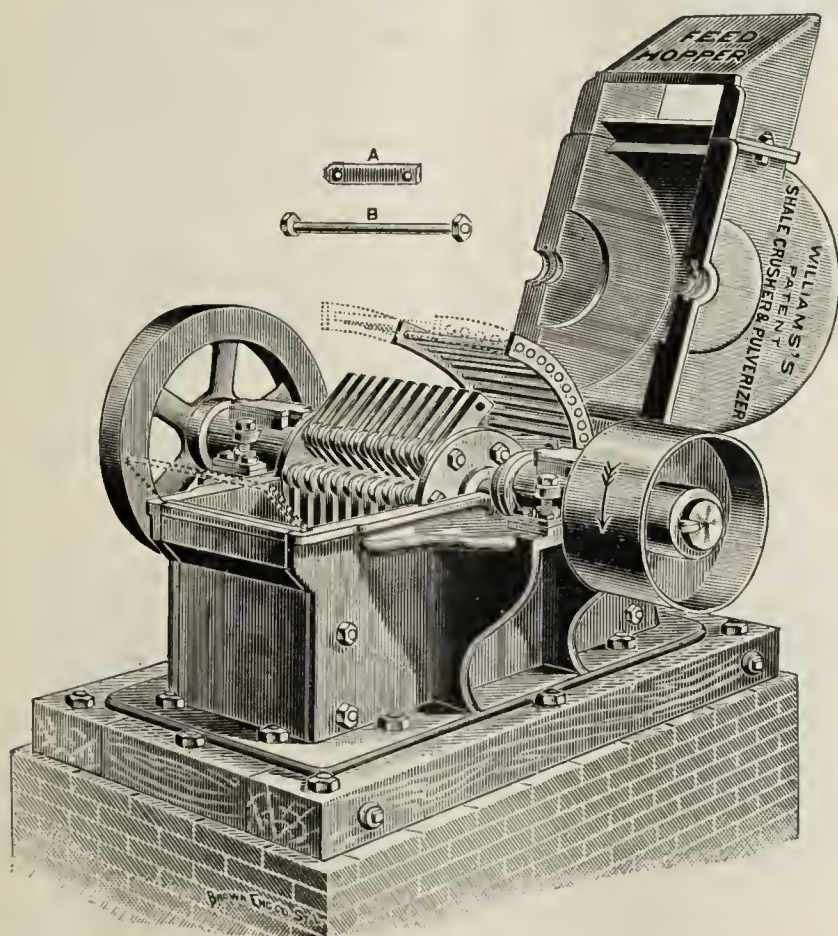
# S. GEYSBEEK, Ceramic Chemist, New Brighton, Pa.

## DEAN BROS. STEAM PUMP WORKS.



# WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

A Clay Pulverizer of Wonderful Capacity.



Williams's Shale and Clay Pulverizer.  
With Clay Steamer Attached.

Our Pulverizer is Fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.

Office of HYDRAULIC PRESS BRICK CO.

St. Louis, Mo., October 30th, 1897.

MILTON F. WILLIAMS, Esq., City.

Dear Sir;—Enclosed please find our order No. 125 for one No. 2 Pulverizer. In a few days, or as soon as our drawings are completed, I expect to give you an order for two more. We have three of your Pulverizers now running, giving perfect satisfaction. We are able to grind clay to any degree of fineness by making very slight changes in the machine. They have been running several months without repairs worth considering.

Yours truly,  
HYDRAULIC PRESS BRICK CO.,  
W. N. Graves, Gen'l Supt.

HOTEL BERNARD, Wagner, Ind. Ter.  
WILLIAM'S PATENT CRUSHER AND PULVERIZER CO.,

Dear Sirs;—The Pulverizer we bought of you sometime ago is a dandy, we would not exchange it for any grinder we know of. Keeping it in repair costs nothing to speak of. Wishing you every success, we are  
Yours respectfully,  
TAYLOR & RAINS.

These machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known. Will guarantee them under any and all circumstances.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.  
2705 North Broadway, St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.



**FOR RENT**—Desirable brickyard on James River, Va., equipped for business.  
12 d T. F. ROGERS, Norfolk, Va.

**FOR SALE**—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address,  
1 t f d JESSE T. MORGAN, Wilkes-Barre, Pa.

**NO DRY PRESS BRICK PLANT** complete without the Carmichael Clay Steamer.

T. W. CARMICHAEL,  
Inventor and Manufacturer,  
6 t f d Clarksburg, W. Va.

**FOR SALE**—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN,  
3 t f d Room 13 Palmer House, Chicago, Ill.

**FOR SALE**—Licenses to erect patented kilns, continuous, continuous and single combined, connected up and down draft and muffle kiln, for burning fire, paving, building, common and other brick, pipe, terra cotta, etc. Large and small plant.  
DUPLIX KILN CO.,  
51 c Perth Amboy, N. J.

**FOR SALE**—One 8-foot and one 4 foot 8-inch Wilkes grinding pan; a 100 horsepower boiler, also fire clays mined from our own clay banks at Woodbridge, N. J., and a quantity of fire brick bats and one 12-inch Ingraham reduction mill.  
SALAMANDER WORKS,  
51 d m 39 Cortlandt St., New York City.

**WANTED**—A first-class man who understands the paving brick business thoroughly to take charge of a large plant, running the year round. A good place for a good man who knows his business and will devote himself to it. Applicants will please state where last employed, age, salary expected, etc. Address  
51 d "EASTERN," care Clay-Worker.

**FOR SALE**—Brick and tile plant in the South; R. R. switch to kilns, soft and stiff mud machines, Sharer dryer. Clay good for front brick and fire proof wares. Growing market from wide and prosperous territory. Will sell entire plant, or machinery alone. Will sell part interest with management to right man. Address  
4 t f 5 p G. P. ORENDORFF,  
Lacon, Morgan Co., Ala.

**FIRE BRICK MANUFACTURERS** desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address  
41 d SUPERINTENDENT,  
care Clay-Worker.

**FOR SALE**—On account of death, the following described machinery. All or any part will be sold at a bargain: One dry pan, manufactured by the Eagle Iron Works, Des Moines, Ia.; one Andrus brick press—a No. 34—manufactured by H. O. Whitney, Keokuk, Ia.; screen and elevator, made by M. F. Williams & Co., St. Louis, Mo.; two boilers, 4 by 14 feet, complete and in good condition; one 120 H. P. engine, cylinder 14 by 21; 40 feet 14-inch double leather belting in good shape; 36 feet 27-16-inch shafting with six hangers; one 4 feet 12-inch face friction pulley. Address  
51 d m J. H. M'GREGOR BRICK CO.,  
Bloomington, Ill.

**FOR SALE**—Fire clay property and factory site; 2,500 acres within six miles of Baltimore, Md., a large part underlaid with clays of fine quality and great variety, suitable for making red, buff and other kinds of brick, tiles and terra cotta. Railroad through property connects it with Baltimore and Washington. Water connection with Baltimore and Chesapeake Bay by channel 15 feet deep. Good water power on property. Fine site for factories. Parts of property are suited for suburban development and parts for truck farming. For sale as a whole or in lots to suit, on reasonable terms. Also a small factory equipped for making roofing tiles and brick. Address  
51 c m CURTIS CREEK M. F. & M. CO.,  
12 St. Paul St., Baltimore, Md.

**PRESS BRICK PLANT FOR SALE OR LEASE.**

Complete. Daily capacity 15,000. Good condition. Good opportunity for active parties. Terms easy. Located in the Central part of Pennsylvania. Address  
43 c "JOHN,"  
care Clay-Worker.

## BRICK CARS and TRUCKS

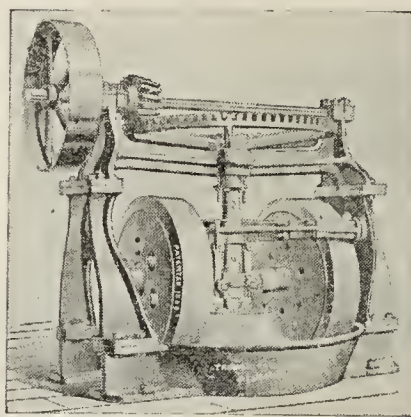
Of Any and All Kinds.  
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

### THE ATLAS BOLT & SCREW CO.,

Cleveland, Ohio.

## CARLIN'S DRY PANS are



Stationary Wet Pans.

THE BEST and in the long run the cheapest Dry Pans on the market. They are the cheapest because they are the best. Carlin's Dry Pans are built for service and capacity. Ask those who are using Carlin's Dry Pans and they will tell you they are the best and cheapest pans made. We make several different sizes. If you are going to buy a Dry or Wet Pan and want the best value for your money don't fail to get our prices.

We also sell Engines, boilers, Pallet cars, Revolving derricks, Conveyors, Hoisting machinery, etc. Send for prices and terms.

## Thomas Carlin's Sons,

ALLEGHENY, PA.

## IF YOU NEED.. Wooden Pallets,

— WE CAN FURNISH YOU THE BEST.

We make all Styes of

Rack Pallets,  
Hacking Pallets,  
Pallets for Dryers,  
Also Decks for Dry Cars.

We can ship them anywhere.

## W. B. MERSHON & CO.,

Saginaw, East Side Mich.

MENTION THE CLAY-WORKER,  
WHEN WRITING TO ADVERTISERS,  
MENTION THE CLAY-WORKER.

• • •

Get good Pallets from those who know how to make them. It will pay you in the long run. . . . .  
Send for circulars and prices.

• • •



# FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

**Sewer Pipe all Sizes.**

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

**EVENS & HOWARD,**  
920 Market Street, - - - ST. LOUIS, MO.

## The PERFECT CLAY SCREEN,

..Is the Acme of Perfection..

THIS SCREEN was not designed with the object of placing it on the market, but instead is the product of **Practical Experience**. The old adage "necessity is the mother of invention" is true in every sense of the word in this particular case. This screen is the result of the serious obstacles encountered in endeavoring to screen shale and fire clay for semi-dry pressed brick, and its work proves that it is worthy of its name—**Perfect**—for no dry pan can grind shale or fire clay or any other clay as moist as it can be screened on **The Perfect Clay Screen**. This screen enables its users to get more clay and a finer grade and with more moisture than any other make, in fact it is the only **Clay Screen** on the market. The commendable features of this screen are that it cannot be **pasted** over and **perfectly separates** all the clay to the full size of the perforations. Bear in mind that each and every one is fully guaranteed, no payment required until purchaser is satisfied. Taking into consideration that 10 of these screens have been sold since January 1st, is evidence that our claims can be substantiated by our patrons. Write for full description, prices and terms.

**ELDER & DUNLAP, Bloomington, Ill.**



Mey Detachable Chain Belt.

**F. H. C. MEY,**  
**Chain Belting Engineering Works,**

Approved Appliances for

**Elevating, Conveying and Transmission of Power,**

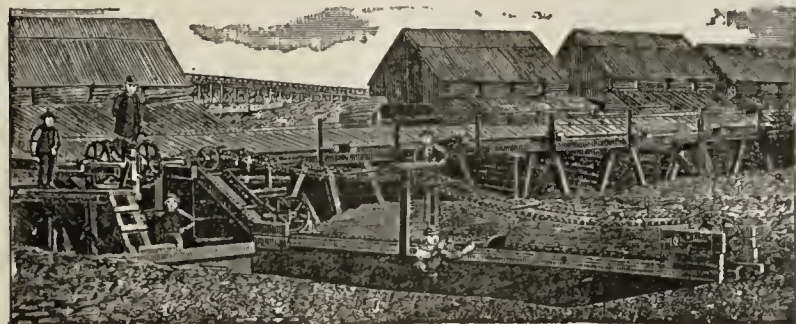
64 to 68 Columbia St., BUFFALO, N. Y.



Ewart Detachable Chain.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

**Make  
Many More  
Thousands**

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

**FOR SALE AT A BARGAIN**—One Penfield Upright Soft Mud Brick Mill with Clay Crusher, Elevator and Pug Mill, with all fixtures. Used but a part of one season. Good as new. Address J. W. W., 3 3 cm Care Clay-Worker.

**WANTED** — Situation as Superintendent or Foreman of brick works. Practical in every detail. No. 1 burner, up or down-draft kilns, dry or stiff clay process. Address SUCCES, 3 tf 125 P. Care of Clay-Worker.

**FOR SALE** — We will sell a part interest or the whole of our Paving Brick and Tile factory. Will give a good liberal deal as we cannot give it the attention necessary. For full particulars address LEHIGH BRICK, TILE & M'FG CO., 3 3 dc Lehigh, Iowa.

**FOR SALE CHEAP.** — One Second-hand, double die Columbian Repress; practically as good as new.

One Quaker Horse-power Brick Machine, in good order.

One Monarch Brick Machine, only used one short season. All in running order.

THE HORTON M'FG. CO.,  
1 tf L. Painesville, Ohio.

**FOR SALE**—One nearly new 4-mold Boyd Dry Press brick machine; one 4-mold Eureka dry press brick machine; one No. 2 Worrell clay dryer; one 48-inch Ross disintegrator; five second-hand horizontal boilers, 15 and 16 ft lengths, 3-inch tubes, ranging from 50 to 60 h. p., 5 and 6 foot diameter; one straight line engine, 14 x 14 cylinder, nearly new, a No. 1 order; 8 fans, 7 ft. diameter, good as new. Will be sold very low. Address C. SIEDLER, Pres. 2tf dm 156 Fifth Ave., New York.

### FOR SALE CHEAP.

One second-hand, double die Columbian Repress; practically as good as new.

One Quaker Horse-power Brick Machine, in good order.

One Ten Horse Power Portable Engine, in good order. THE HORTON M'FG. CO., 1 tf l Painesville, O.

### TO PRACTICAL BRICKMAKERS AND CAPITALISTS.

**TO BE SOLD**—The whole or half interest in the two best brickyards within hauling distance of the city of Vancouver, B. C. The brick are preferred to all others, there is demand for all you can make at the best prices, which averages seven to eight dollars on the yard. Apply to 3 3 5p J. W. BURNET, 13th ave. Mt. Pleasant, Vancouver, B. C.

### FOR SALE.

Two 8-foot dry grinding pans, under gear pan.

One 8-foot, under geared, iron frame wet for wood work.

One new 5-foot wet pan for wood frame.

One Potts stock brick machine.

One Potts sanding machine.

One 7-foot horizontal pug mill.

Two vertical pug mills.

Large lot of steel and iron pallets.

Twenty pallet cars.

One 30 H.-P. horizontal tubular boiler.

Lot of boilers, tanks, etc.

THOMAS CARLIN'S SONS.  
11 12 c Allegheny, Pa.

### FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.

8-foot Chisholm, Boyd & White dry pan.

1 revolving screen and mixer, 1/2 screen

and bucket elevator, with 20 6-inch buckets.

6 spring brick trucks.

Lot shafting, belting and pulleys.

75-horse-power Westinghouse engine.

1 Barr Pumping Company steam pump.

All new or little used, and in excellent condition.

WALNUT,  
4 tf d Care Clay-Worker.

### ENGLISH PLANS FOR PLASTIC BRICK WORKS.

Complete sets including general plan and elevation of works.

Plans and sections of machine room.

Plans for Dryer heated with waste gas from boiler.

Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.

Prices on application to

BENNETT & SAYER, Derby, England.



H. W. CLASSEN &amp; CO.,

CHAS. H. CLASSEN, Proprietor.

Manufacturers Agents, for sale of Sewer Pipe, Fire, Pressed and Paving Brick, Clay Products, etc. Correspondence invited. 305 McElderry's Wh'f (Long Dock.) Box 8, Builders' Exchange, 33 c Baltimore, Md.

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An opportunity for ambitious young men to take up the study of law without neglecting the business of earning a living. You can live at home while preparing for admission to the bar. We require only your evenings and guarantee as thorough a legal training as may be had at any law school in America. Write at once for our special offer to new students.

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**Manganese.**

From Producer to Consumer.

For Brick, Tile, Terra Cotta  
and Pottery Makers.

PULP, POWDERED OR GRAIN.

Samples and Prices on Request.

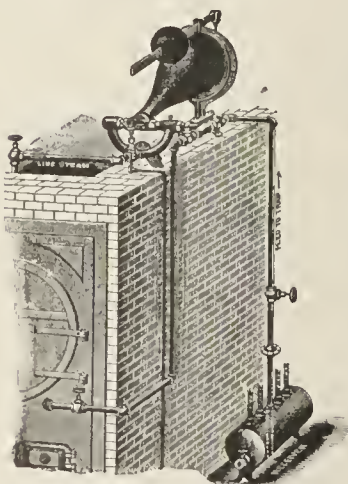
**KENDALL & FLICK,**  
MINES AND WORKS IN VIRGINIA.

OFFICE:

618 Penna. Avenue N. W.,  
WASHINGTON, D. C.

Booklet on the use of this material free.

## Return Trap



For returning direct to Boiler the condensed Steam from the steam dryers, etc.

Positive and Automatic.

Economical.

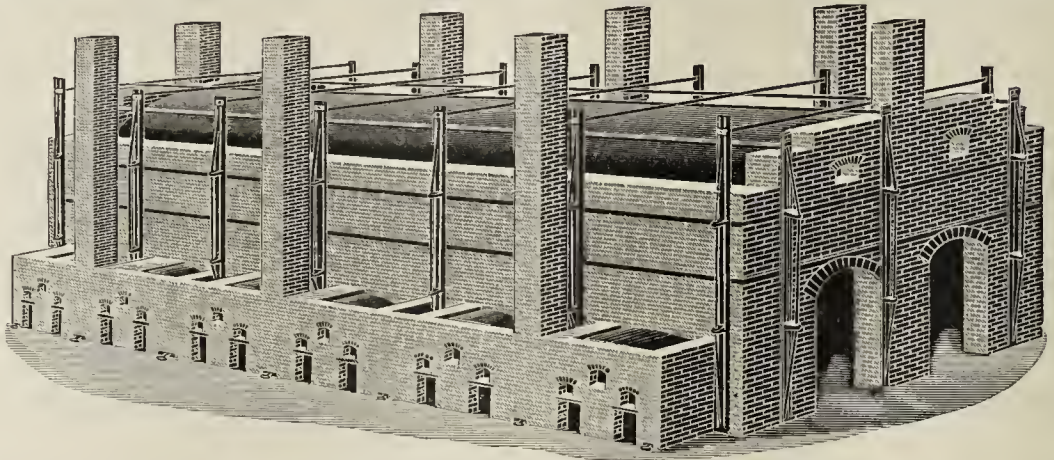
If you are using steam apparatus, particularly a steam dryer, I can save you good money.

For particulars write to

**A. SORGE, Jr.,**

1021 Monadnock Block, CHICAGO, ILL.

## The SWIFT SLACK COAL COKING TABLE FURNACE KILN.



Furnaces can be attached to either Up-draft clamp kilns, or round or square down-draft kilns. Have already changed nearly 100 old kilns of almost every patent, both down-draft and up-draft, and one continuous kiln for the Galesburg Paving Brick Co.

**F. E. SWIFT, Washington, Ia., U. S. A.**

## Roofing Tile is Coming....

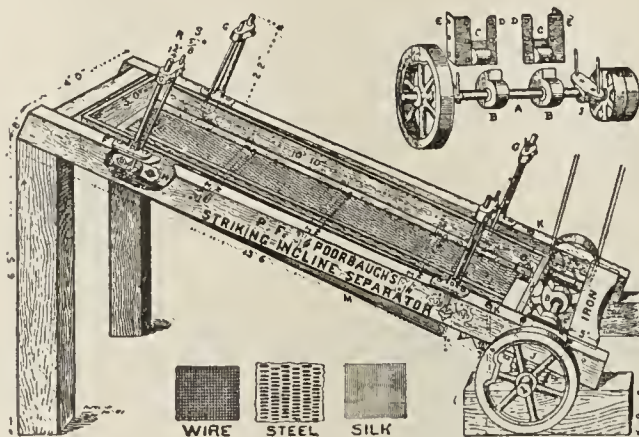
➔ THE MACHINE TO MAKE  
IT HAS ARRIVED. . . . .

A simply and very economical way of making Clay Shingles or Roofing Tile is found by using the machinery covered by recent patents granted to A. H. Murray and C. S. Welch. This industry is completely revolutionized by reducing the cost of manufacture to a nominal sum compared with the cost under the crude and expensive methods heretofore in use. This machinery is now ready for the market, and it has been thoroughly tested and is in practical operation to an extent that places it beyond a doubt of its practicability. Only territory east of the Mississippi river open. Correspondence solicited.

For full information address

**MURRAY & WELCH, Huntington, W. Va.**

## STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed  
Stone, Cement, Fertilizer  
and all Minerals.

• • • • •

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

**THE PITTSBURG MINERAL SCREEN CO.**

Write for Prices.

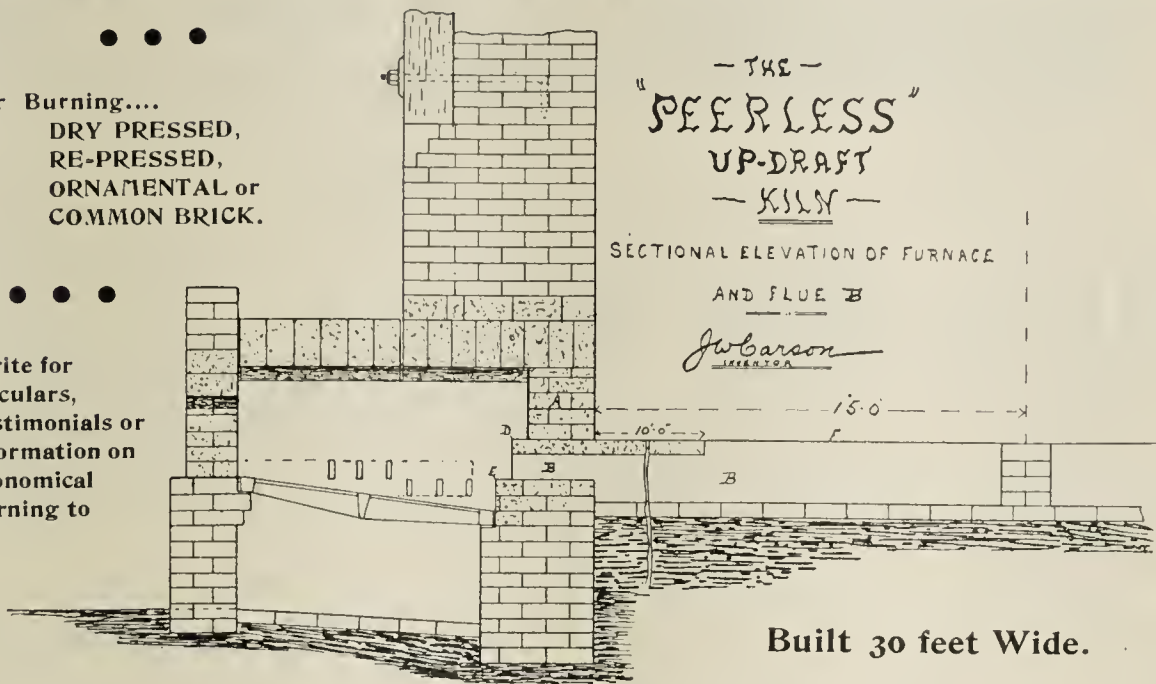
PITTSBURG, PA



# The "PEERLESS" UP-DRAFT ....KILN.

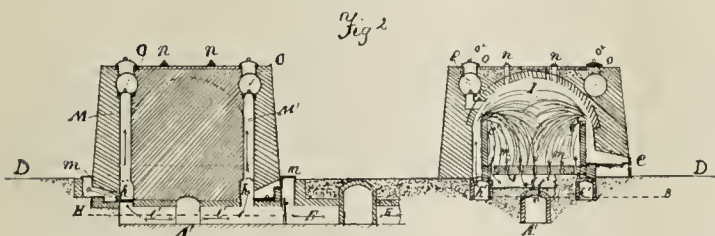
For Burning....  
DRY PRESSED,  
RE-PRESSED,  
ORNAMENTAL or  
COMMON BRICK.

Write for  
Circulars,  
Testimonials or  
Information on  
Economical  
Burning to



J. W. CARSON, LaPrairie, P. Q., Can.

## The Down Draft Continuous Kiln.



This kiln is fired by suitable furnaces on each side of the tunnel, no fuel comes in contact with the clay ware, no firing through the top, no refraction from the down draft whatever; it saves as much fuel as the old Continuous fired through the top. It is adapted to use any suitable kind of fuel to

burn clay ware. The automatic draft regulator assures an even draft at all times in every compartment in operation. The cooling of the clayware is fully controllable in the hand of the burner at will. The draft of the advance heat and combustion through the floor is connected from compartment to compartment until the heat is taken up by the wares before leaving the stack. The heat from the cooling compartments are drawn to the compartments for steam drying the green wares. For small yards it is not necessary to construct the full kiln, only build compartments as is necessary for the output and if the demand requires more kiln room, extend any time later. I guarantee that my Kiln will burn as clear color, sound enameled clay ware as any other down-draft kiln in use. Parties intending to improve their product and profit should not fail to correspond with me in regard to cost of construction and license right, which I will give for a reasonable living price. In corresponding, state the kind of material manufactured, also daily capacity, to the Inventor and Patentee,

C. F. KAUL, Madison, Neb.

## NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in  
United States, Canada  
and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }  
Marletta, Pa.

Chenoa, Ill.



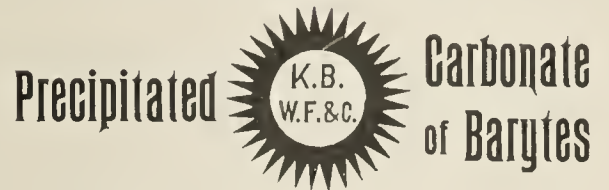
## GABRIEL & SCHALL

P. O. Box 2654.

205 Pearl Street.

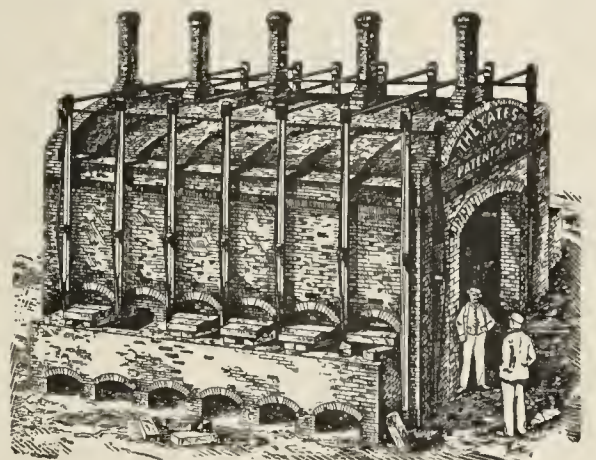
NEW YORK.

Sole Importers in the United States of the



The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.



For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, come and see what we are doing.

ALFRED YATES,

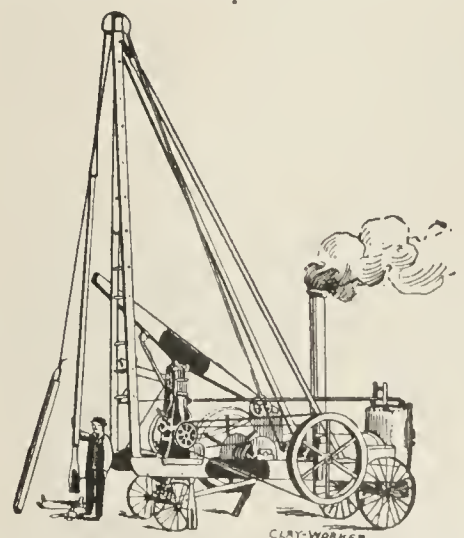
Man. Johnsonburg Vitrified Brick Co.,

Johnsonburg, Penn.

## W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,  
PERTH AMBOY, N. J.



## STUDY MEDICINE AT HOME THIS SUMMER.

We instruct by correspondence. Devote your evenings to study and we do the rest. By our method, success comes easy to you. You cannot afford to miss this opportunity. Address for particulars, Indianapolis School of Medicine, 24 Pennsylvania St., Indianapolis, Ind.

The Henry Martin  
Brick Machine Mfg. Co.,  
Lancaster, Pa.

## Machine Brick Moulds a Specialty.

With the latest improved machinery, and the best of skilled help and the very best material we are enabled to furnish moulds better and cheaper than any other make.

Send sample order.

### PRICES:

Steel bound machine moulds,  
5 or 6 brick ..... \$1.75 each  
With Steel Lined Heads,  
5 or 6 brick ..... \$2.00 each  
With Panel Bottoms, solid bottoms, 5 cents per  
brick extra.

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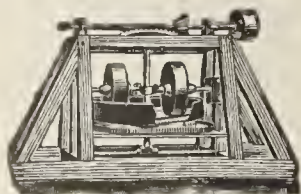
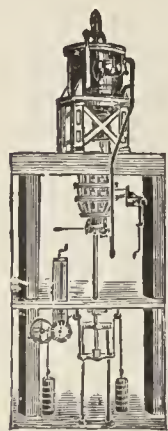
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IN 1820.

Manufacturers of

### STEAM SEWER PIPE PRESSES

Of different sizes, making from  
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Pipe, Brick, Tile, Copping,  
Fire Proofing and Building  
Block Dies.



CLAY GRINDING  
AND TEMPERING  
PANS AND PUG  
MILLS. ....

Feed Screws for Mining Clay; Steam Engines  
and every variety of Iron and Brass Castings,  
Shafting and Pulleys.

Send for circulars and estimates.

JAS. MEANS & CO.,  
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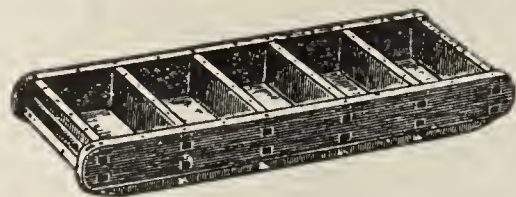
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and....

MACHINE

## MOULDS

We manufacture the the most substantial Moulds known,  
and guarantee every Mould to be first-class  
in material and workmanship.



A Special Discount on all orders received  
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CREDIT REPORTS on men who make BRICK, on men  
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worthy service at lowest prices; ordinarily \$1.00 for  
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Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and com-  
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## No Dry Press Brick Plant Complete

..... WITHOUT .....

## The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

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Fourteen (14) sold already this Season.

## Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

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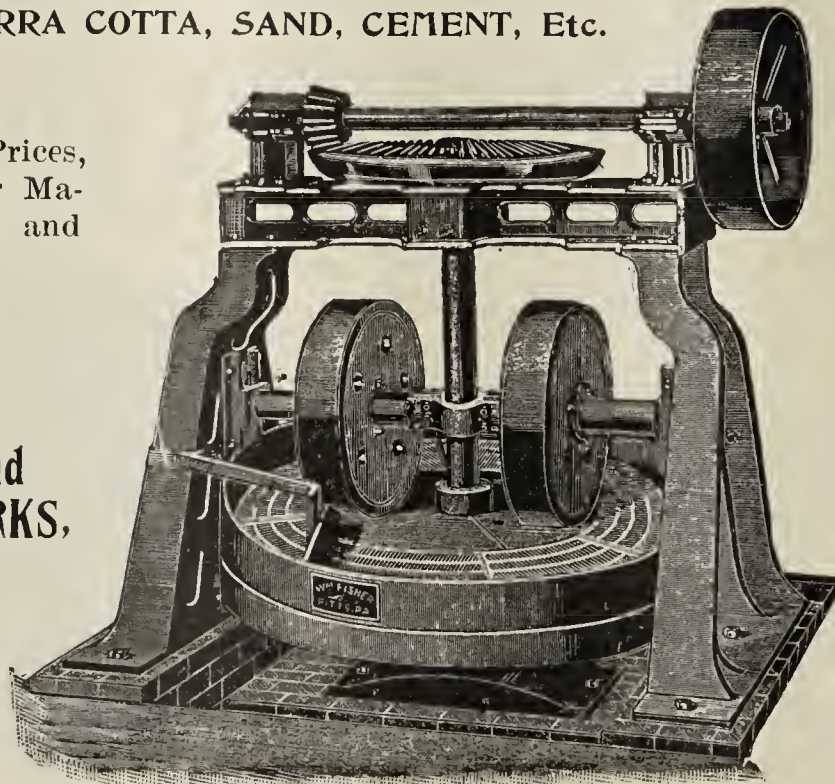
When writing for Prices,  
state kind of Clay or Ma-  
terial to be ground and  
capacity required.

....

FISHER ENGINE  
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MACHINE WORKS,

Phillips & McLaren,  
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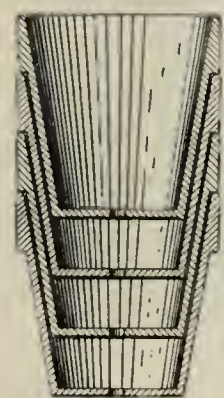




FIRE

**Dover Fire Brick Co.,**  
INCORPORATED 1870. MANUFACTURERS OF  
**Dover and Buckeye Fire Brick,**  
*Unexcelled for Kiln Purposes.*  
 44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK



## Make Money

WITH THE ONLY SUCCESSFUL

# Flower Pot Machine

(PATENTED.)

No expert workmen required.  
 Capacity in 10 hours:  
 6,000 two-inch Pots;      3,500 five-inch Pots;  
 4,000 four-inch      2,000 seven-inch "

Write for Circular and prices.



**The Rockwood Mfg. Co.,**

78 South Pennsylvania St.,

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# "LEVIATHAN."

"Upon Earth There is not His Like!"



Sept .....1896.

**MAIN BELTING CO.,**  
 55 and 57 Market St., Chicago, Ill.  
 GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige.  
 Yours very truly,

Manufactured under Special Process.  
 A Guarantee of Superiority.

NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

## MAIN BELTING COMPANY,

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## Conveying, Elevating and... Power-Transmitting Machinery.

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Specialties for Handling  
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GENERAL MACHINISTS,  
 127, 129, 131, 133 West Washington St.,  
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**CALDWELL**  
**Steel Conveyor.**  
Manufactured exclusively by us at Chicago with latest improvements



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POPULAR

**MONON ROUTE**  
LOUISVILLE NEW ALBANY & CHICAGO RY CO.

IS THE BEST LINE TO

# CHICAGO

LATEST IMPROVED  
**VESTIBULED TRAIN SERVICE**  
 Pullman Sleepers, Elegant  
**PARLOR CARS AND DINERS**  
 Local Sleeper in Indianapolis Ready at 8:30 p.m.  
 Leave Chicago, Returning, at 2:45 a. m.  
 Can be Taken Any Time After 9:30 p. m.  
**TICKET OFFICES:** 2 West Washington St.,  
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### Indianapolis to Cincinnati

Six trains every week day. Parlor chairs and  
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5 trains every week day  
 to Dayton.  
 Fast time between Indianapolis and Colum-  
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Through Sleeping Cars to Washington, Balti-  
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2 trains every week  
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the kind of "CUTS"  
 you use;

Poor ENGRAVINGS  
 will spoil your cata-  
 logue or advertise-  
 ment.

WE MAKE THE GOOD KIND.  
**IND'PL'S ENGRAVING  
 AND ELECTRO' CO.**  
 36 E Washington St.



## Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD, JACKSONVILLE and HANNIBAL, MO.

Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

### TIME OF TRAINS AT INDIANAPOLIS:

| LEAVE.                |           |
|-----------------------|-----------|
| Mail and Express..... | 8.15 a m  |
| Accommodation.....    | 3.45 p m  |
| Fast Express.....     | 11.10 p m |

| ARRIVE.               |           |
|-----------------------|-----------|
| Fast Express.....     | 3.35 a m  |
| Accommodation.....    | 10.40 a m |
| Mail and Express..... | 4.40 p m  |

JNO. S. LAZARUS, Gen. Pass. Agent.

## VANDALIA LINE

The Short Line for

## St. LOUIS AND THE WEST.

| LEAVE<br>INDIANAPOLIS, | AT. TERRE<br>HAUTE | AR. ST.<br>LOUIS. |
|------------------------|--------------------|-------------------|
| * 7:20 am              | 10:05 am           | .....             |
| * 8:10 am              | 10:15 am           | 3:15 pm           |
| * 12:40 noon           | 2:35 pm            | 7:12 pm           |
| * 7:00 pm              | 9:04 pm            | 1:44 am           |
| * 11:20 pm             | 1:30 am            | 7:00 am           |
| *Daily.                |                    |                   |

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

## ARE YOU LOOKING

### FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

### FINE SITES FOR NEW MILLS

### BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

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### INTELLIGENT HELP OF ALL KINDS

### MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

### 100 Cities and Towns WANTING INDUSTRIES

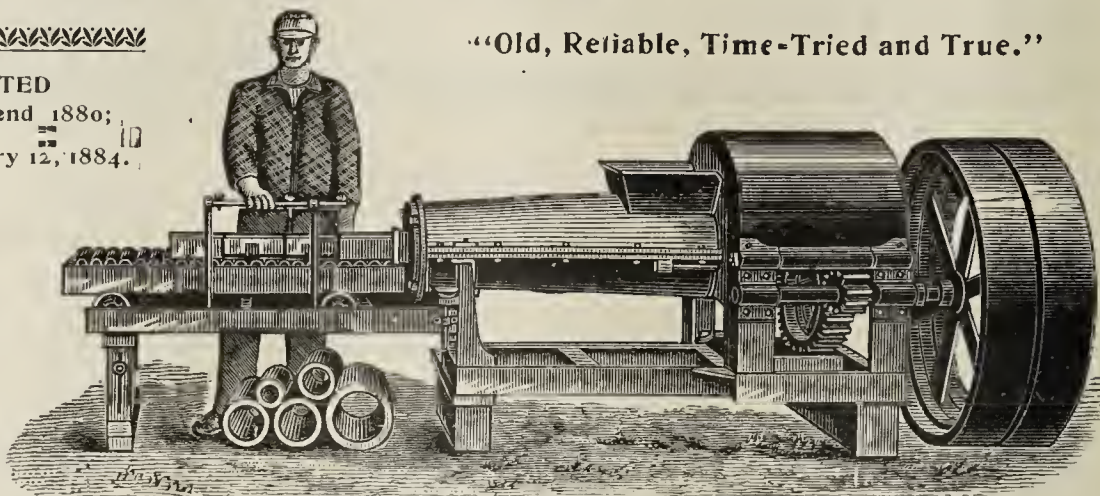
This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

## KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

PATENTED

June 22nd 1880;  
and  
February 12, 1884.



"Old, Reliable, Time-Tried and True."

P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

## H. C. BAIRD & SON, PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

## Still Further Testimony!

Soft Mud Brick Dried in 10 or 12 hours.

Most trying service with large brick of tough clay that is liable to "check," and slow to dry.

The great circulation of air does it, as of out of door drying, at low temperature. The correct principle, successfully adapted and demonstrated. Saves more time than the locomotive over the stage coach; with fans and machinery, inside and close to the work, that pay well and cost no trouble to run, as users attest.

The fans save in cars, pipe and enclosure to make the first cost less than half that of other dryers, and in continuous use less than one-fourth of the fuel in using engine exhaust steam only for heating—much more of it, and without back pressure.

SOMERSET, MASS., Nov. 22nd, 1897.

TO WHOM IT MAY CONCERN:

This is to certify that S. G. Phillips' "Inside Fan Dryer," has been in operation at our works for a period of over a year, and continues to give good satisfaction, drying our pressed brick for enamelling in ten hours without warping or checking.

A vacuum gauge at the feed water heater shows our variable cut-off engine to be made condensing, and it is safe and not over estimated in any point of view, to say the Dryer is working all right and costing no extra power or firing, as we do our former work and yet are saving 20 per cent. in our fuel bill.

No heating means is employed other than the exhaust steam from the engine, and that which the radiators do not take, passes on to the stove or dry floor, being used as before.

The above drawing, showing the general arrangement of the feed water heater, gauges, exhaust steam pipes, valves and two dryers, is in all essential respects, correct.

SOMERSET ENAMELED BRICK CO.,

By Warren H. Sanford, Agent.

BRISTOL COUNTY, SS. Nov. 22nd, 1897.

Then personally appeared Warren H. Sanford above named and made oath that the foregoing statement by him signed is true.

[SEAL]

Before me,  
J. C. BLAISDELL, Notary Public.

S. G. PHILLIPS Agent and Patentee, 161 Grand Street, Rahway, N. J

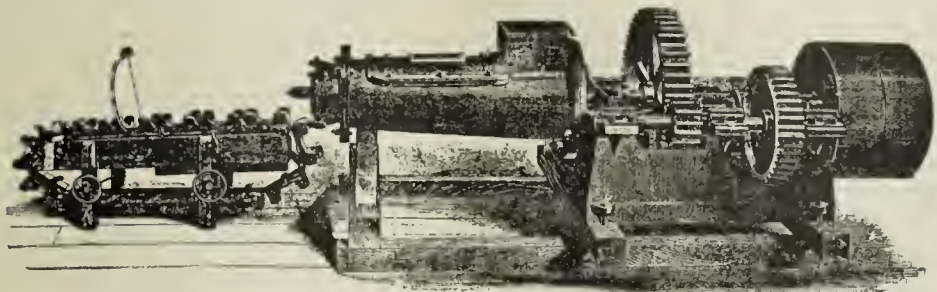


# MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers  
... of

## Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

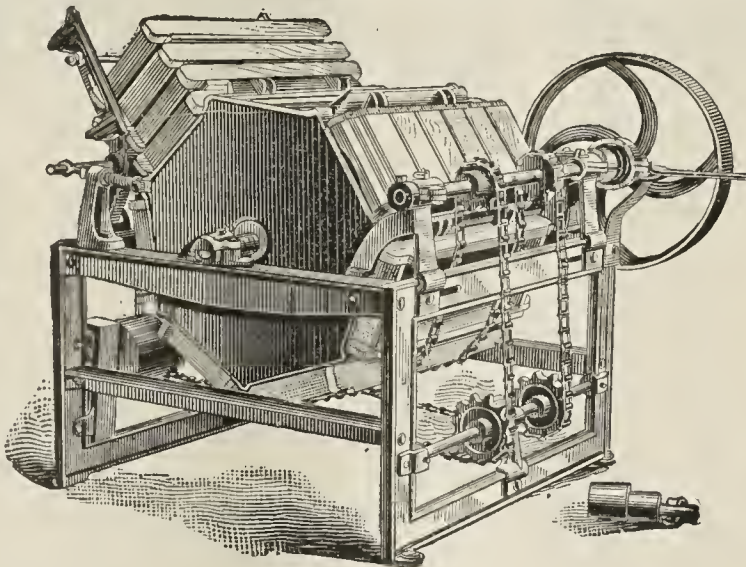
MADDEN & CO., Rushville, Ind.

### CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

**A. H. NEWTON,**  
Manager and Sole Agent,  
HAVERSTRAW, N. Y.



The case of Newton vs. Buck, has again been decided, February 4, 1898, by Judge Cox, in the United States Court, holding that Newton is the owner of patents, Nos. 284,115; 301,087; 272,698; and 407,030, and has the exclusive right to manufacture machines under these patents, and entitled to an injunction against Buck and all persons claiming through or under him, from making, using or selling the Buck machines, and for damages for past infringements. This is absolutely the end of the long litigation between Newton and Buck and every point is decided in favor of Newton.

We own and control nine patents, and all sanding machines employing either the cylinder or the feed rack, infringes some one or more of these patents, and all persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages against all infringements.

### Elevators

For handling  
CLAY,  
COAL,  
SAND,  
BRICK,  
TILE,  
PACKAGES.

Also Furnish  
RUBBER,  
LEATHER,  
COTTON  
BELTING.



## JEFFREY

Roller, Steel and Special CHAINS  
—FOR—  
**ELEVATING  
AND  
CONVEYING  
MACHINERY**  
FOR HANDLING MATERIAL OF ALL KINDS.  
Power Transmission Machinery.  
COAL MINING MACHINERY.  
WIRE CABLE  
CONVEYORS.  
For long and  
short distance  
conveying.

**THE JEFFREY MFG. CO., Columbus, Ohio.**  
Send for Catalogue. 163 Washington St., New York.

### Conveyors.

Manufacture  
SHAFTING,  
PULLEYS,  
HANGERS,  
GEARS,  
CLUTCHES,  
BUCKETS,  
BOOTS,  
BOLTS,  
Etc . . .

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H. W. FULLER, Ass't Gen'l Pass. Agent.  
Gen'l Pass. Agent, CINCINNATI, OHIO  
WASHINGTON, D. C.

What do YOU know about  
**Bricks, Tiling, Pottery?**  
WE know ALL about  
**SPLENDID LOCATIONS**

For the manufacturing of either of the above along the lines of the

### Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road.

For particulars write

J. ST. KOSLOWSKY,  
or Industrial Agt., St. Louis, Mo.  
E. W. LABEAUME,  
G. P. and T. A., St. Louis, Mo.



Solid Train Between  
**Sandusky and Peoria**  
—AND—  
INDIANAPOLIS and  
MICHIGAN CITY,  
FT. WAYNE and  
CONNEERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.  
\*No. 22 Passenger..... 1:20 p. m.  
No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

\*No. 21 Passenger..... 10:20 a. m.  
No. 23 Passenger..... 2:50 p. m.  
No. 25 Passenger..... 6:20 p. m.  
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Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on  
A. H. SELLARS, Agent,  
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C. F. DAILY, Gen. Pass. Agt.  
INDIANAPOLIS, IND.

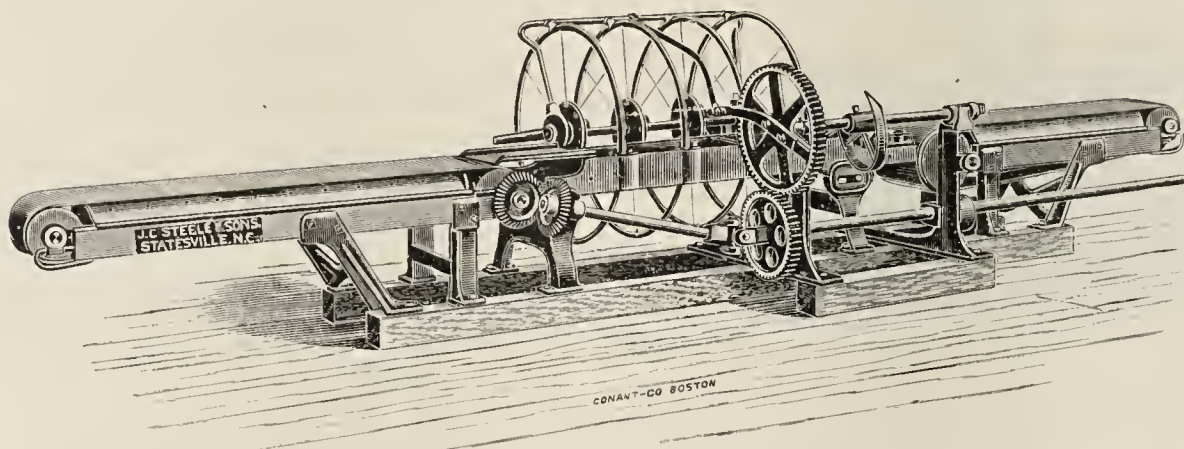
TAKE THE  
**BIG 4**  
TO  
**ST. LOUIS**



# The "New South" Brick Machinery

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.



Automatic Cutting Machine.

Bluff Springs, Fla., Dec. 9, 1897.  
J. C. Steele & Sons, Statesville, N. C.:  
Gentlemen:— We have been running your "Xtra" Machine with Automatic Cutter for sometime and they do excellent work. The Machine tempers clay beyond our expectations, and the Cutter, we believe is as near perfection as is possible to make it. Any one wishing a simple Machine and Cutter should investigate yours before placing their order. At any time we will be pleased to answer any questions in regard to them.

Yours truly,  
J. W. CRARY, JR., & Co.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

## The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

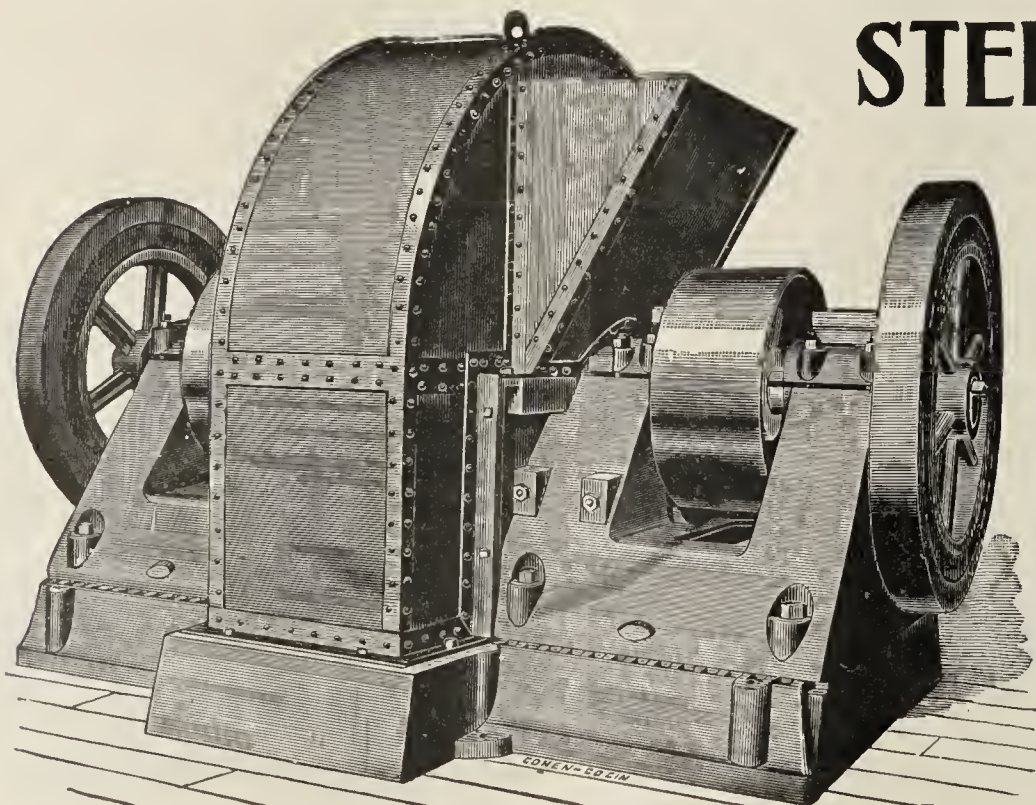
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



## STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly  
Pulverizing Clay in a  
Dry, Semi-Dry or  
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

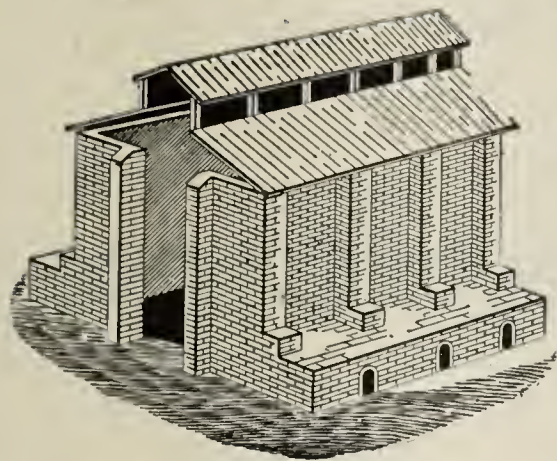
Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.



Mention the CLAY-WORKER  
WHEN WRITING TO ADVERTISERS,  
Mention the CLAY-WORKER.



Up-Draft Kiln.

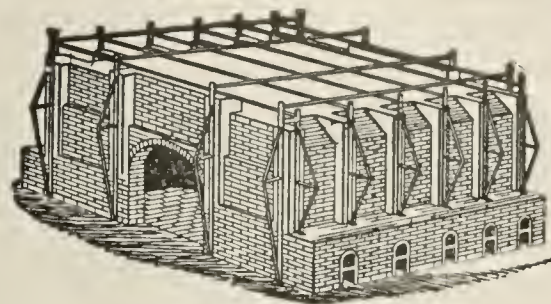
## LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.  
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

# The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

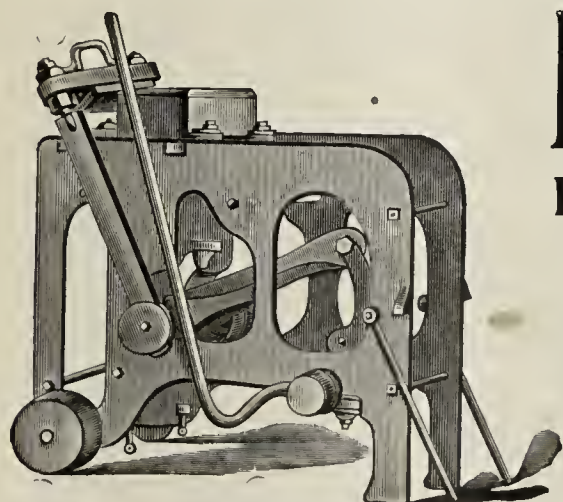
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

Days Brick Works.

— BELLEVILLE, ILL.



RED BRICK PRESS.

**GEORGE CARNELL,**

Nos. 1,819, 1,821 and 1,823 Germantown  
Avenue and Fifth Street,

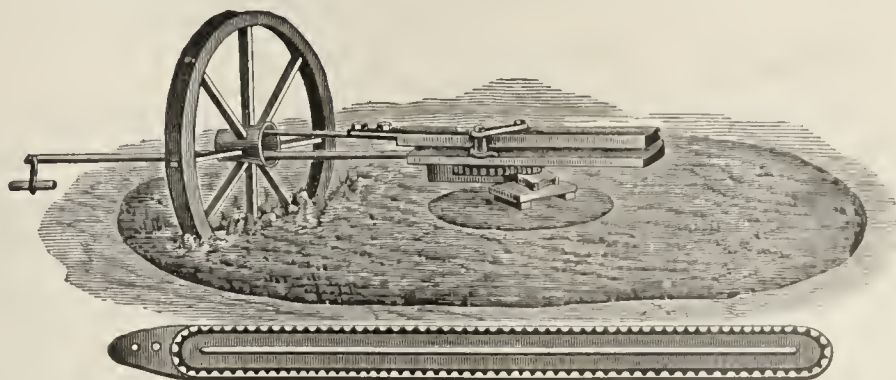
PHILADELPHIA, - - - PENN.

## PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.



# HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

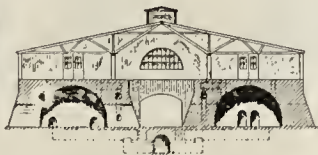
On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



WOULD like to show you also my new Kiln Floor for Round or Square Down-draft Kilns. It is a permanent floor, to any one who has to use sand in sanding their brick it is a money saver, a floor can be cleaned in two hours without moving any brick; and fuel is saved in the burning of the product, and a great deal of annoyance saved in leveling etc., for dry pressed and other high grades of brick.



Address H. HAIGH, Catskill, N. Y.

## The Lehmann <sup>Portable Continuous</sup> Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

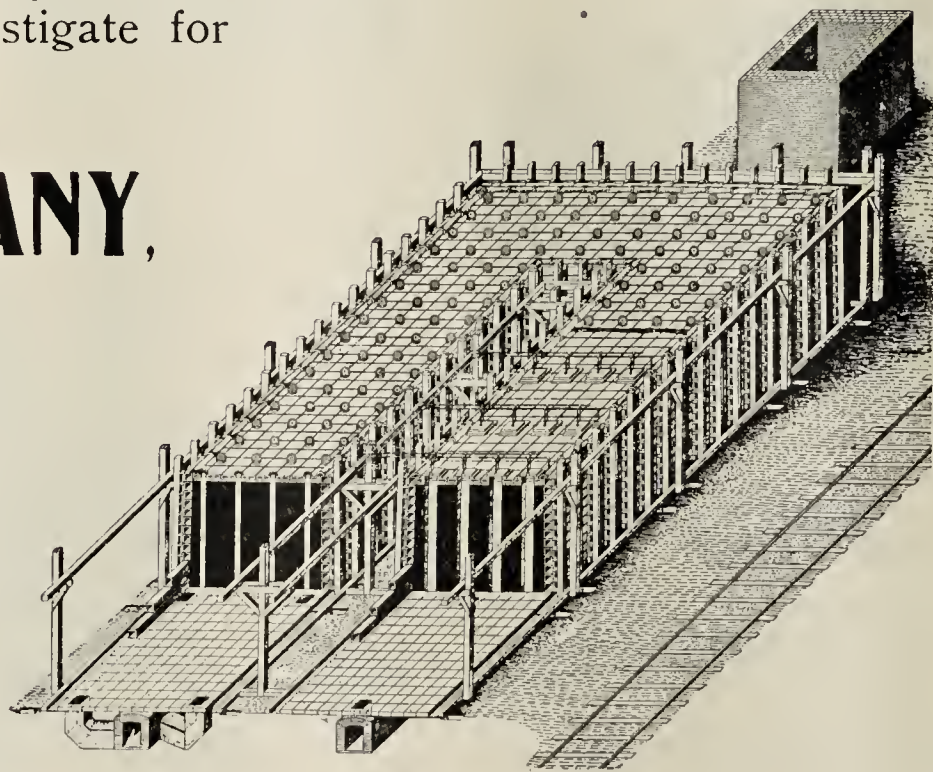
### F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,  
Plans and estimates furnished for Brick, Lime and  
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.





# Morrison's Latest

## Improved Kiln,

### FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

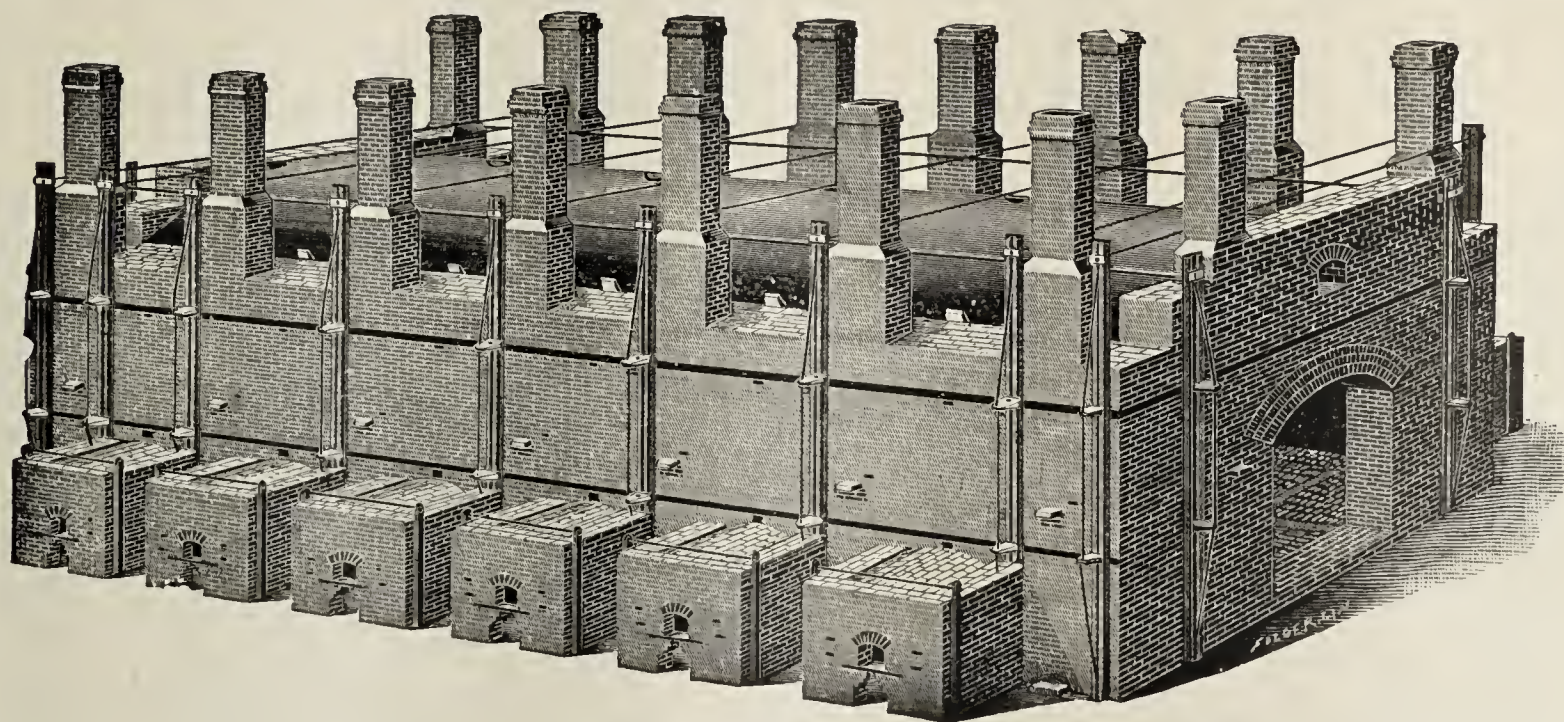
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

## The EUDALY

IMPROVED —  
DOWN-DRAFT KILN  
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

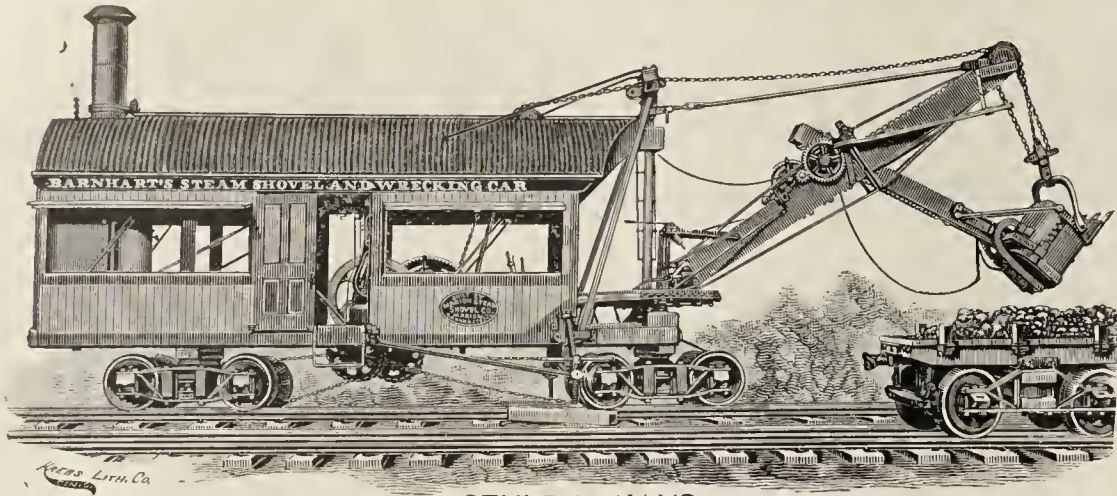
We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

**W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.**



# Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

**The Marion Steam Shovel Co.,**

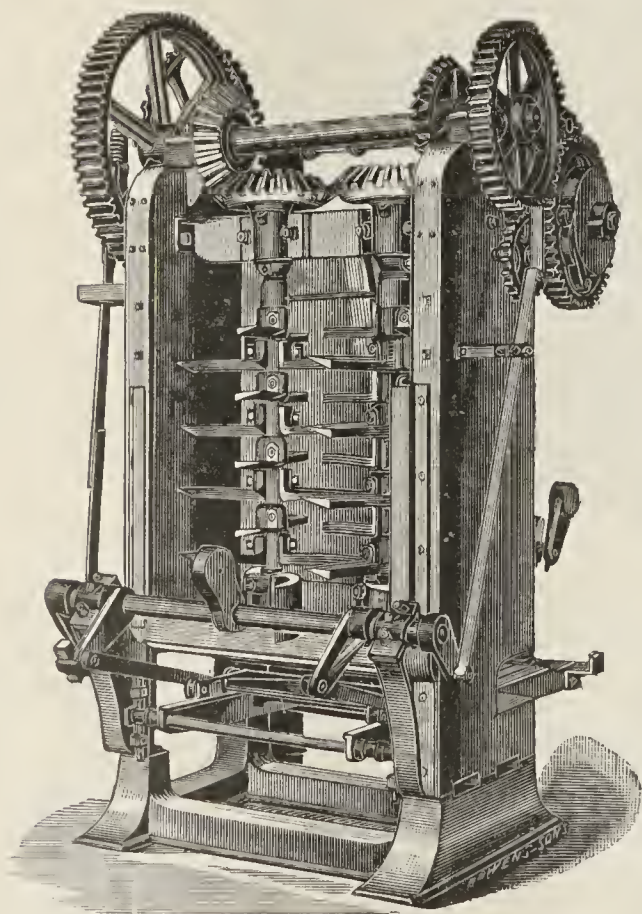
603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

## THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



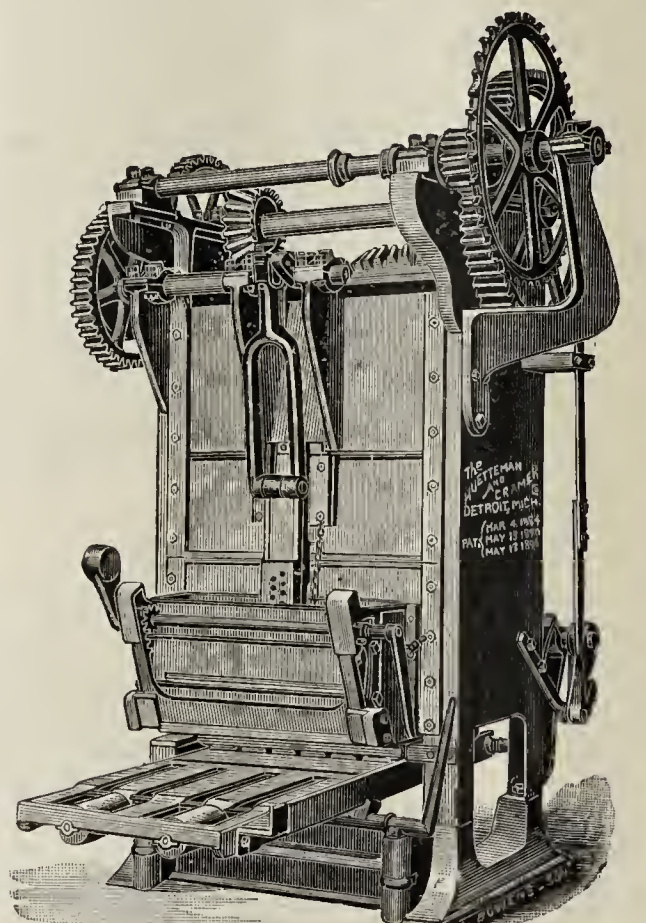
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE  
AND PRICES TO

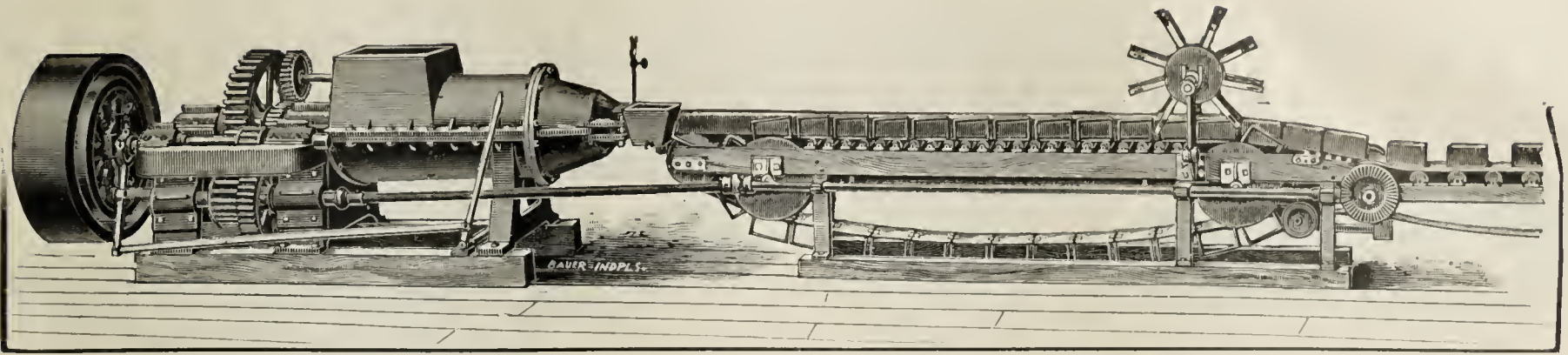
**The Huetteman  
& Cramer Co.,**

Manufacturers of the Duplex Brick Machine and general outfit for  
brickyards,

12, 14 & 16 Sherman St.,  
**DETROIT, - - MICH.**







OFFICE OF  
THE TUTTLE BRICK COMPANY,  
Manufacturers of

## Paving and Building Brick.

Decatur, Ill., January 28th, 1898.

LEADER MFG. CO., Decatur, Ill.

Gentlemen:—We have been using a complete outfit of your brick machinery, with the exception of Represses, for several years. Each individual machine has performed its work in a manner highly satisfactory to us.

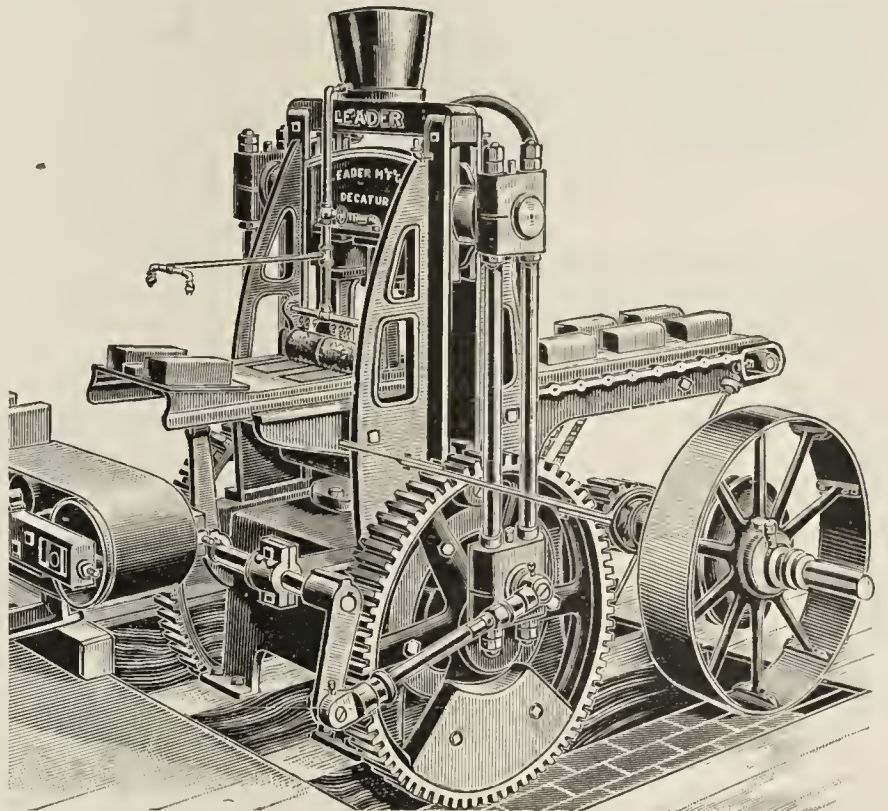
The Repress you furnished us last year has been doing the work usually allotted to two presses without signs of detriment to it and you may expect an order from us in a few days for another LEADER REPRESS.

It has paid us to use your machinery in the past and we will continue to do so in the future. Wishing you success, we are,

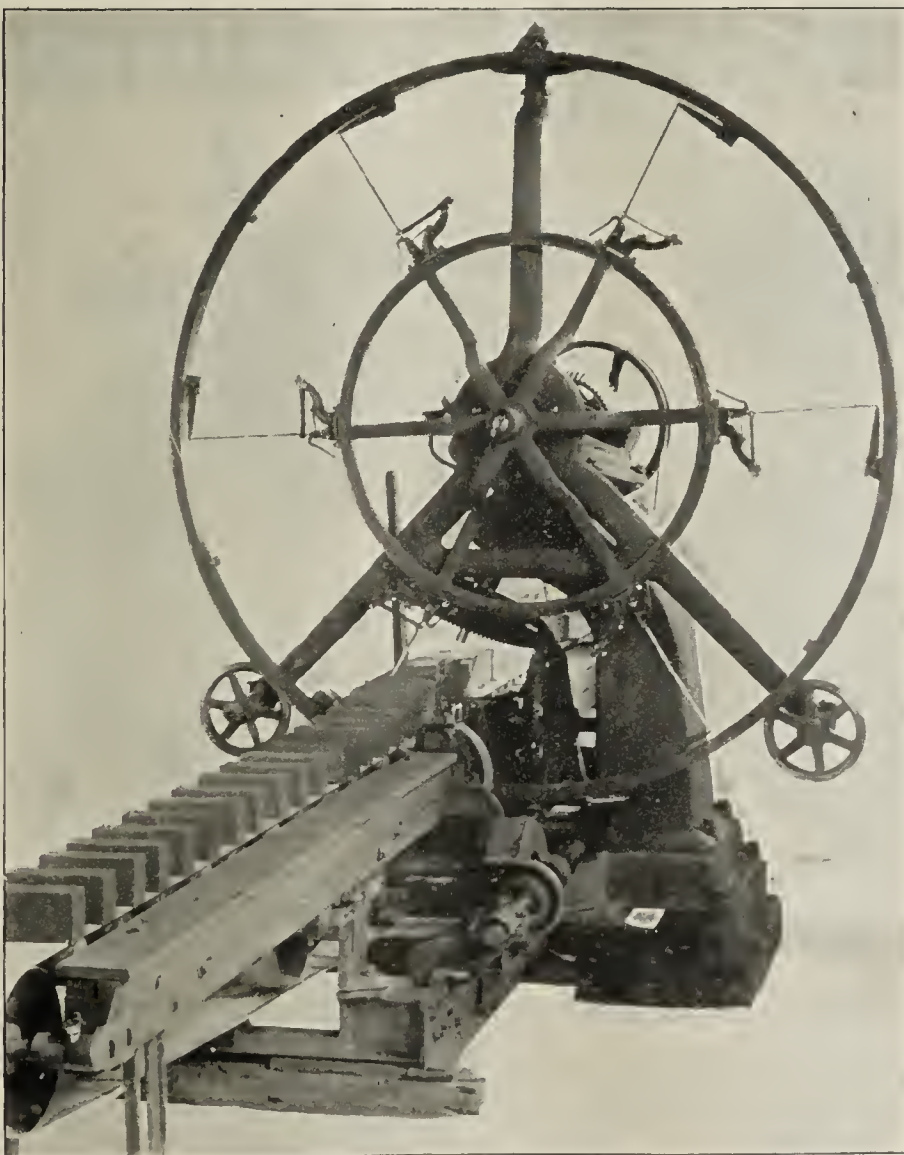
Yours truly,  
THE TUTTLE BRICK CO.,  
Per S. A. Tuttle.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

**Leader Manufacturing Co.,**  
Decatur, Ill.



## Automatic Side-Cutter For Stiff-Tempered Brick Machines.



The Chambers Automatic Side-Cutter.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

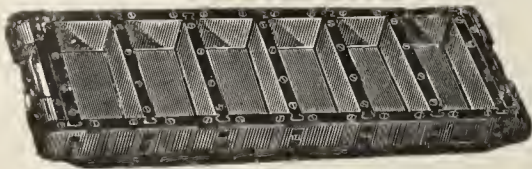
The machinery is above the dirt and all gearing encased.

MANUFACTURED and  
GUARANTEED. . . .

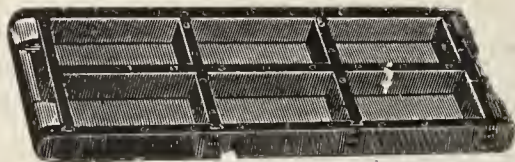
**Chambers Brothers Co.,**  
PHILADELPHIA, PA.



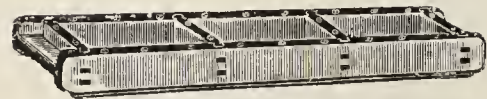
# DO YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see!"

We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

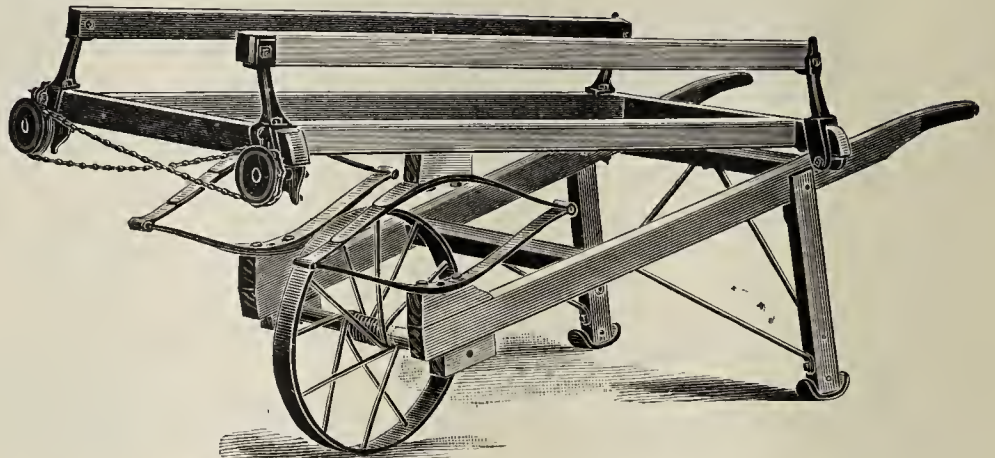
future delivery desired now. We make the best

➔ Moulds, Trucks  
and Barrows,

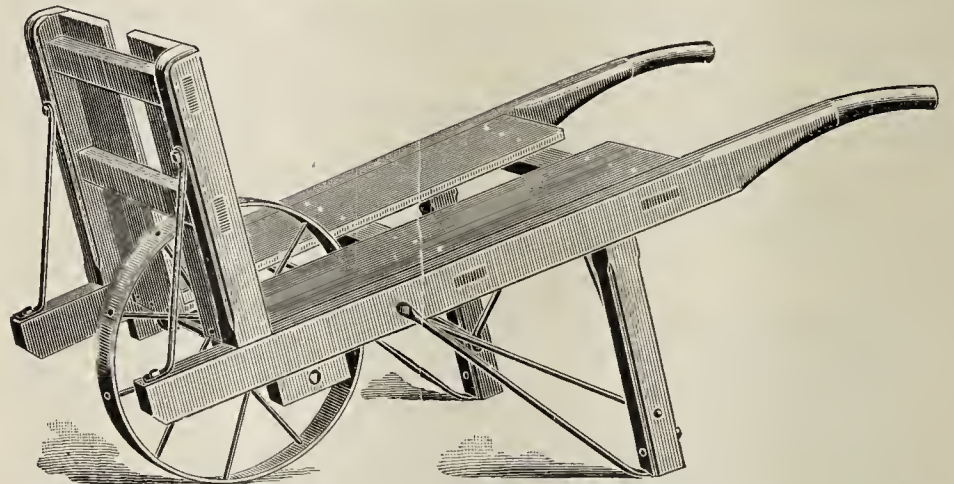
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



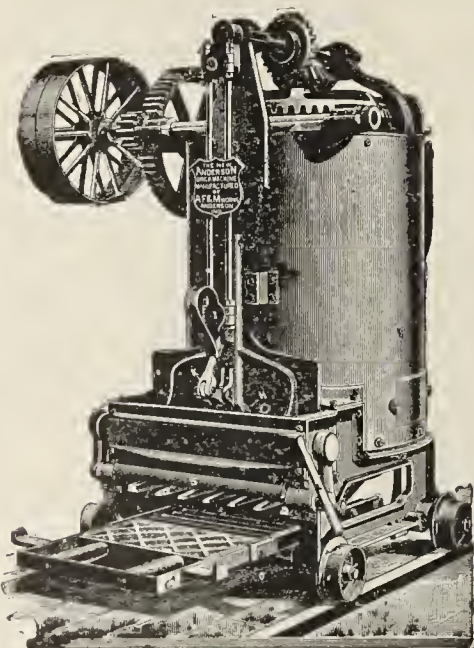
No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00  
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

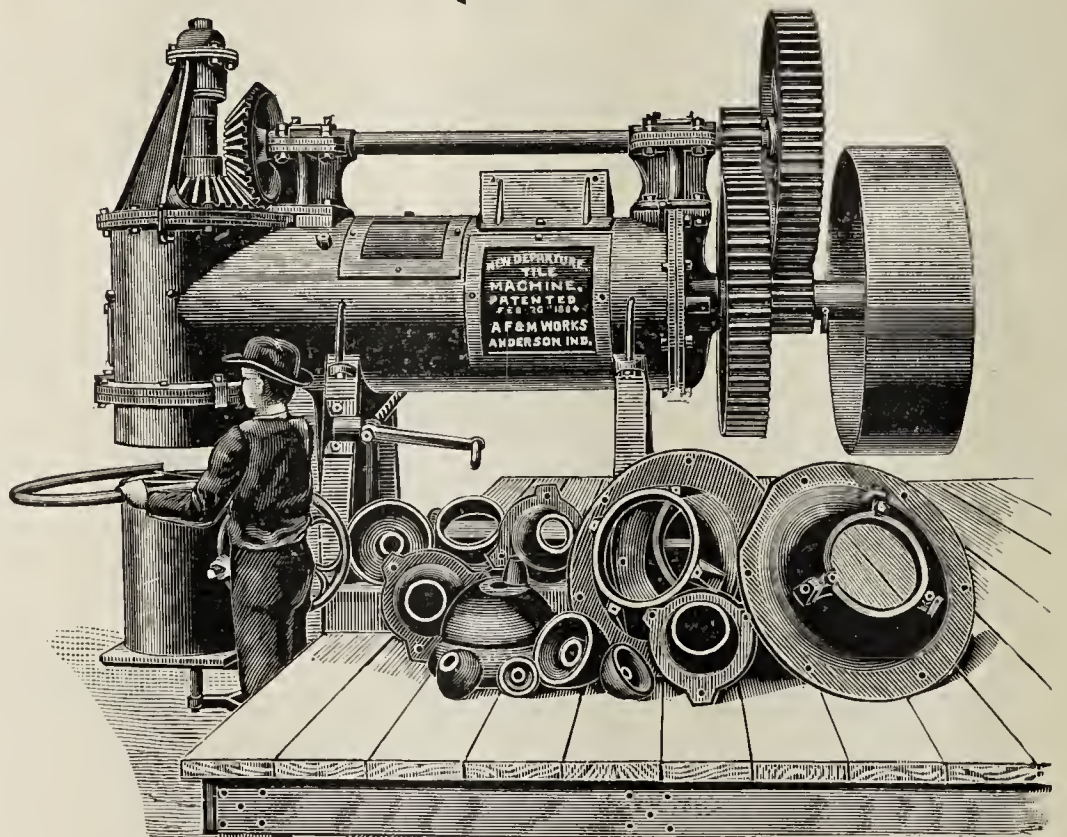
## New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.  
Steam Power.

Write  
for  
Catalogue  
and  
Prices.



NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana



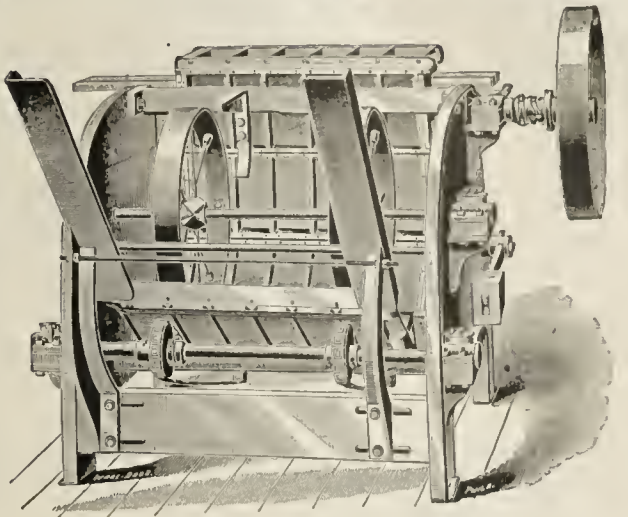
# See What One of Our Customers

Says of the "Hercules."

This machine is simple in construction, powerful in operation, and practicably non-breakable, cannot fail to lead the procession.

Will be glad to correspond with any one in regard to brick machinery.

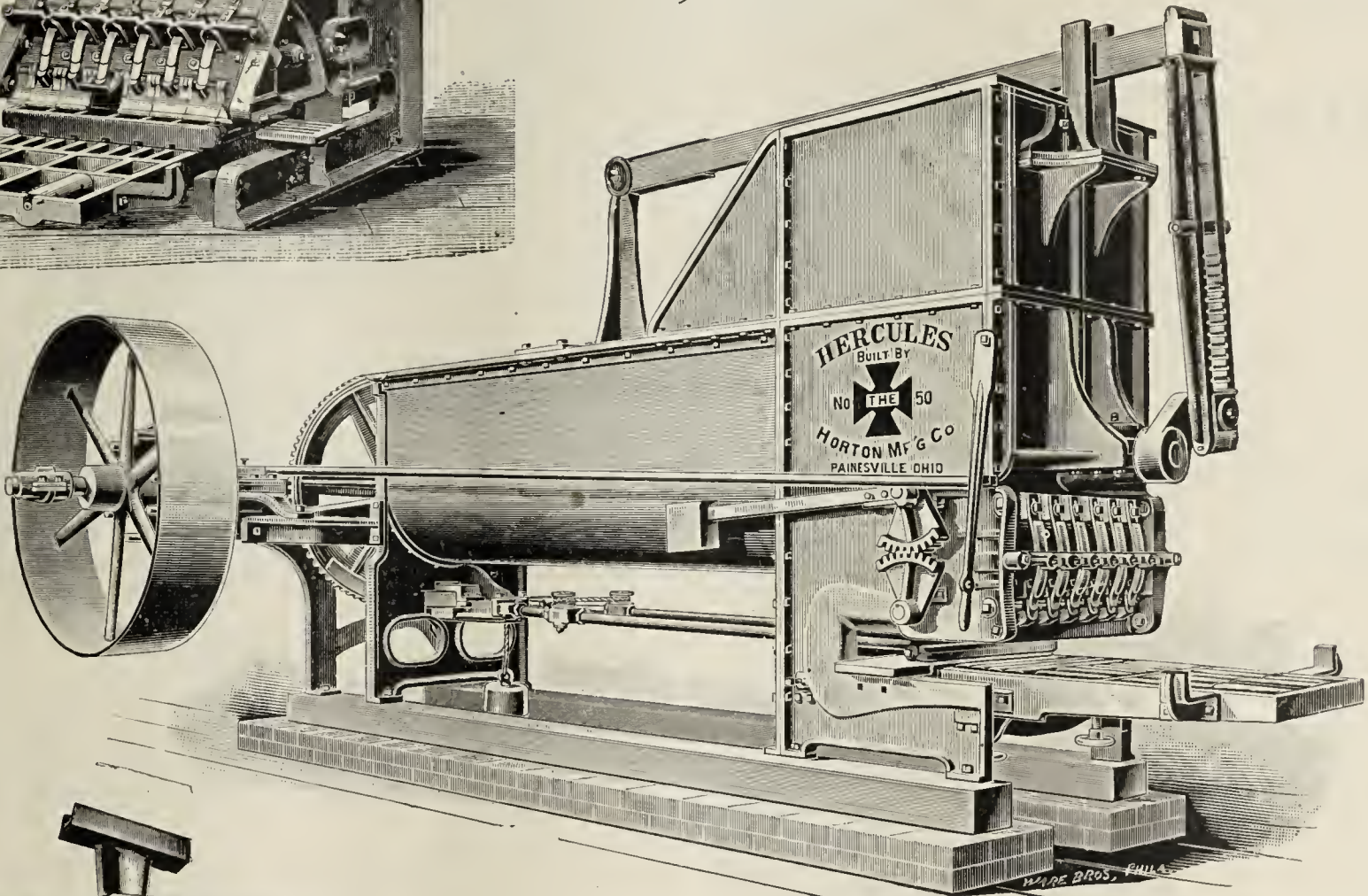
SEND FOR  
'98 CATALOGUE.



HORTON MOLD SANDER DIRECT FEED.



Standard  
"Special"  
Heavy  
Steam  
Power.



Hercules capacity 40,000  
to 50,000.  
Weight 7½ tons.

We are making a special drive on Molds this season. Send for our new circular on molds.

FRANK DUDENHOEFFER,

Manufacturer . . . of **BRICK,**

130 West 24th Street.

HORTON MFG. CO., Painesville, Ohio.

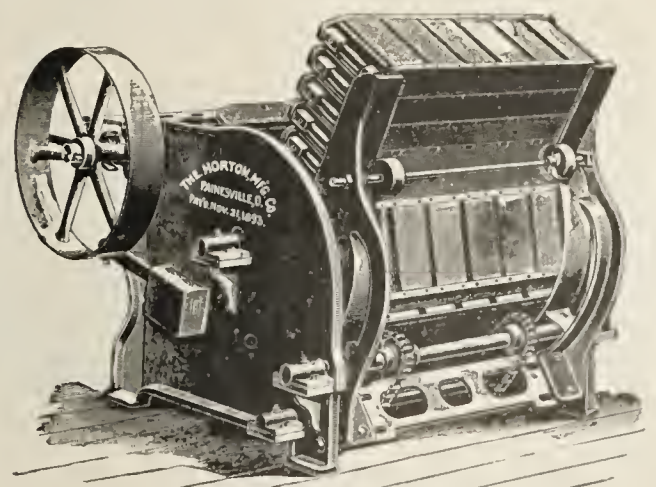
Gentlemen:—I have had your Hercules brick machine in operation for sometime, and wish to say that it makes the best square brick in the market, and it runs easiest of any brick machine that we ever saw. I save \$2 in coal every day I make brick and it will make from 30,000 to 50,000 brick in ten hours without any inconvenience, the only trouble I have is getting clay enough to the machine.

It does more than I expected and I think that you have the finest machine on the market and you will have no trouble in selling them. If any body wants to see how the machine works, send them up to my brick yard and they can convince themselves of what I say.

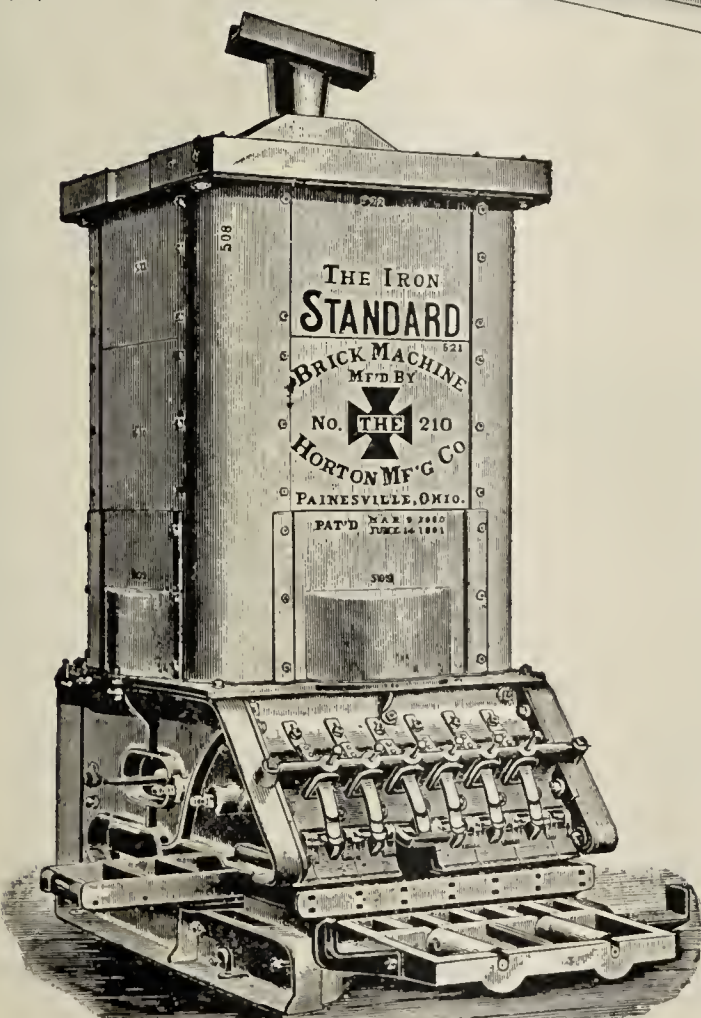
Very respectfully yours,  
FRANK DUDENHOEFFER.

The Horton  
Manufacturing  
Company,

PAINESVILLE,  
OHIO.



THE AUTOMATIC FEED MOLD SANDER.



IRON STANDARD HORSE POWER.





"No stain upon its honor,  
No scar upon its shield."

# The American Eagle.

**War is Imminent,  
Freedom is Assured!**

Uncle Sam, even in these days of turmoil, recognizes the importance of the Eagle. In this respect Uncle Sam and thousands of brick manufacturers are of the same opinion. They stoutly maintain that the Eagle has no equal. The Eagle means war! It means war against constant repairs. The Eagle means freedom! A freedom from annoying and expensive delays, freedom from poor brick and the emancipation of the brickmaker who has been a slave to disappointing machinery. Wherever you find an Eagle you find a satisfied owner, who is proud of the Eagle.

If you want the best repress your contract should call for an Eagle. More in use than all other represses. They never wear out and need but few repairs. Always ready for duty. The more duty the better suited. Every day sees more Eagles go into use; the more they're known the better they're liked. Let us tell you the story of their worth. Write for particulars. To-day's the time, to-morrow never comes.

We manufacture a full line of Dry Press, Stiff Mud and Soft Mud Machinery. Every machine is "Built Right and Runs Right." Send for information, prices and terms. If you haven't it send for our complete catalogue.

**The American Clay-  
Working Machinery Co.,**



**BUCYRUS, OHIO, U. S. A.**

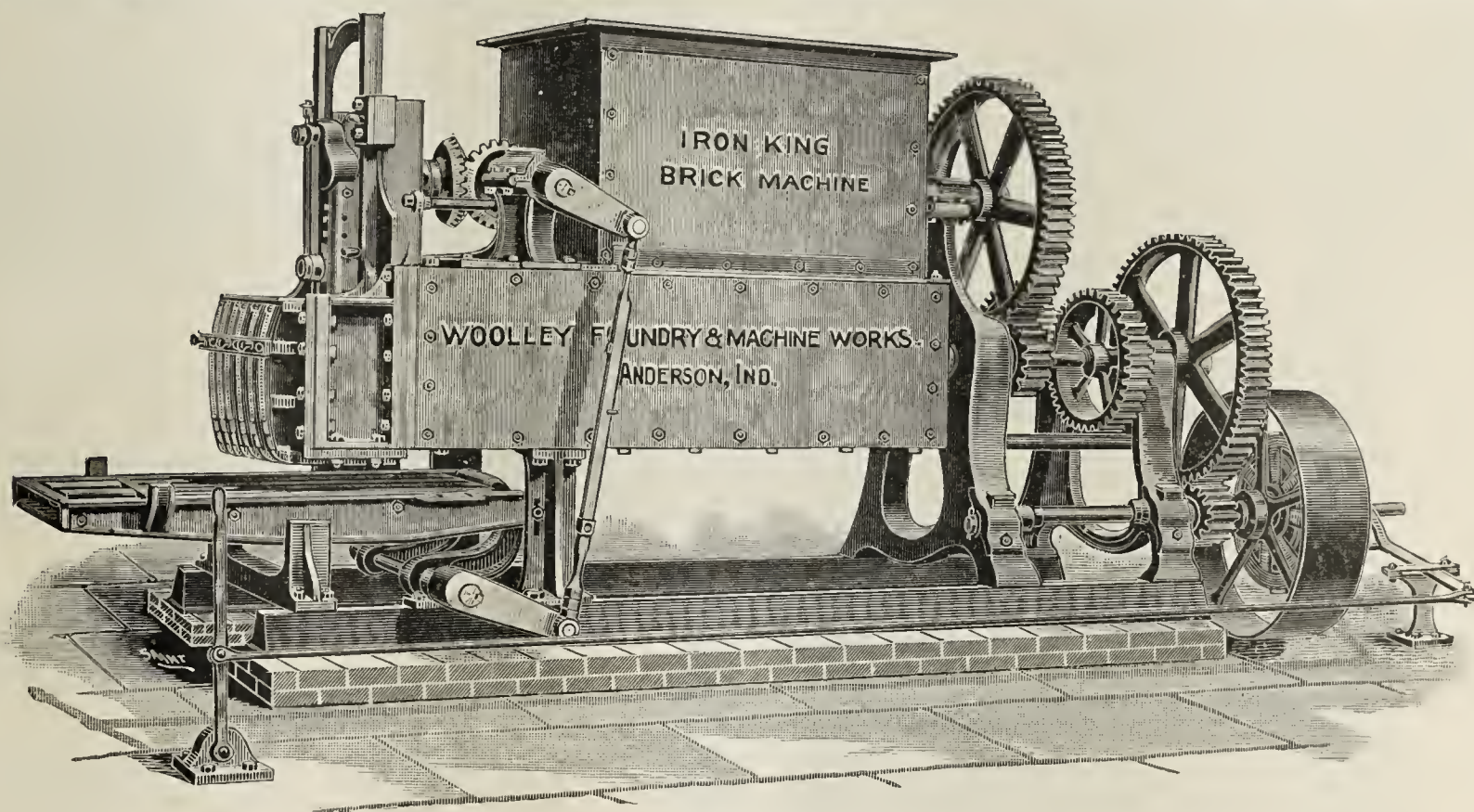




# SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our "IRON KING" Brick Machine is made on correct mechanical lines and of material that will "stand the racket" right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

**WOOLLEY** DRY PANS,  
PUG MILLS,  
SLIP PUMPS  
and PRESSES

Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US  
PLEASURE TO QUOTE  
YOU PRICES. . . .

Mention the Clay-Worker.

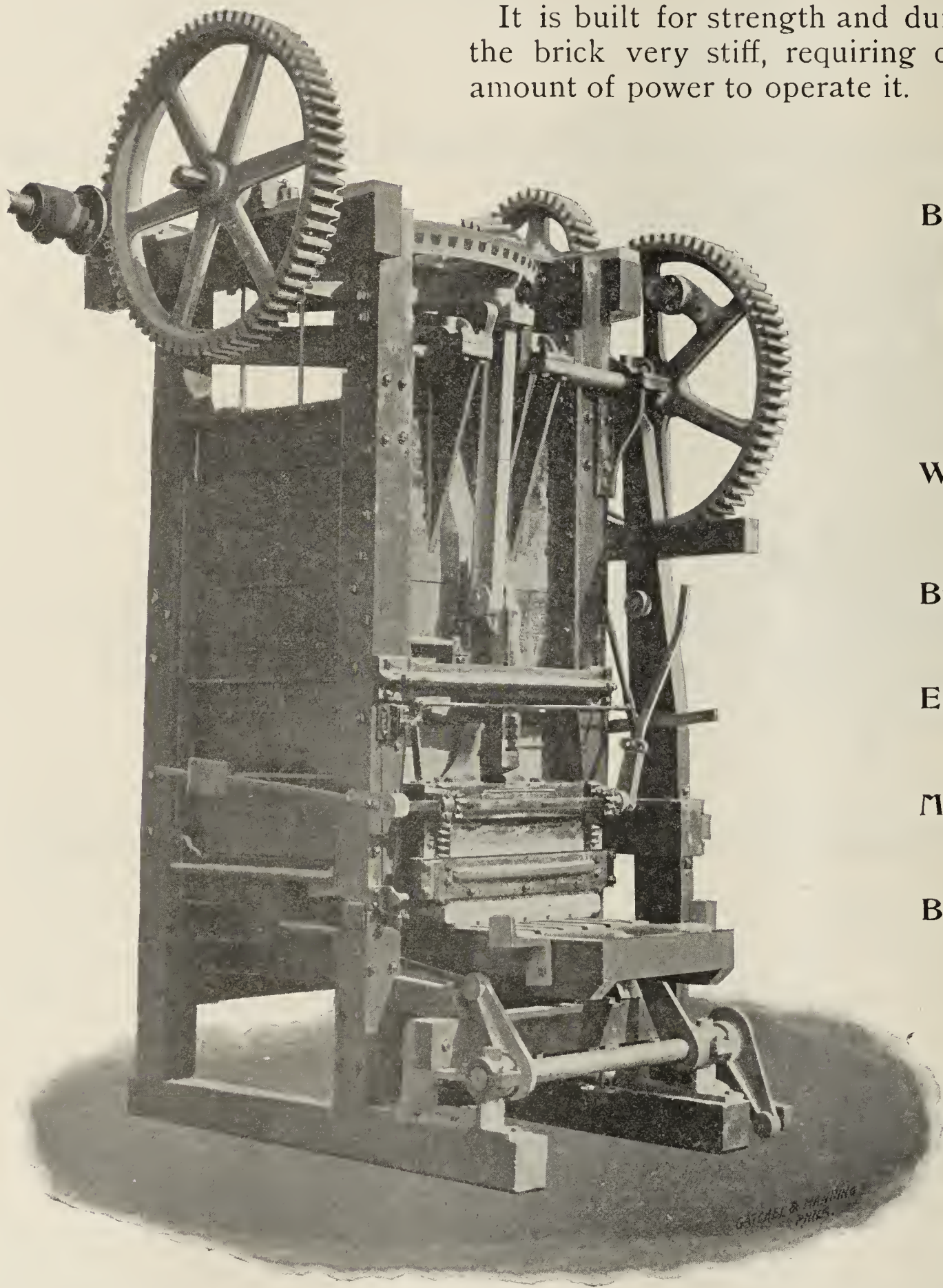




# The Favorite Stock Brick Machine.

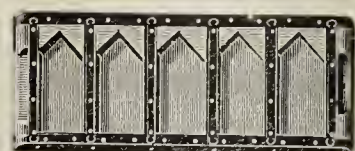
Weight 10,500 Pounds.

It is built for strength and durability, and to mould the brick very stiff, requiring comparatively a small amount of power to operate it.



• • •

## BRICK MOULDS



....a Specialty.

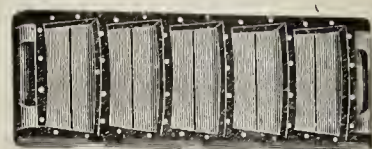
• • •

We furnish everything  
a Brickmaker needs.

• • •

Brick Machines,  
Pug Mills,  
Clay Crushers,  
Elevators,  
Sand Grinders,  
Mould Sanders, etc.  
Machine Moulds,  
Hands Moulds,  
Wheel Barrows,  
Brick Trucks,  
Sand Dryers,  
Dump Cars,  
Dryer Cars,  
Kiln Castings, etc.

• • •



ALL SIZES. ALL SHAPES.

Send for our 1898 Catalogue and mention anything you need.

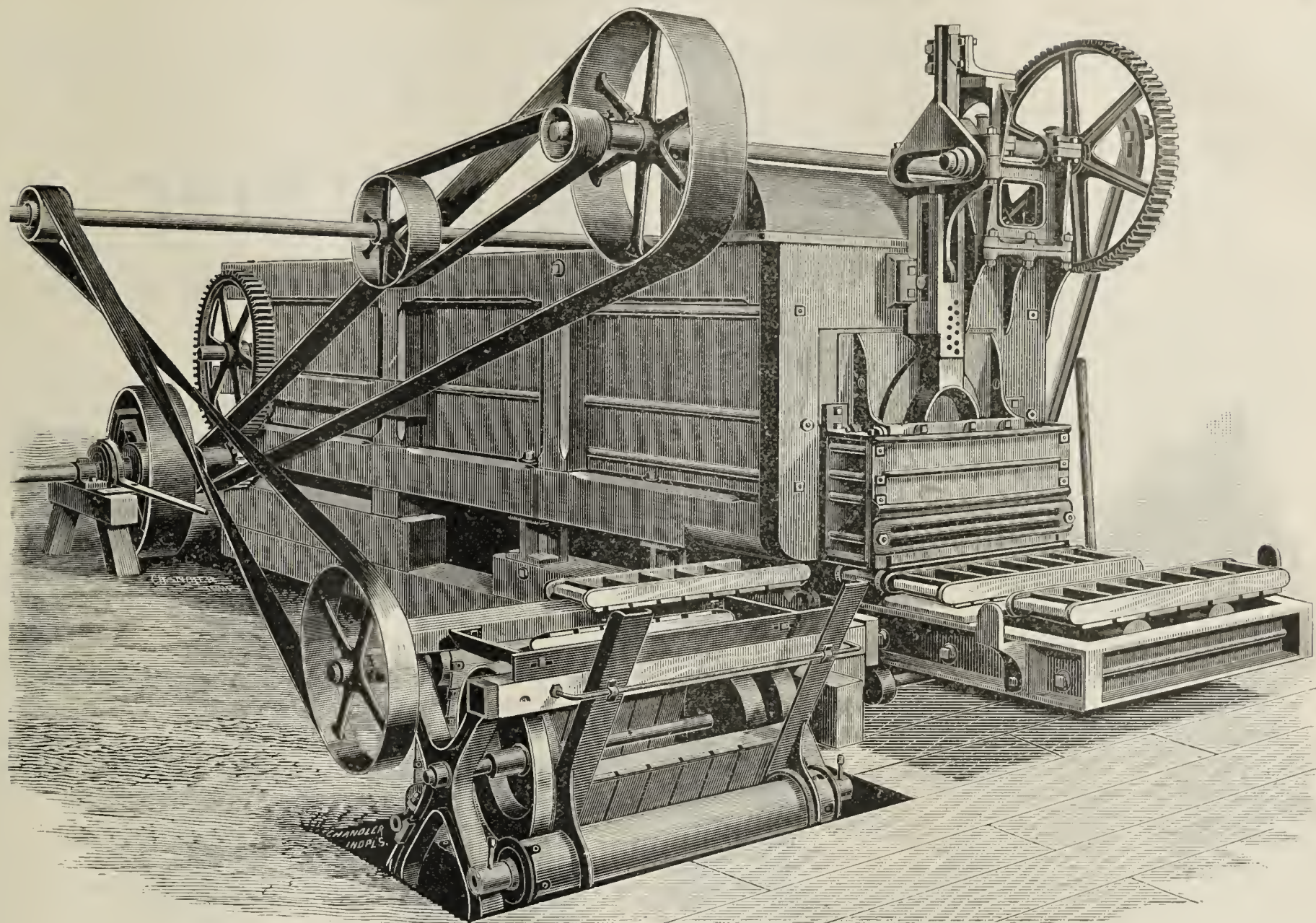
## The Henry Martin Brick Machine Mfg. Co.,

OFFICE AND WORKS: 552 No. Charlotte St.

LANCASTER, PENN.

Postal Telegraph-Cable Co. Direct wires to Factory Office.





And from every State in the Union we have any number of just such letters as the above.

.. THE ..  
**POTTS** Horizontal Stock  
 Brick Machine

*Is the LEADER.*

Hundreds of them are in use and every one giving entire satisfaction. We manufacture everything needed on the Brickyard. Now is the time to purchase your supplies for the coming season.

Brick Machines, Disintegrators, Mould Sanders, Granulators, Elevators, Cars, Winding Drums, Moulds, Trucks, Barrows and all Brick-yard supplies.

Our prices are low and terms liberal.

**C. & A. POTTS & CO.,**

816-828 West Washington St.,

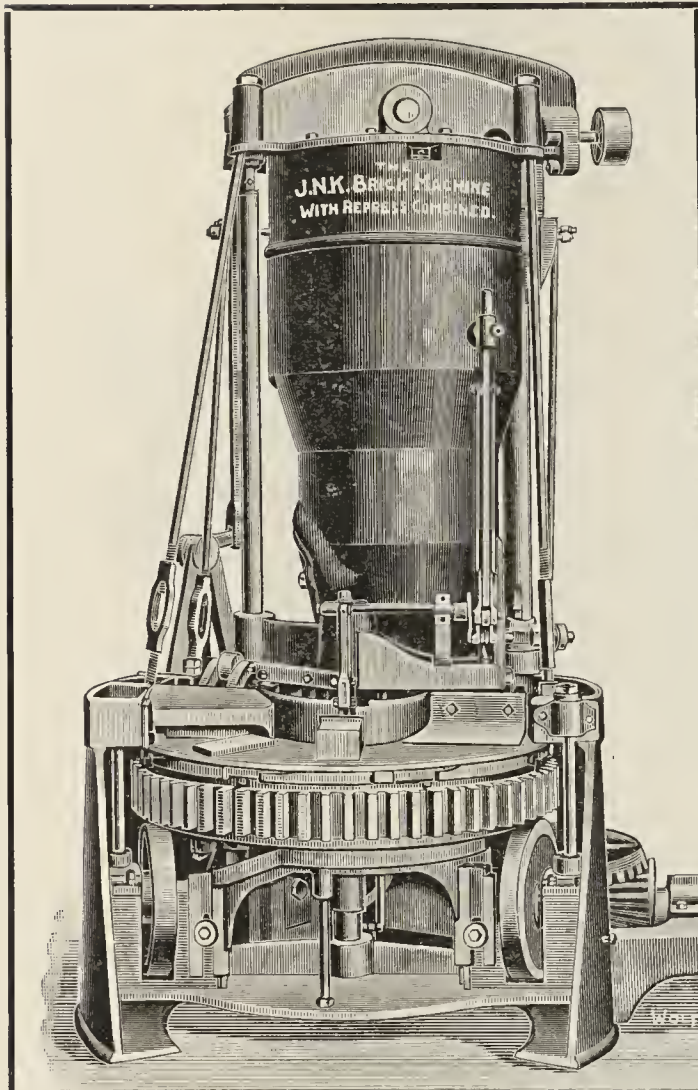
INDIANAPOLIS, IND.



# A GREAT IMPROVEMENT IN STIFF MUD BRICK MACHINES .....

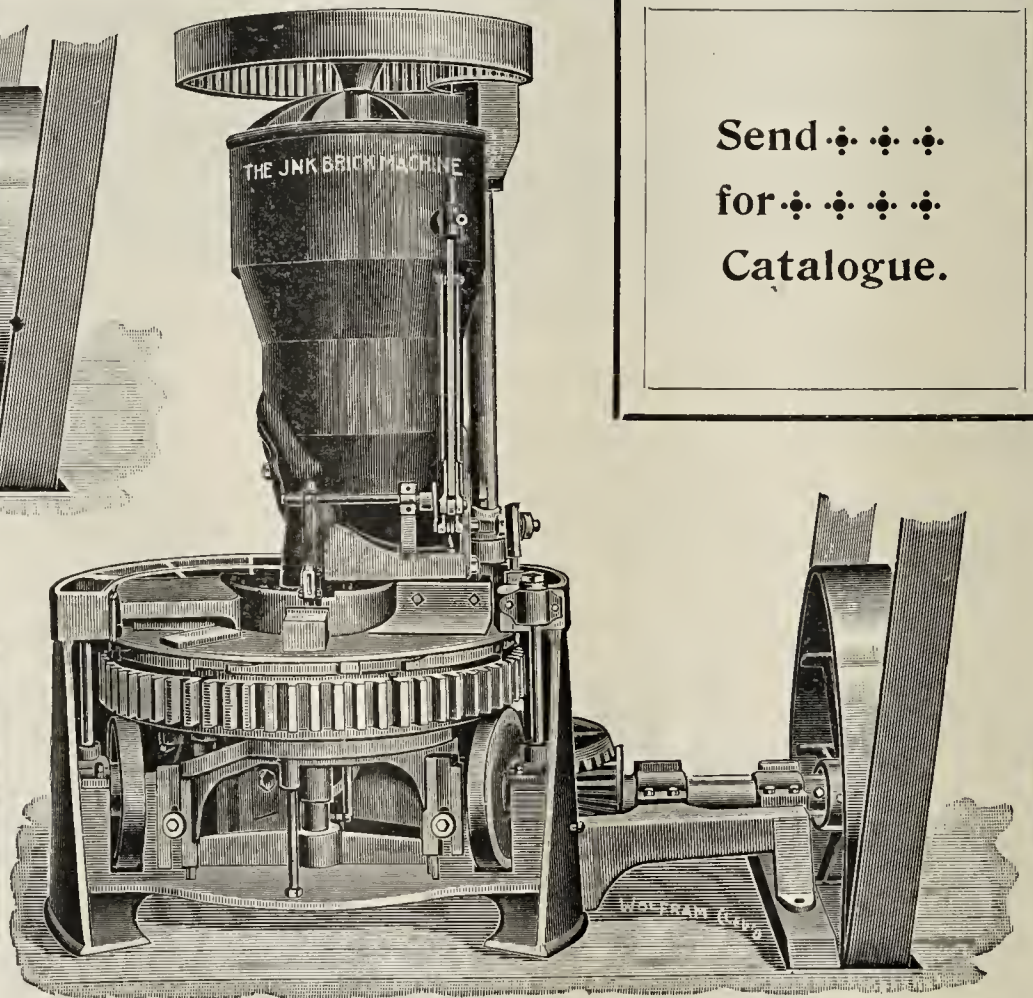
## The J. N. K. Brick Machine

With Repress Combined.



The J. N. K. BRICK MACHINE with  
Repress Combined.

THIS MACHINE has eight molds in the mold wheel, and the wheel revolves and brings the mold under the clay cylinder, where the molds are filled, then pressed to an even thickness, then comes the repress and represses them, next the brick is pushed out of the molds and onto a belt, then the mold is wiped and oiled and passes on under the clay cylinder again; now you have followed one mold around, and have made eight brick, now you can see as one brick is being made, one is pressed and one is repressed, one pushed out and one pushed off, and one mold wiped and oiled, and the repress is wiped and oiled every time it makes a brick, by these combined movements there is no time lost as 45 brick are made in one minute, and repressed and pushed off, and the molds wiped and oiled in the same minute, as all these movements act at the same time. With this machine fine re-pressed brick can be made as cheap as common brick.



The J. N. K. BRICK MACHINE without Repress.

Send ♦ ♦ ♦  
for ♦ ♦ ♦ ♦  
Catalogue.

### The J. N. K. Brick Machine

Without the Repress will make 60 brick per minute, square, even in thickness, smooth top and bottom, sharp corners and edges, parallel in thickness, a good nice-looking brick, the mold is wiped out and oiled, and the brick are made the same as the brick on the repress machine, and the movements are the same, except the repress taken out, and it can readily be seen what I mean by a great improvement in stiff mud brick machines. As I manufactured the P. L. Sword Machine for about 10 years and having heard of all complaints, and objections to it I started out four years ago, when I bought them out, and began to remove all these though it has taken me four years of hard work and thousands of dollars to accomplish it, the results are the J. N. K. Brick Machine has none of these objections, which were made against the P. L. Sword machine; namely, the press plate and cut-off knives are not used on the J. N. K., as the brick are finished under the cylinder. The molds, when first filled, are filled one half-inch fuller than you want the brick; this surplus half-inch of clay is pressed back, under a heavy pressure into the cylinder, and the pressure is kept on till the brick is finished, so there cannot be any shifting of the clay to one side. The J. N. K. has a thorough system of wiping and oiling the molds. I will further say to those that are using the Sword Machine and are in need of a new mold wheel, or any other repairs, I respectfully request a continuance or the liberal consideration, which was at all times shown to me, by those who purchased from me. Any one wishing further information on the J. N. K. Brick Machine or desiring a P. L. Sword Machine or any part thereof, address

## Central Machine Works,

JOHN N. KAUFHOLZ, Proprietor,

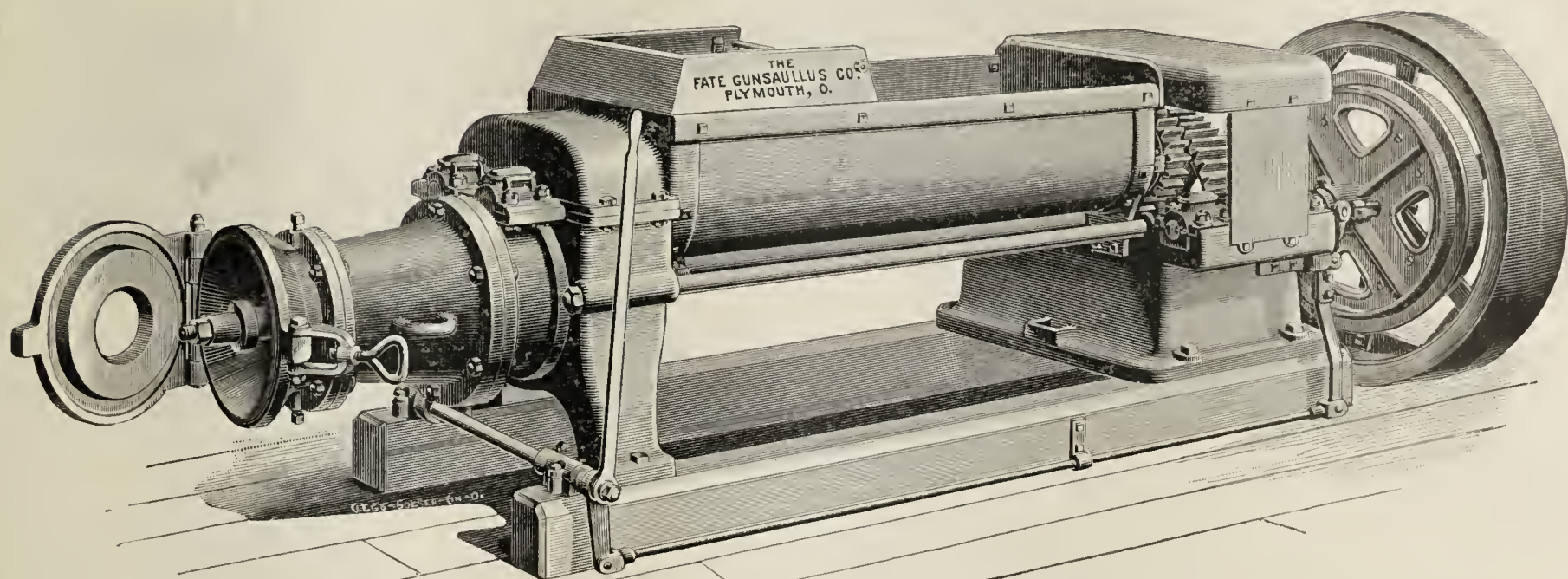
OFFICE AND WORKS:

226-236 Abbey Street.

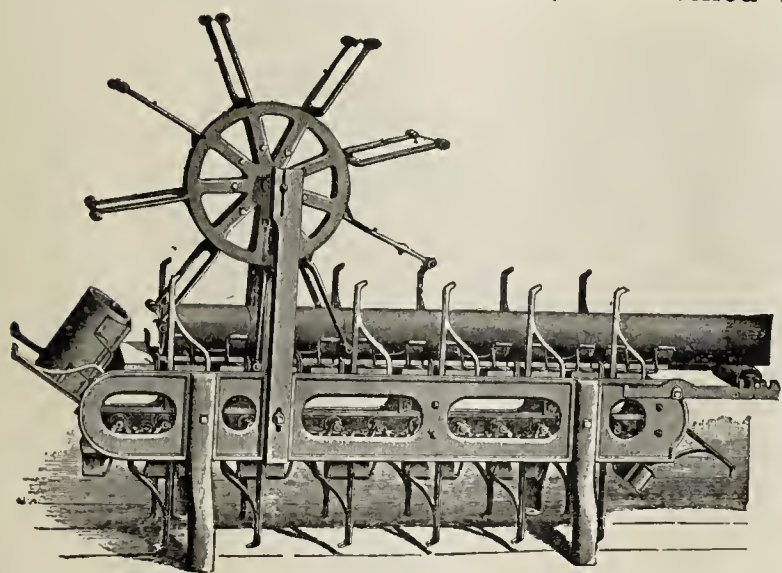
CLEVELAND, OHIO.



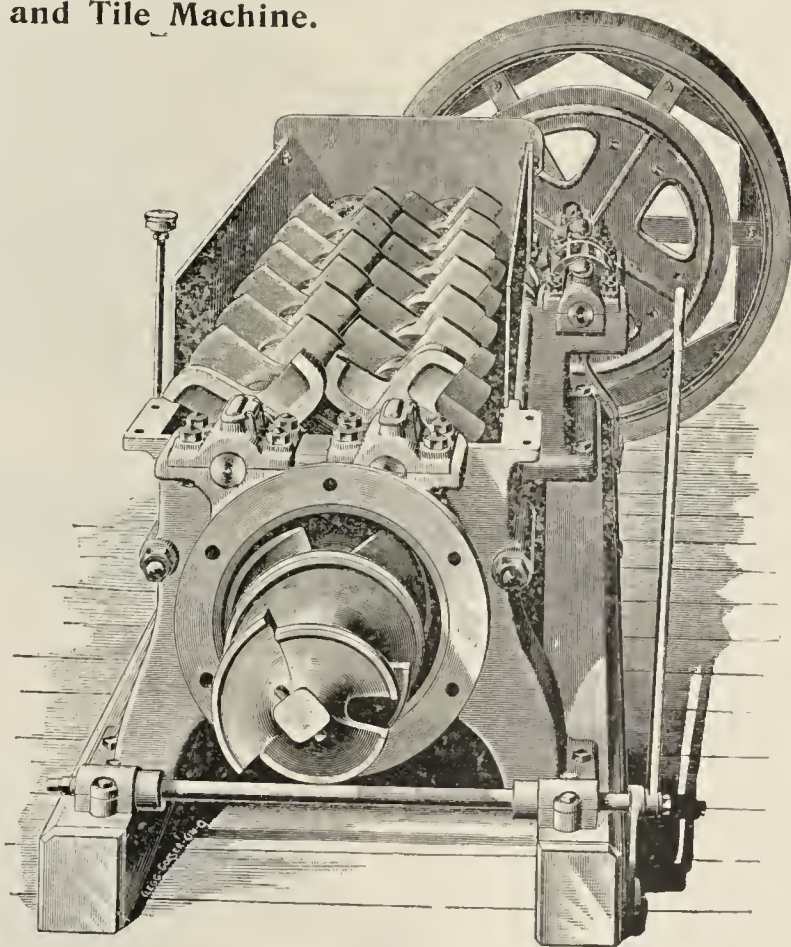
# The "PLYMOUTH."



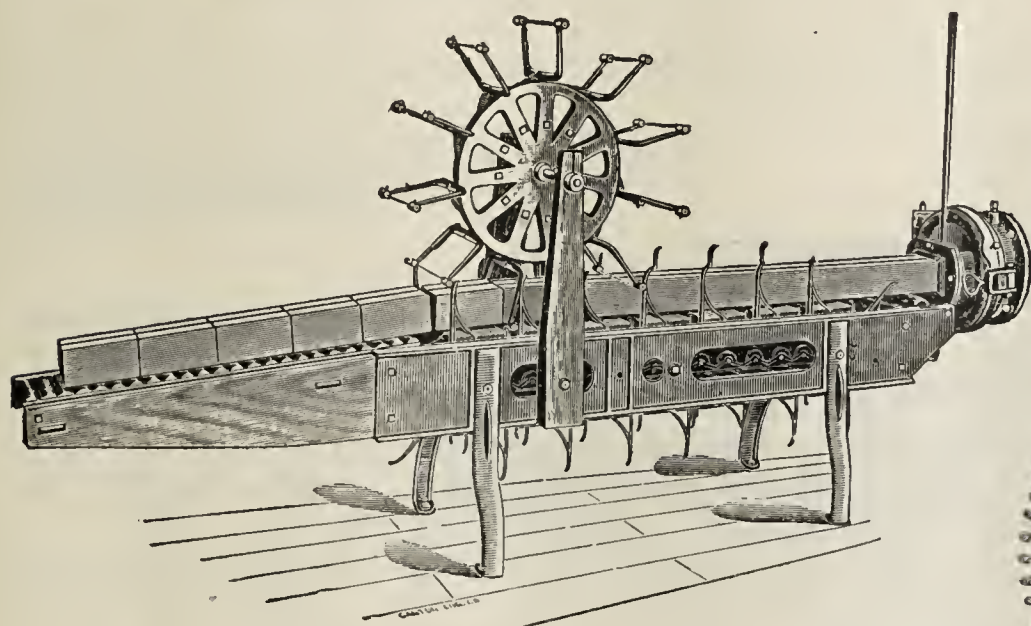
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



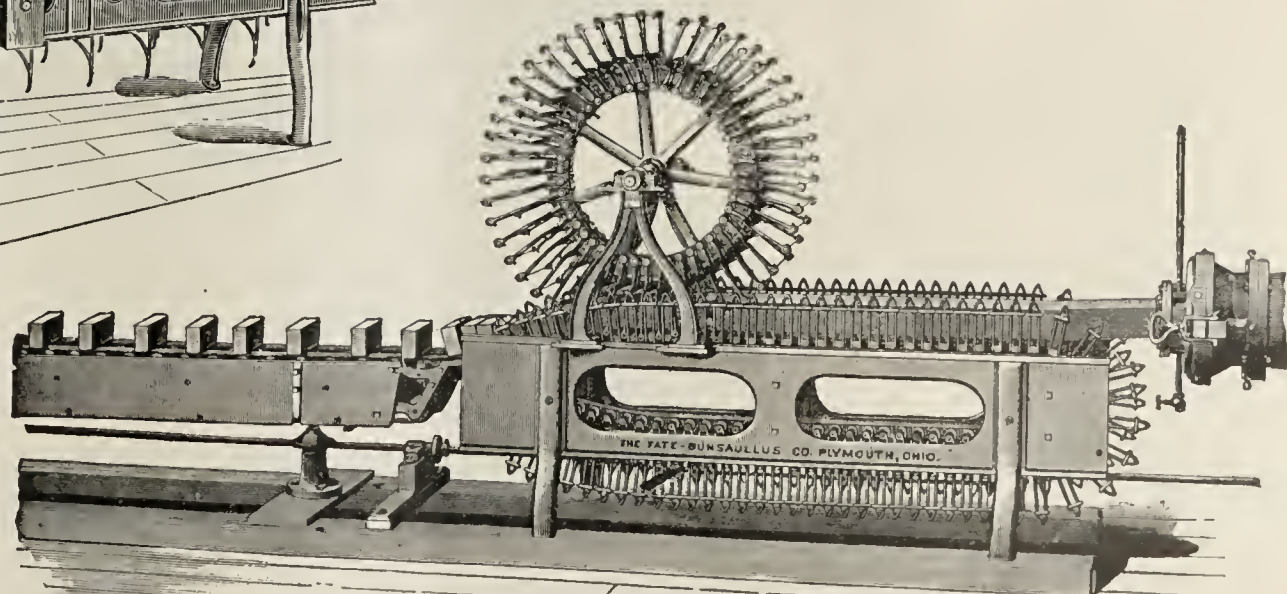
Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



"HUMMER" (Interior View.)



Automatic End-Cut Brick Table.



Automatic Side-Cut Brick Table.

Write for particulars to

**J. D. Fate & Co.,**

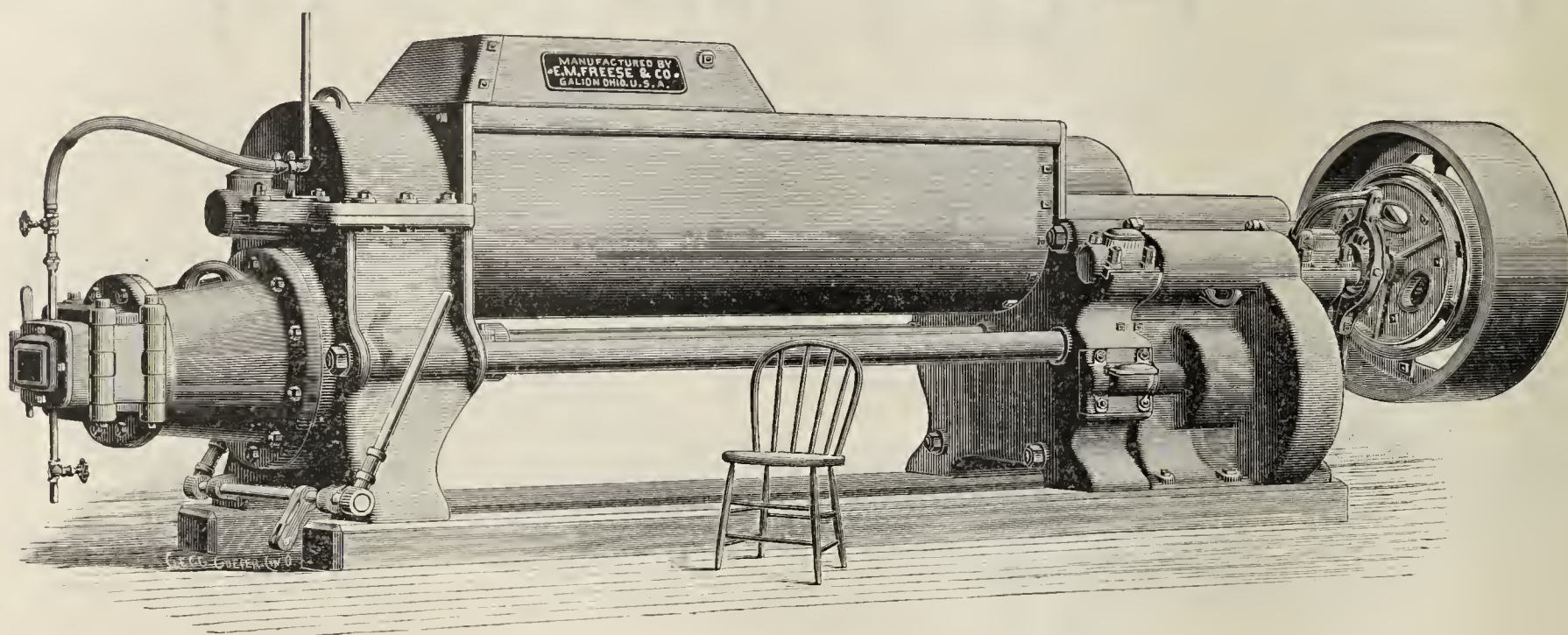
PLYMOUTH,  
Richland County, OHIO.

**B. E. LaDow,**

Special Western Representative,  
406 Chamber of Commerce Bldg., CHICAGO, ILL.

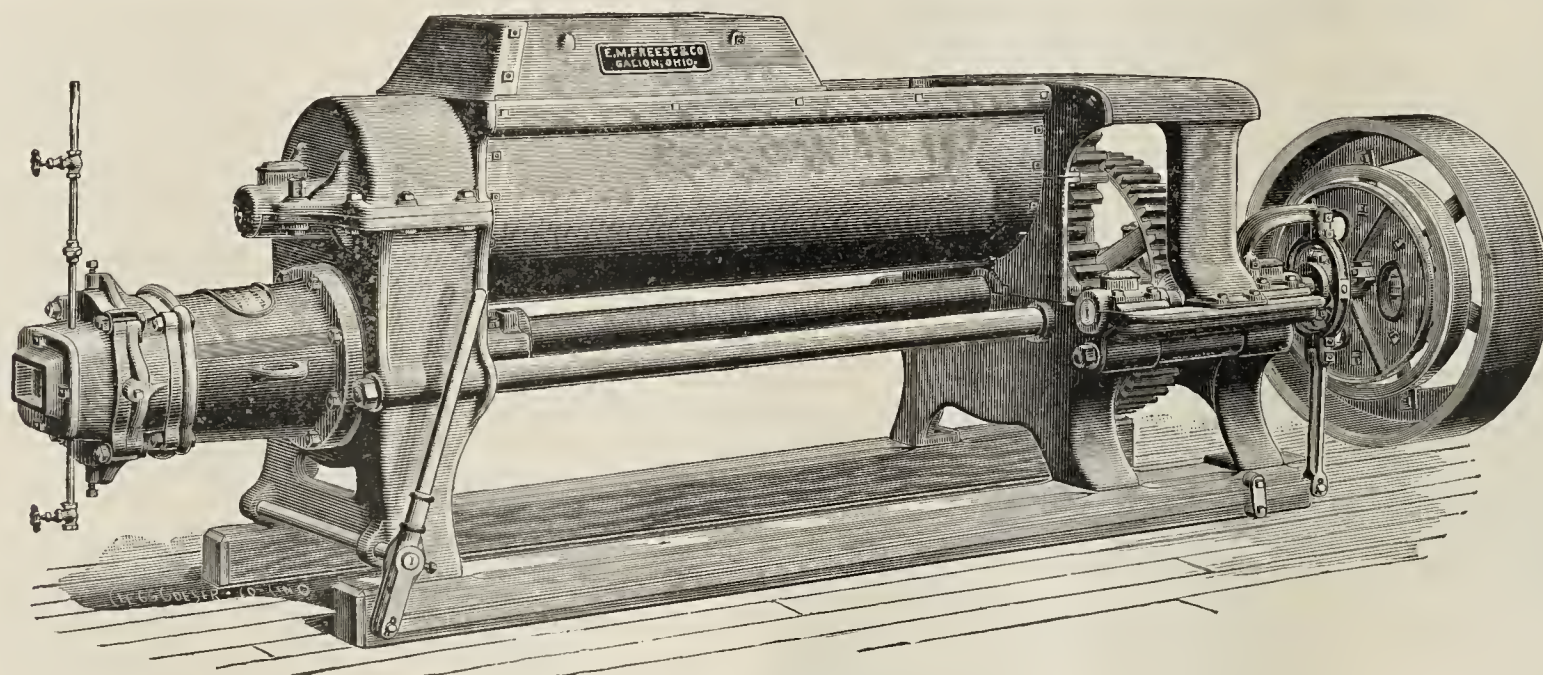


# The Original Union Brick Machines



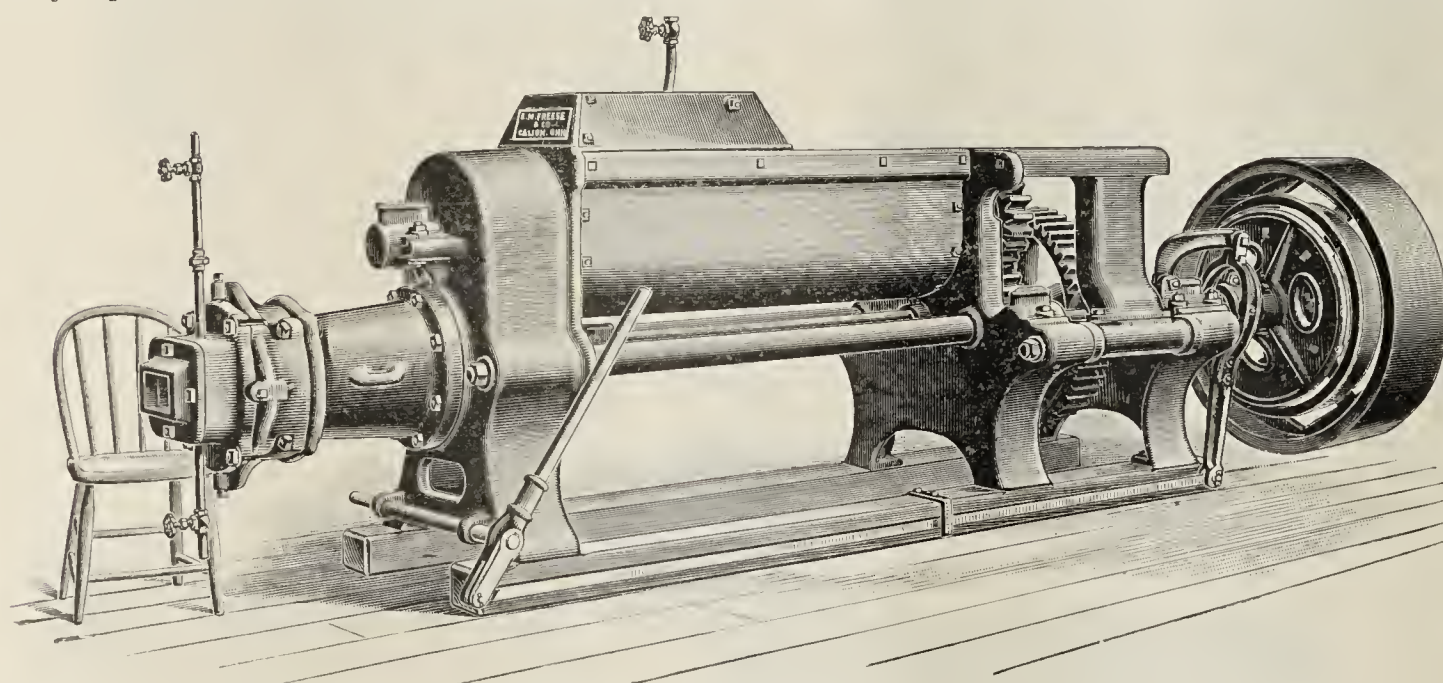
## SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



## No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



## No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

**E. M. FREESE & CO., Galion, Ohio.**

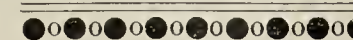


These Machines are  
NOT an experiment.

They are used in fif-  
teen States.

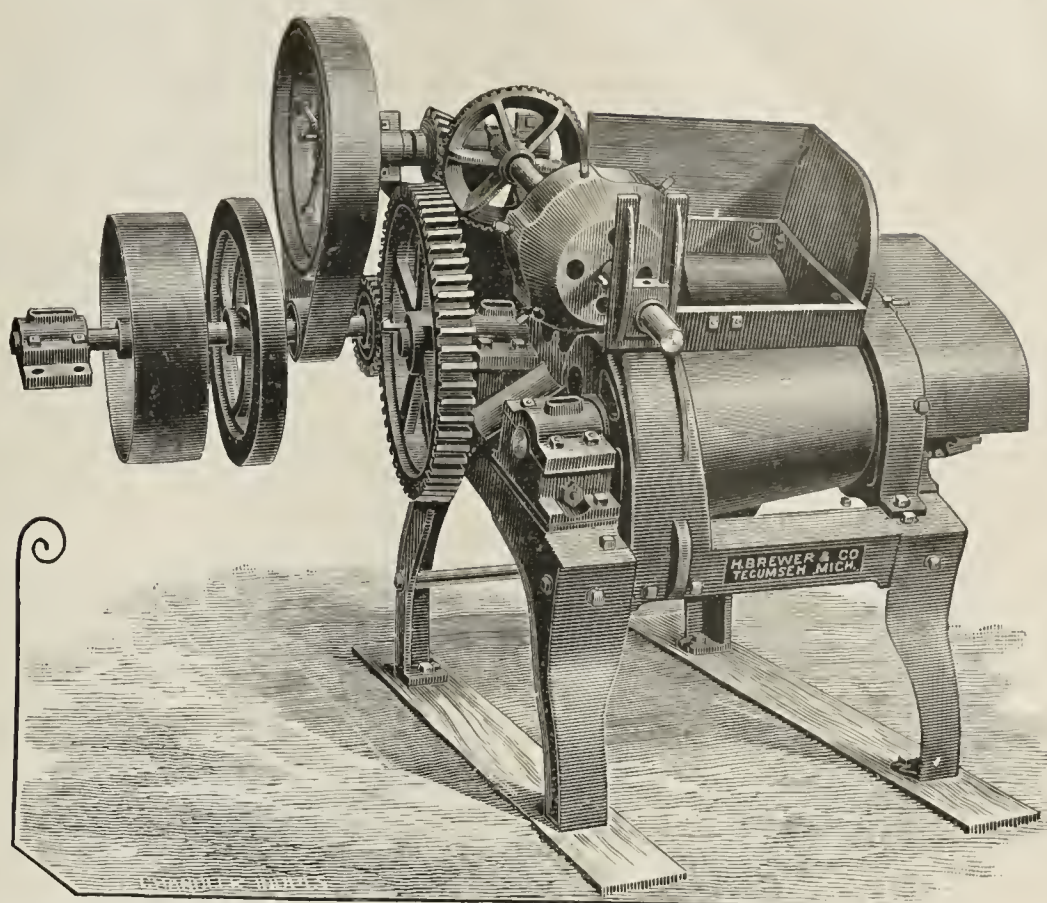
They are a SUCCESS  
Investigate them.

No separate Pug Mill  
required.

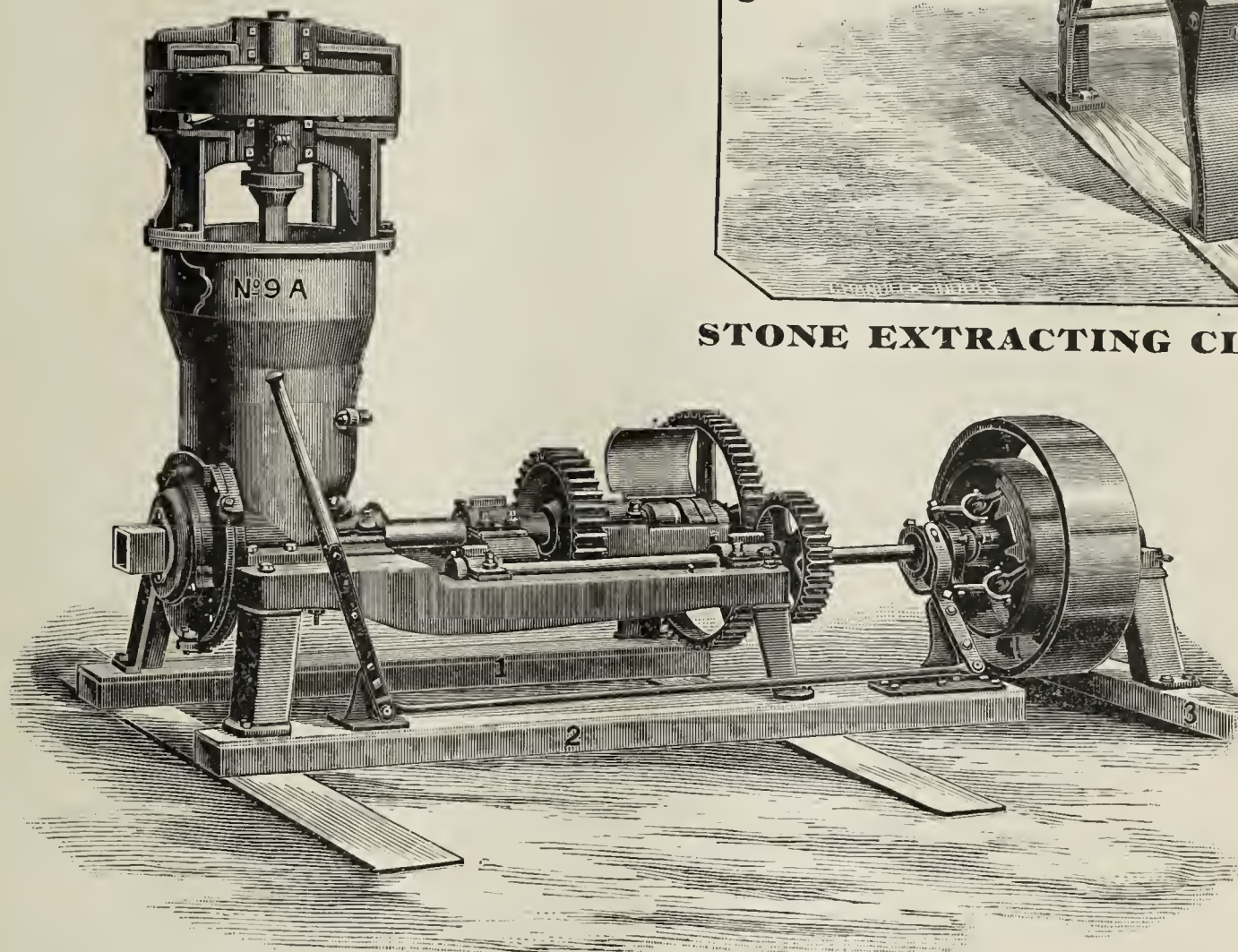




# Clay . . . . Working Machinery

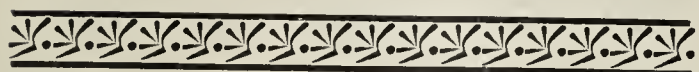


STONE EXTRACTING CLAY CRUSHER.



No. 9 "A" BRICK MACHINE.

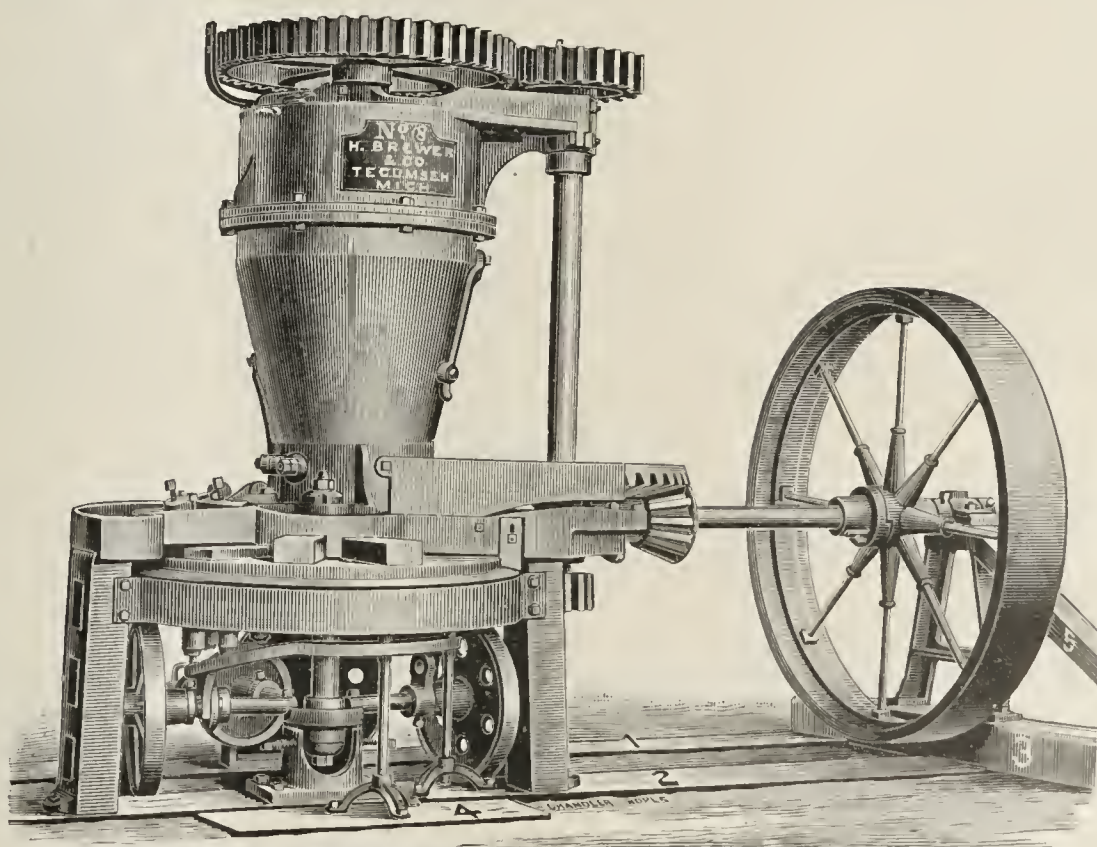
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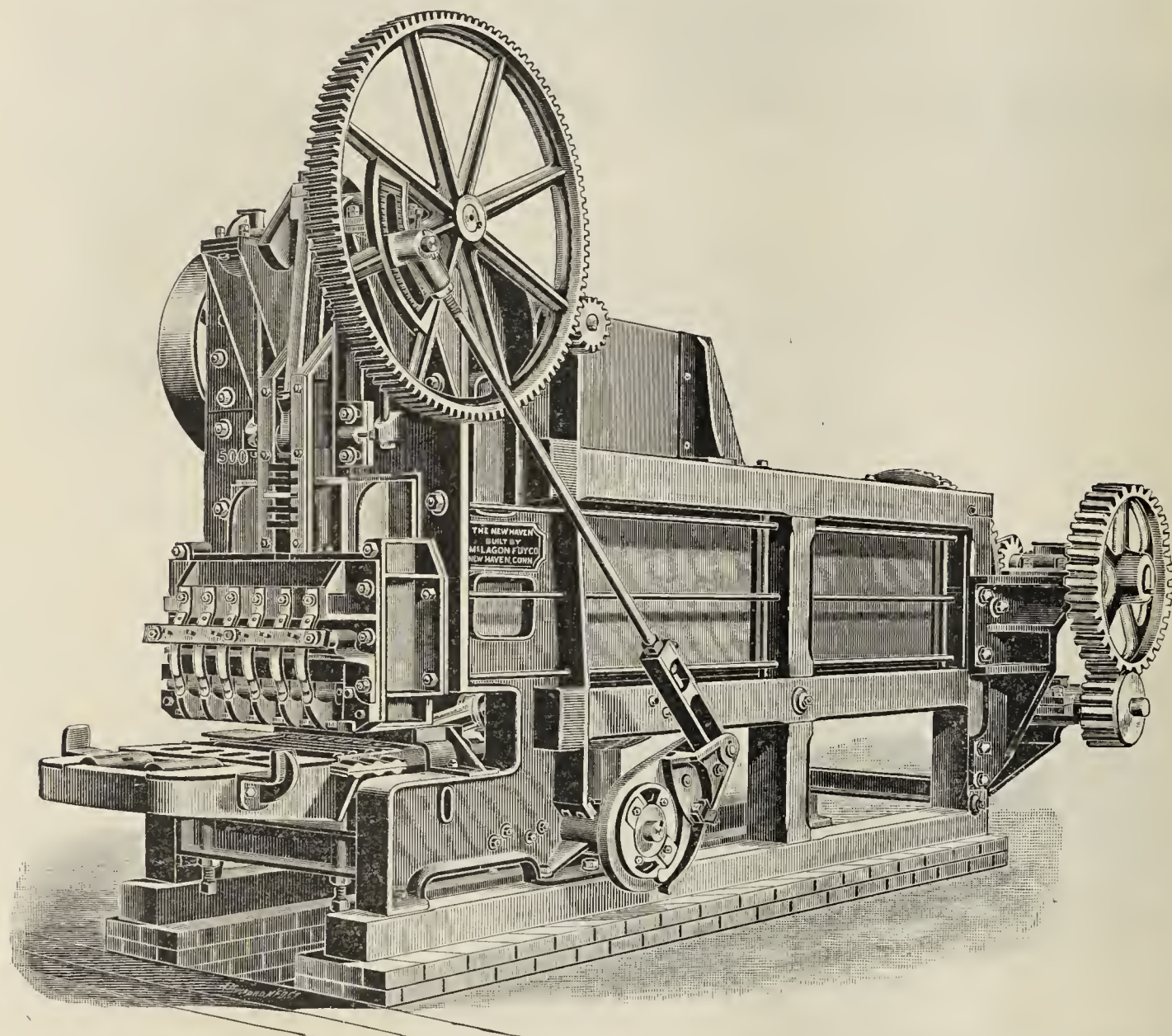
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Very  
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Gentlemen:—We are now making brick with your "New Haven" Machine for the fifth season, and are perfectly satisfied with it in every way. We have had little repairs to make at any time, and it **has not cost us anything for repairs or new parts in the last 18 months.** We can not speak too highly of it and shall be pleased to have you refer to us at any time as to its merits. We think it is the best and strongest soft mud machine made.

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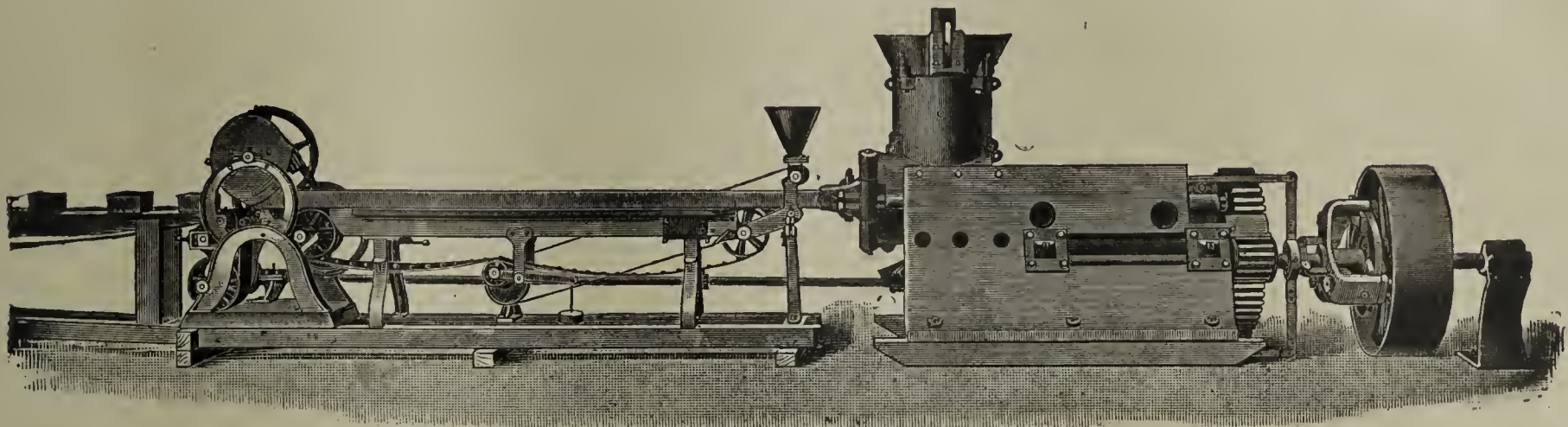
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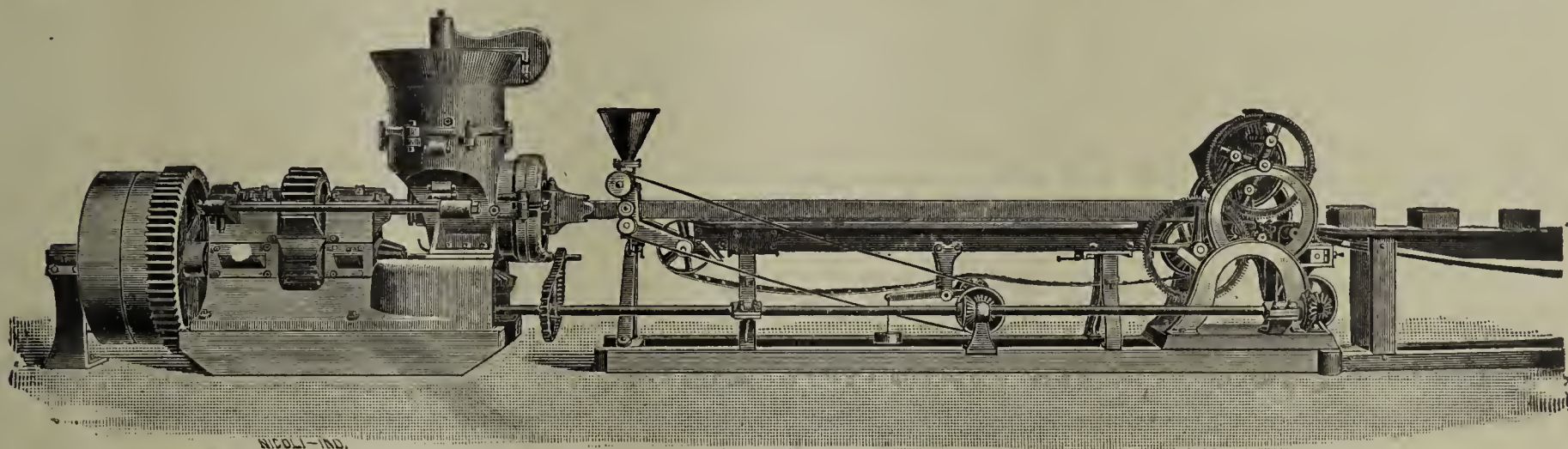
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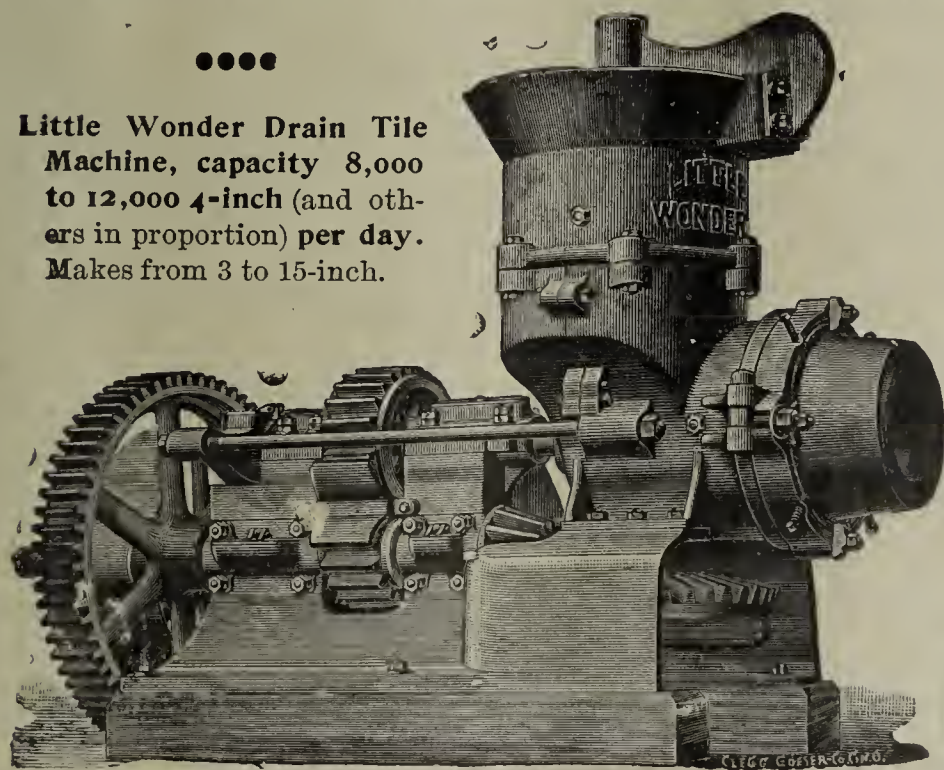


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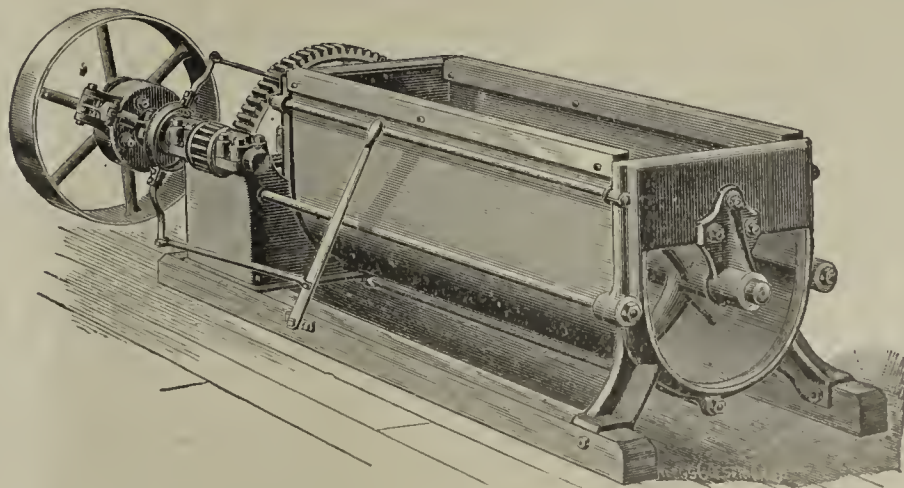
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VOL. XXIX, No. 6.

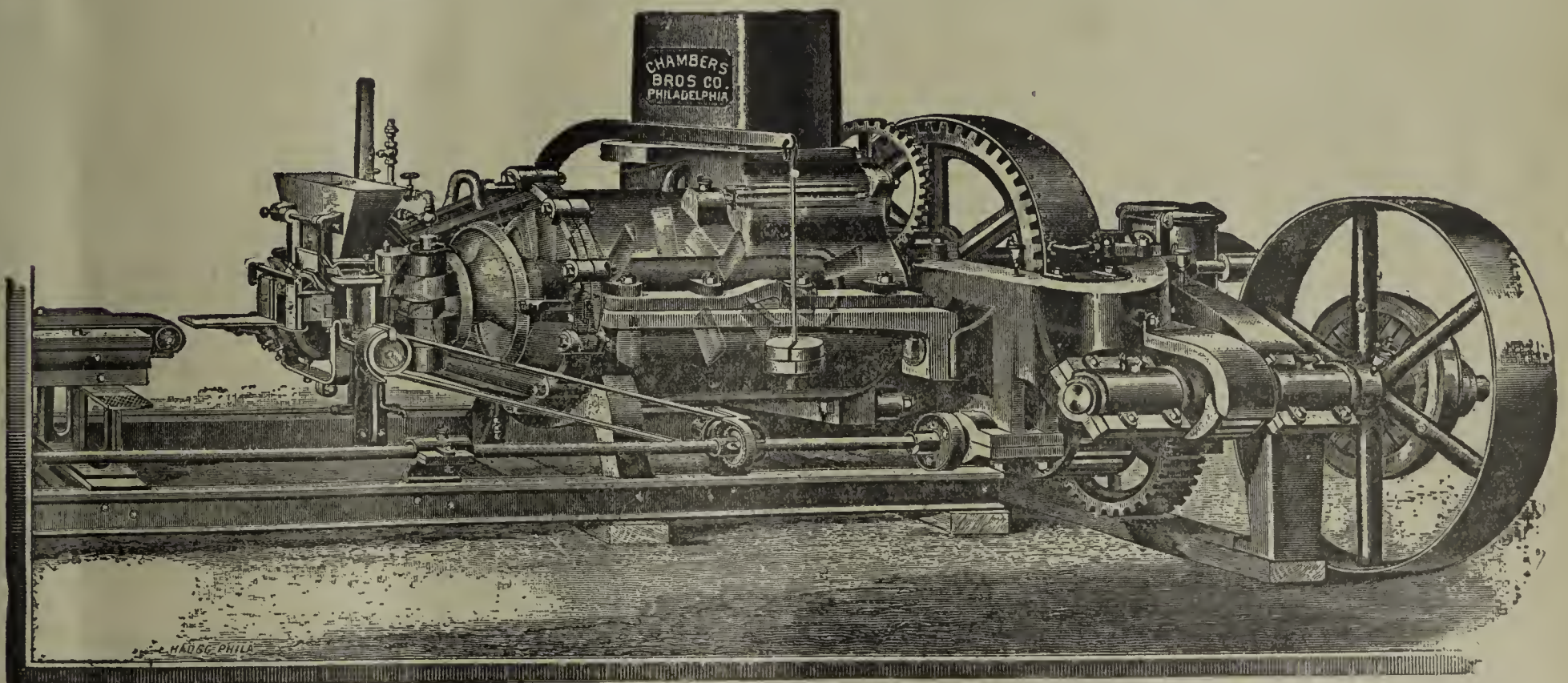
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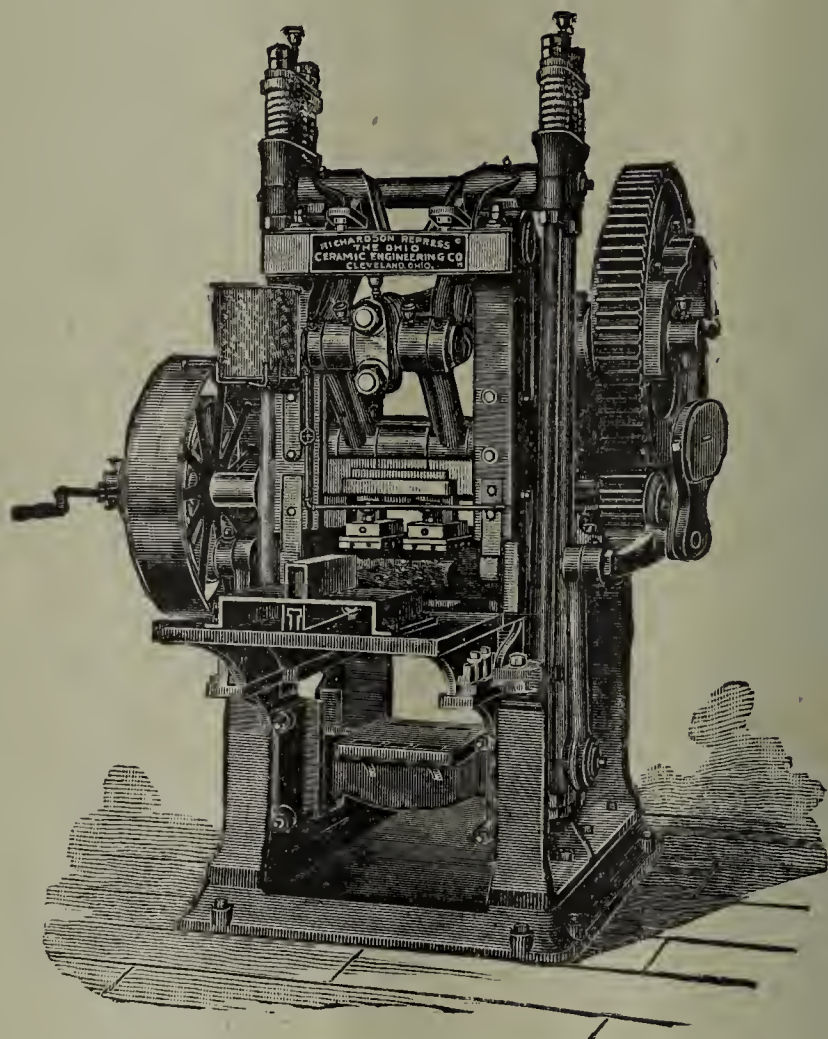
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Simple in Construction, Strong and Durable. Never breaks or Causes Delays.

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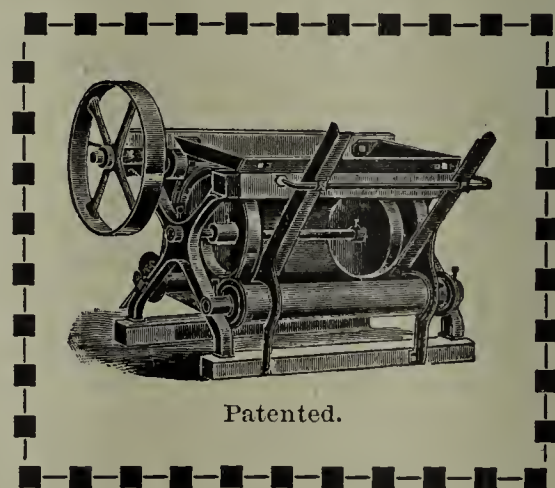
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Dear Sirs—We have used four of your Mould Sanding Machines the past season, and they have given us entire satisfaction, neither one of the four having lost any time from breakdowns, or delays of any kind.

Yours respectfully,  
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This is a great money maker. A boy does the work better than can be done by hand; no sand wasted; is easily adjusted to suit any size mould.

We also make a specialty of Brick Moulds for machine or hand, made of all cherry, bound with extra heavy steel. You will find our prices right.

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PERFORATED SHEET STEEL  
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# The MONARCH

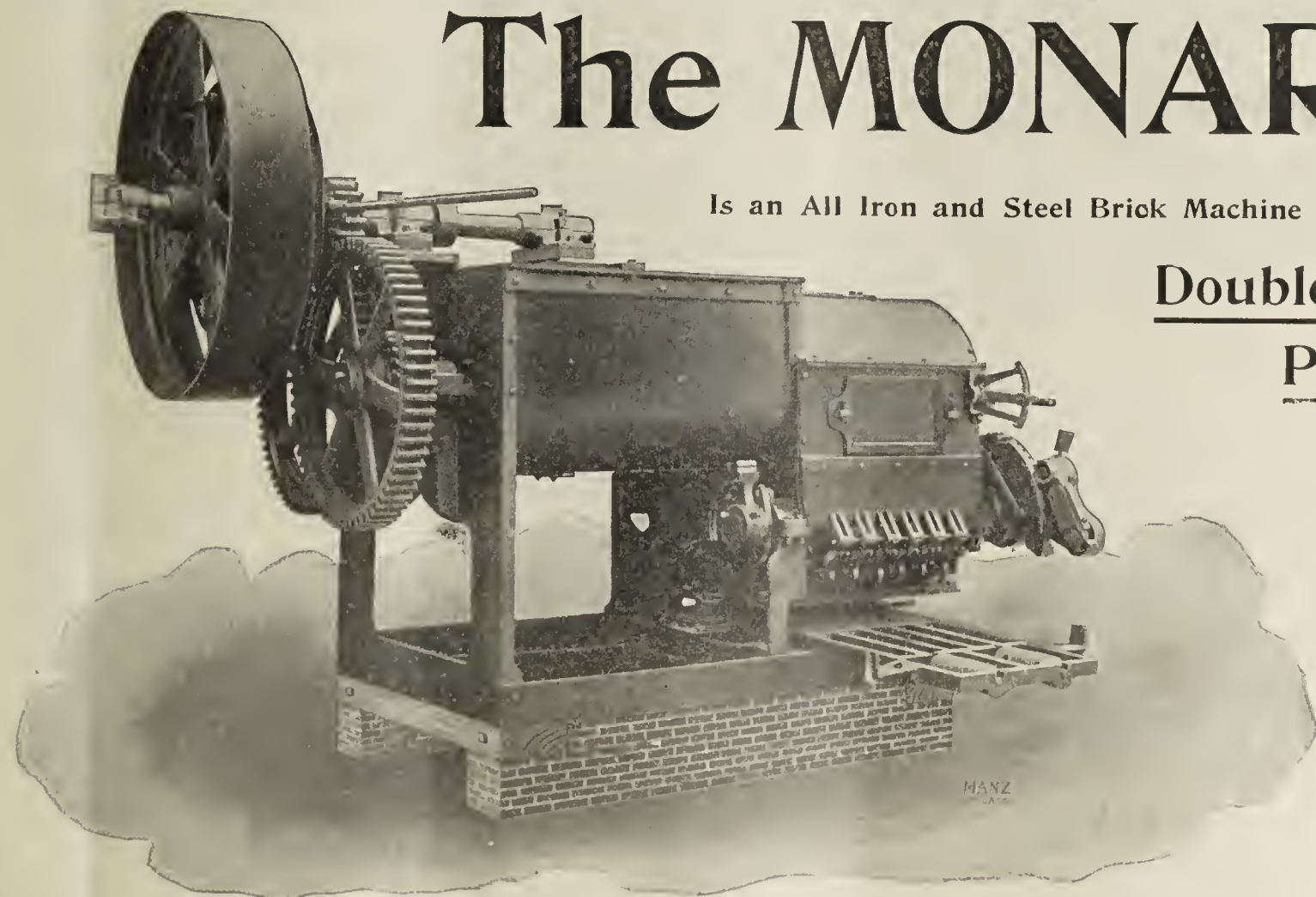
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SIMPLE  
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Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER**. Engines and boilers. Send for 1898 Catalogue.

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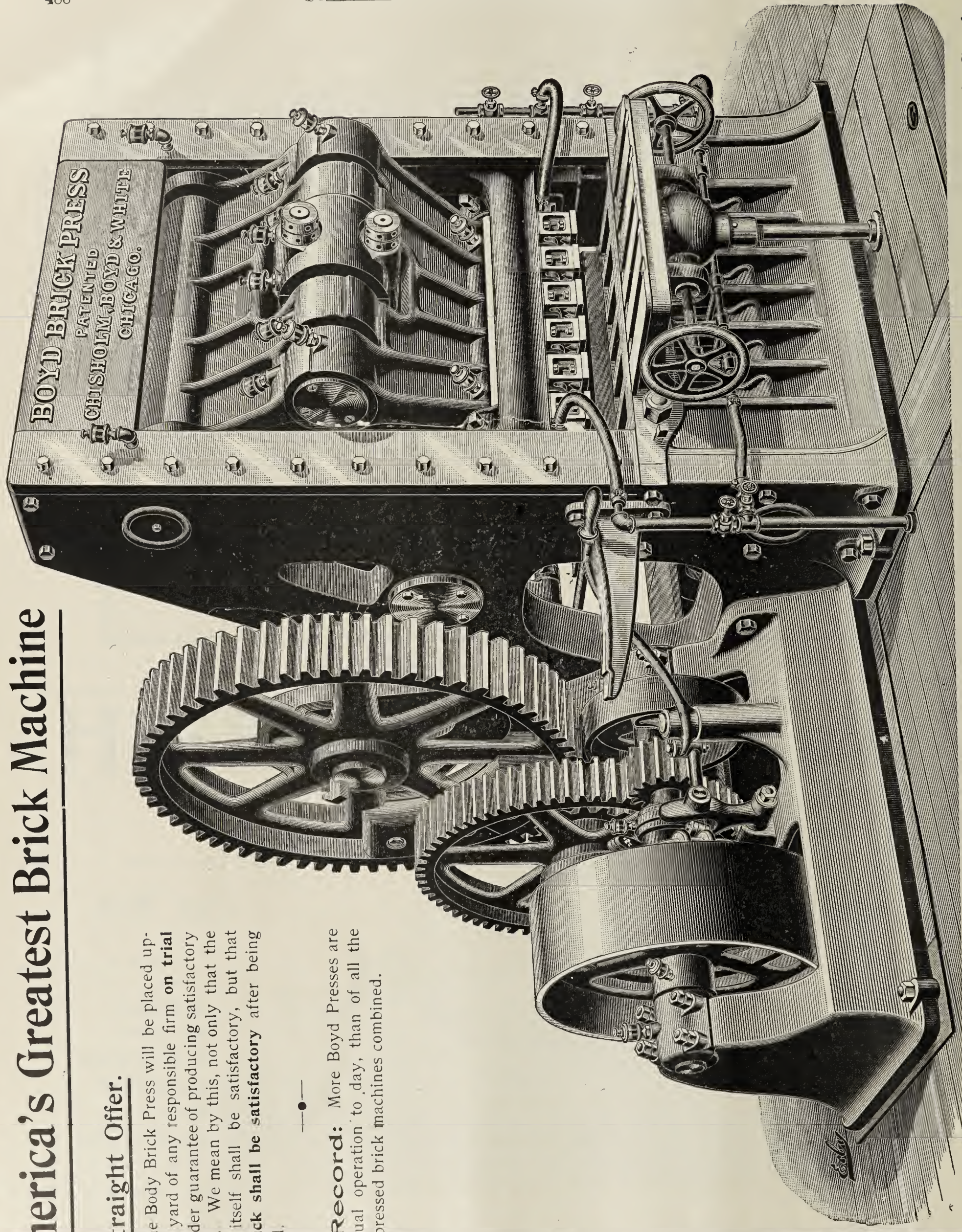


# America's Greatest Brick Machine

## A Straight Offer.

The Body Brick Press will be placed up-  
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and under guarantee of producing satisfactory  
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Press itself shall be satisfactory, but that  
the **brick shall be satisfactory** after being  
burned.

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**Its Record:** More Boyd Presses are  
in actual operation to day, than of all the  
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THE inexorable law of the "Survival of the Fittest" is well illustrated in the continued success of the **SIMPSON BRICK PRESS**. It was one of the first successful dry presses manufactured in America and from its introduction has held a leading place. The improved **SIMPSON PRESS** is a thoroughly up-to-date machine and embodies many excellent features, that make it invaluable to the brickmaker who wishes to make the best quality of Press Brick—at moderate cost.

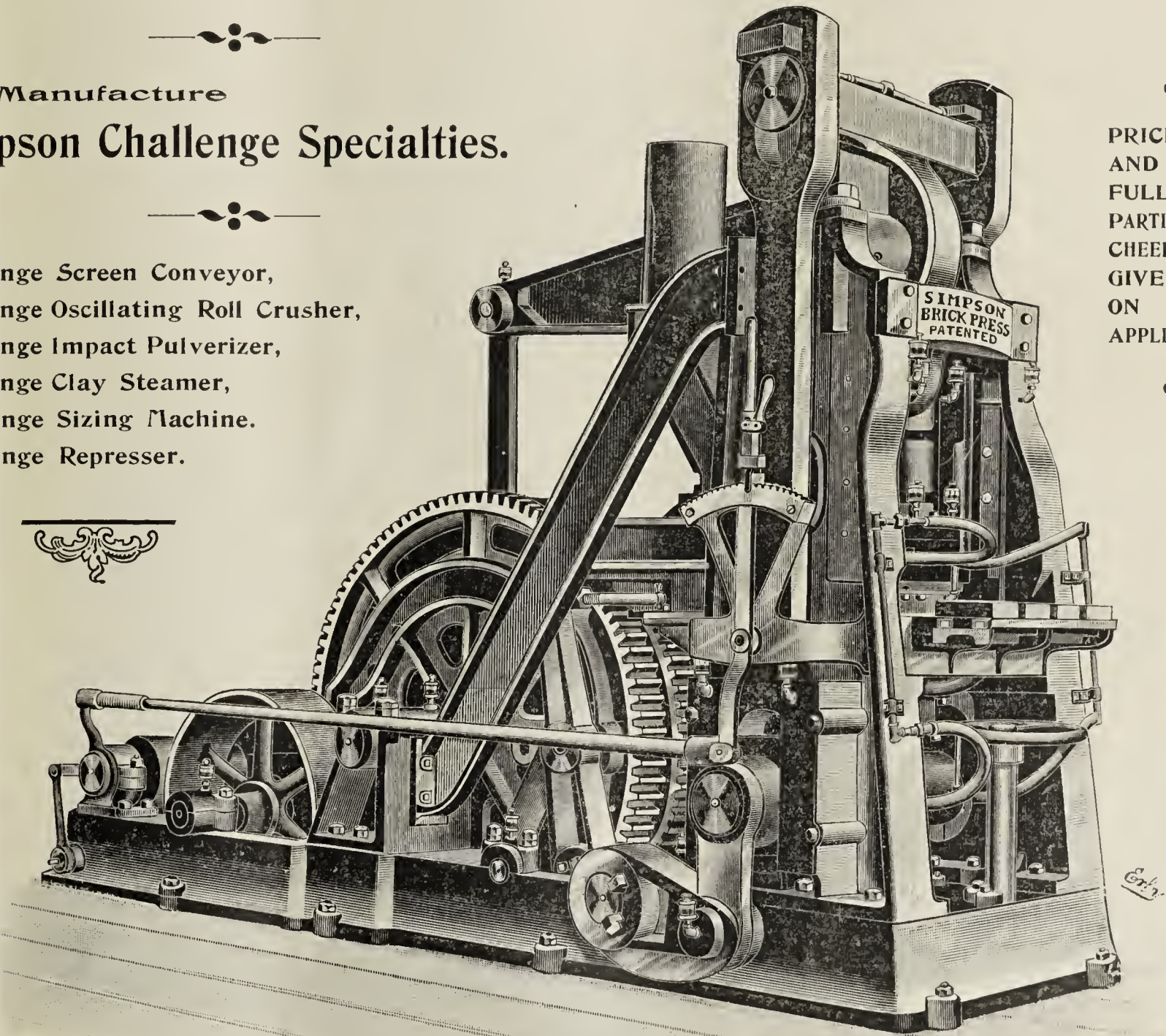
We make a specialty of complete equipments including every device required on a modern press brick plant. Don't fail to get a list of our new improved Challenge Clay Preparing Machinery.

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Simpson's 4-Mold Brick Press, Model AA, New Style. BUILT IN 4 SIZES.

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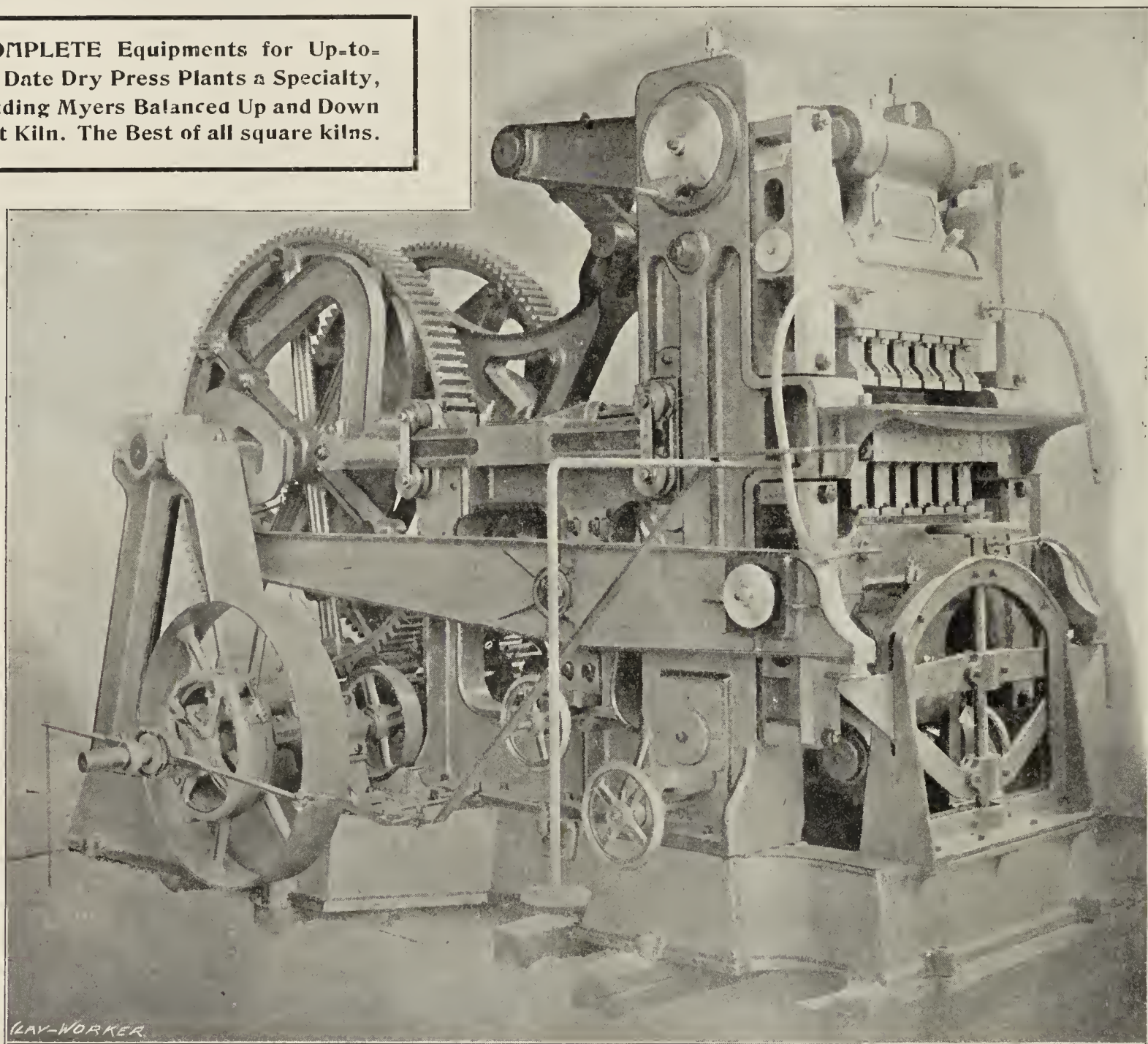
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# The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

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The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

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1214 and 1216 Poplar Street,

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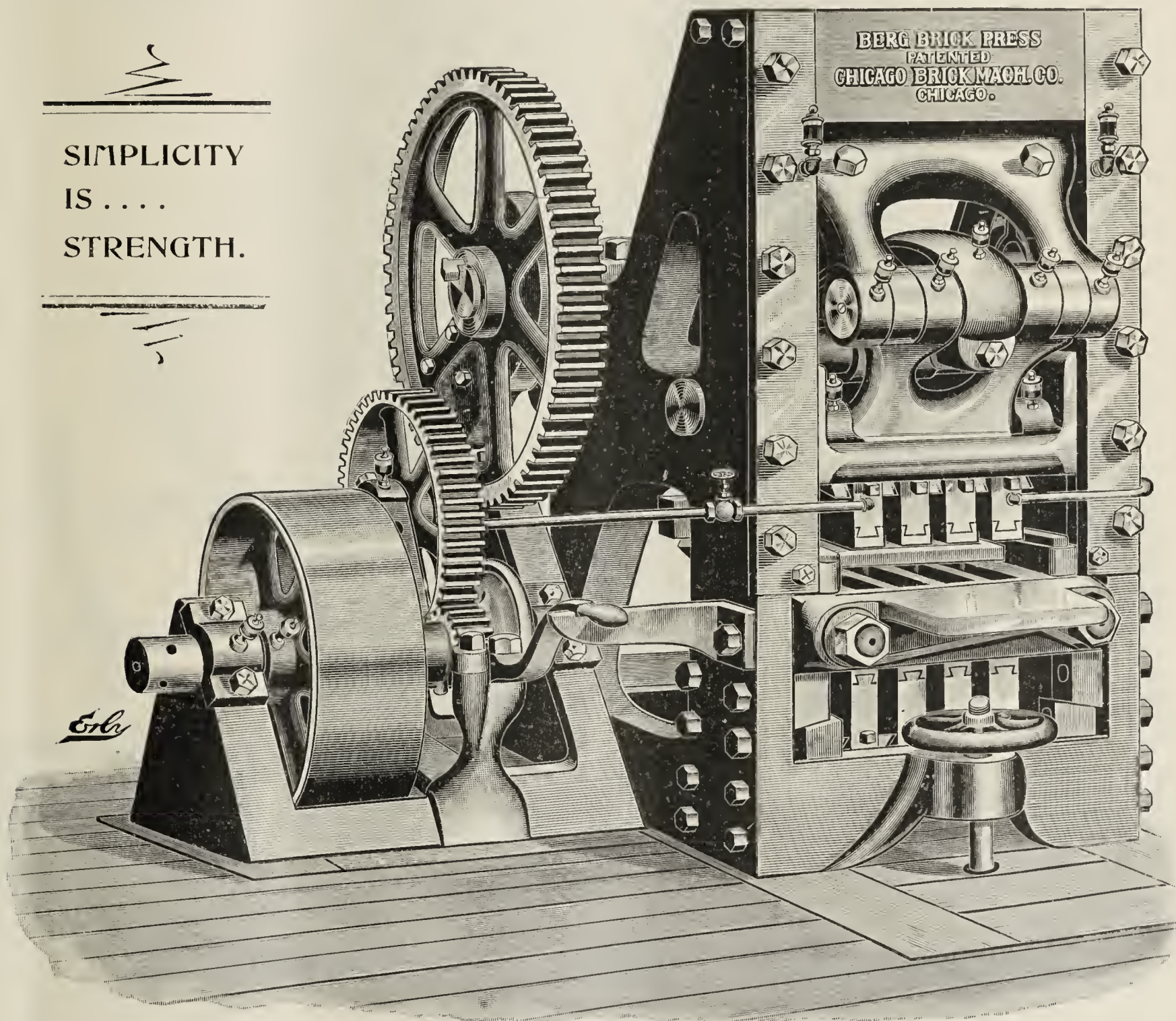


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Is Pronounced by the U. S. Government—the Highest Development of the Art of Making Brick. . . .

ENTIRELY ORIGINAL IN MOVEMENT.

SIMPLICITY  
IS . . . .  
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Absolutely Unbreakable.

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No Experiment, has been running successfully more than a year. Simplest and Strongest of all Dry Presses. Many new features. Send for Circular.

Our Stiff Clay Machinery is just as good in its line as our Dry Press. Most modern in Design and Construction. Makes highest grade of Paving and Building Brick and Drain Tile. Also the latest and highest development of Soft Clay Machinery, combined Disintegrator, Pug Mill and Brick Machine. Only successful down delivery mill for making large tile.

In fact, anything you want—and all Up-to-Date.

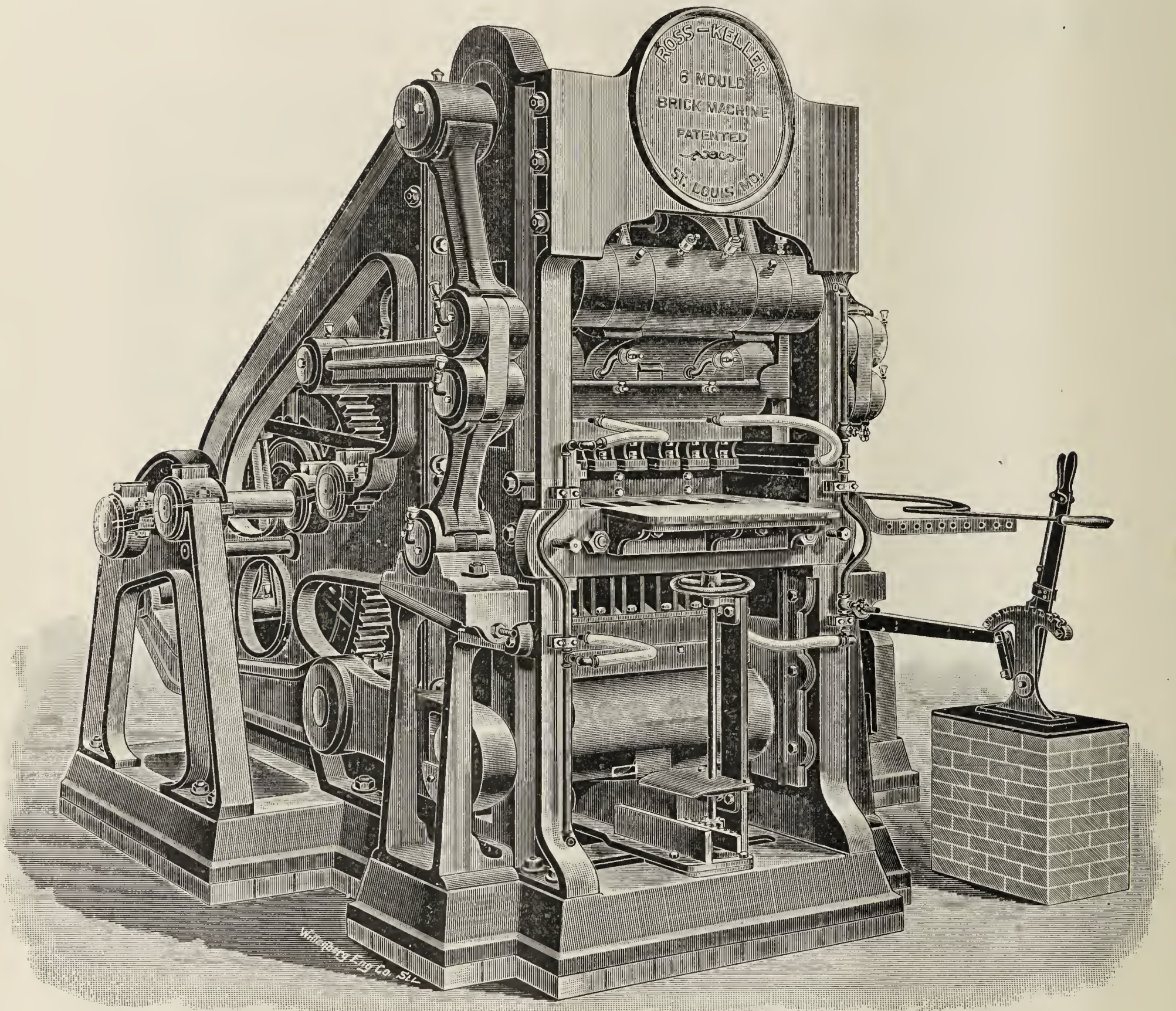
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Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

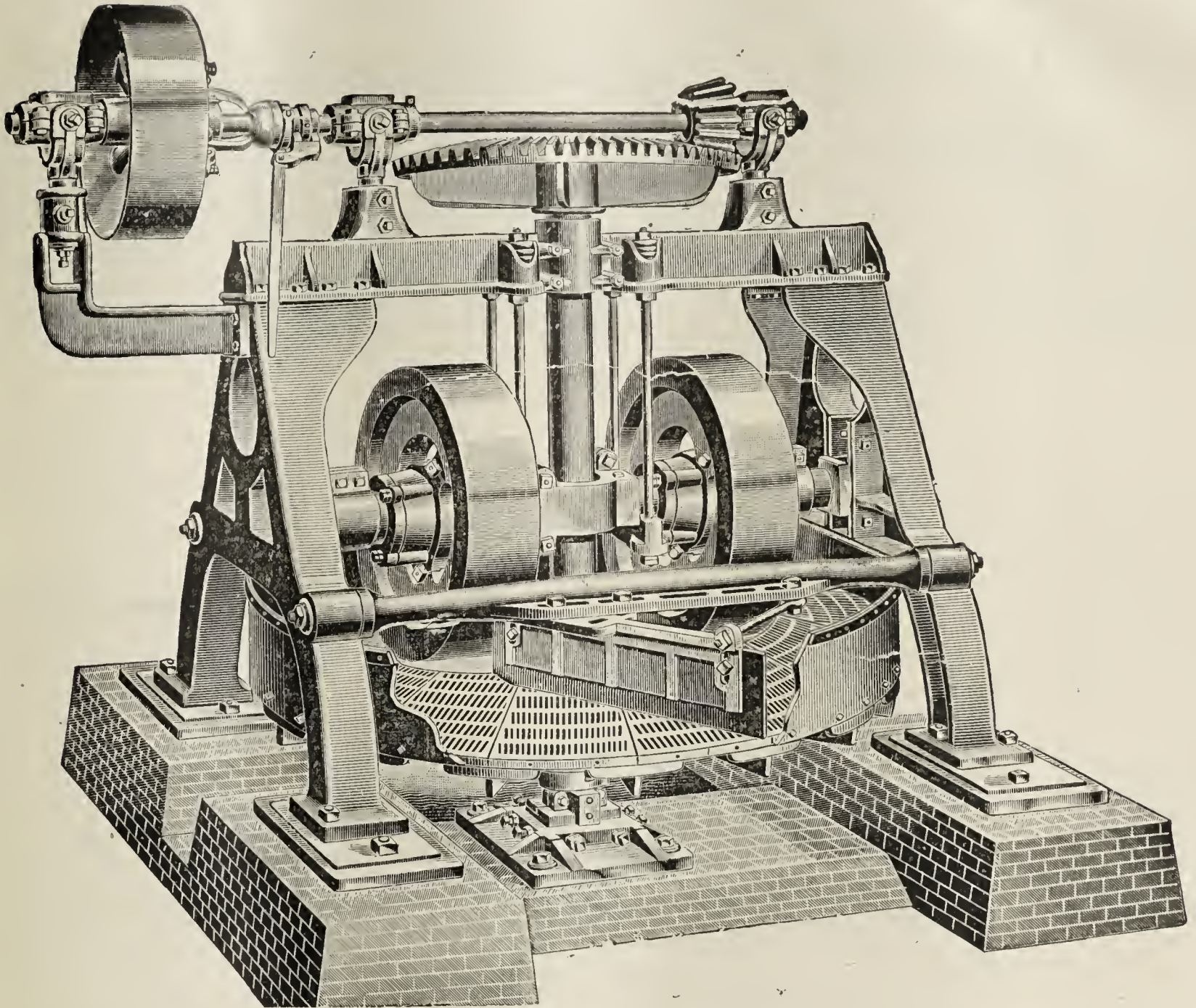
If you want the best come and see us, or write for price and full particulars, address

**Ross-Keller Brick Machine Company,**

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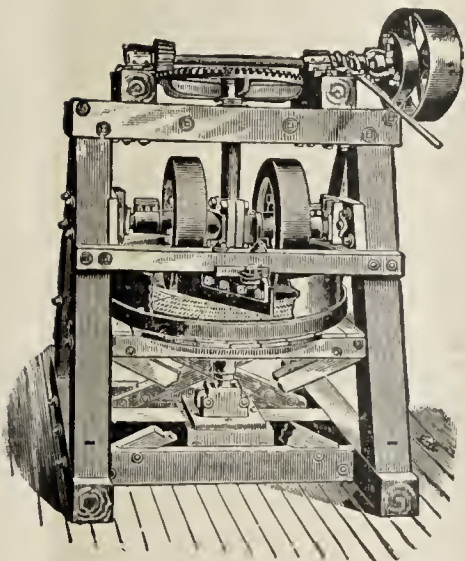
**ST. LOUIS, MO., U. S. A.**





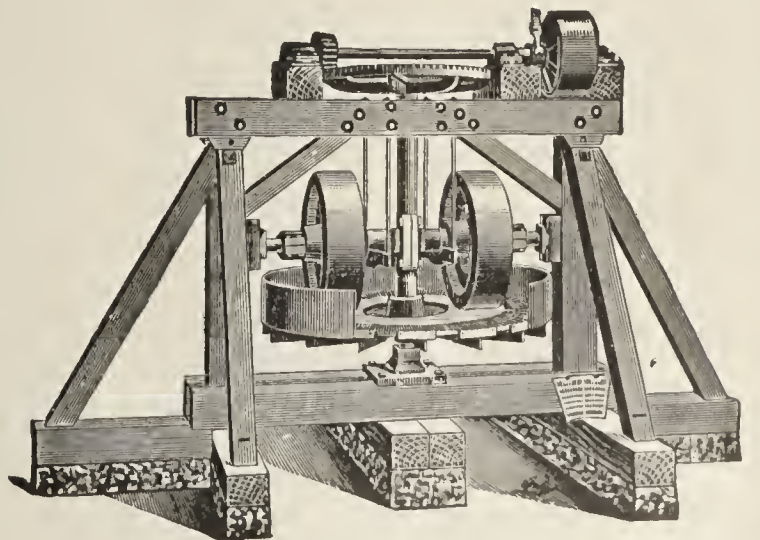
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## The Turning Point....

Between success and failure in the brick-making business is many times in the Drier. No matter how good your clay may be, no matter how thorough your equipment may be, no matter how efficient your force may be, if your Drier isn't right, failure, in a greater or less degree will attend your efforts.

This is a logical conclusion, based on the following facts: If your Drier doesn't do its work quickly; dry your brick uniformly in a given time; prevent checking and cracking, and do it all with an economical use of steam, it will lose you money every day you operate it, and **that** means failure.

This much agreed to, the question arises, "which is the best Drier to buy," and "why?" We unhesitatingly say that



## The STANDARD IMPROVED

## BRICK AND TILE DRIER

Comes nearer being a **perfect** Drier than any other in the World. Of course we would naturally be expected to say that, because we are "interested," but why shouldn't we say it--when we have many letters from brick and tile makers in all sections of the country, which prove it?

See this is what one company thinks of **The Standard**:

THE STANDARD DRY KILN Co., Indianapolis, Ind.

In answer to your favor regarding the "Standard Drier" erected at my brick works at Maple Shade, N. J., would say;

Before putting in your Drier I was much troubled with whitewash in my brick, but this has all disappeared. I have burnt over two million brick since you put in the Drier, and have no whitewash whatever. We dry our brick very dry (25,000 every day) and presume it is carried off in the watersmoke from the Drier, as there is a vast decrease of gas from the kiln now when burning.

Your method of returning the condensed steam from the Drier back to the boiler with your Trap is perfect, working automatically, and raising the water about fifteen feet to throw it into the boiler. It requires no attention whatever.

I am glad I followed your advice and took the double deck cars, as the brick dry better, and there being less weight on each one the shrinkage can take place more naturally. The cars are entirely satisfactory, and move easy.

The Drier simplifies our business very much. I would not be without it, and consider it the **best Drier I have seen during an experience of thirty years.**

Yours respectfully,

AUGUSTUS REEVE.

Camden, N. J., Sept. 25, 1897.

Now, as this letter is but a single expression, taken from hundreds of a similar nature, does it not convince you that if you **want a Drier**, you should investigate this one?

We don't care what kind of clay you have, we will guarantee to try your product economically and satisfactorily.

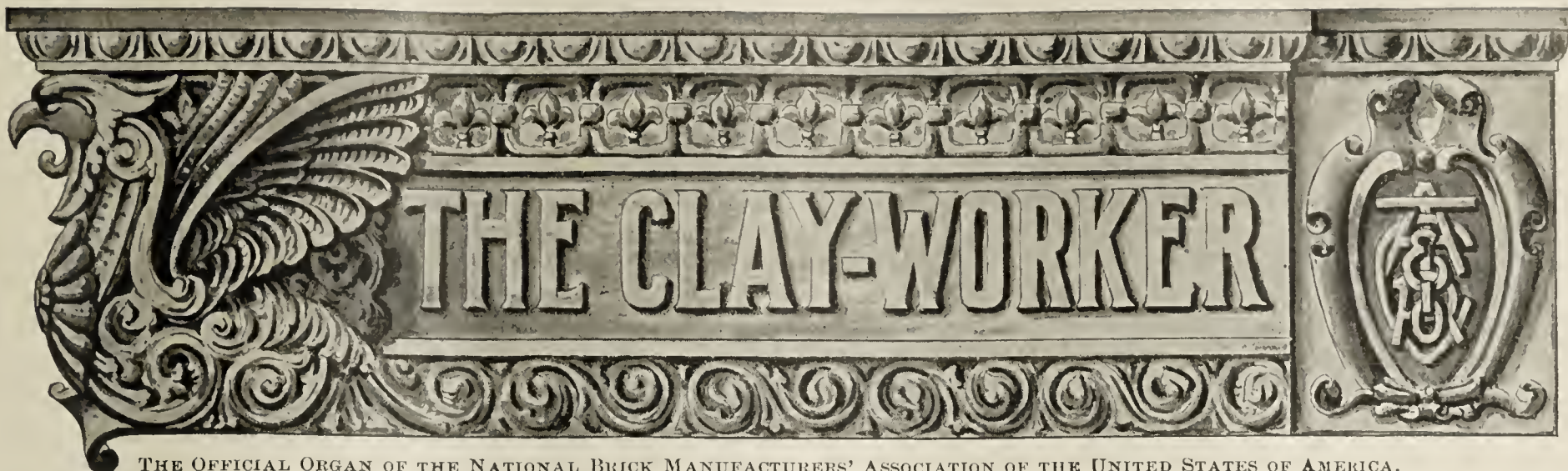
Write for catalogue, testimonials and full particulars.

# The Standard Dry Kiln Co.,

186 South Meridian Street.

INDIANAPOLIS, IND.





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXIX.

INDIANAPOLIS, IND., JUNE, 1898.

No. 6.

## TERRA COTTA IN ARCHITECTURE.

BY JOSEPH JOINER.

CONTINUED FROM MAY CLAY-WORKER.

IN SPEAKING of the treatment of terra cotta in architecture, I would commence by using the remark of one who has said "One of the most essential functions of architecture is expression, and all architecture should be, as far as possible, expressive of two things—its purpose and its construction. The question of purpose affects the general design of a building; the question of construction affects the special uses of the several materials composing it," and terra cotta really demands a special treatment at the hands of architects in order to produce the most satisfactory results. The uses to which terra cotta can, with more or less propriety, be applied are so many and so various that it is somewhat difficult to define where its application should commence and where it should cease. The plasticity of the material, whilst it gives great liberty and freedom to the designer and modeler, and as to artistic execution is capable of almost endless variety of treatment, yet from the nature of the manufacture it would, looking at it from the most successful

and economical point of view, demand a limit as to the size of the individual blocks themselves. Terra cotta should not be made in too large pieces, as the larger the piece the more difficult it is to handle in the manufacture, and the greater the risk in the burning, and although I have seen some extraordinarily large columns and other work made by the Northwestern Terra Cotta Company and other companies, and which, as special pieces to suit a special purpose, were very good, they must have

cost much labor and trouble and time in producing. I would not advocate pieces that would cube up more than six feet or seven feet, unless it was absolutely imperative for the sake of construction, and as much under this as possible, and the more readily and more easily a terra cotta block can be handled in the manufacture, the better the result, and I think the architect would be much helped in making his design and application of terra cotta work generally by paying an occasional visit to terra cotta factories and becoming acquainted in some measure with the manufacture, if only on the score of the old adage that "Ignorance is expensive, but knowledge is power." The most pleasing effects from the use of terra cotta will most surely come from those buildings that have been especially designed for terra cotta, because much can be done by the architect



ENTRANCE TO INDIANAPOLIS PUBLIC SCHOOL No. 45. The Ornamental Trimmings Furnished by the Indianapolis Terra Cotta Co.



in studying his design to counteract and allow for any little irregularity of shape and outline contiguous to the material, for whilst it would be very difficult to design anything in terra cotta that could not be built in stone, yet a building could be designed for stone which could not be reproduced in terra cotta in the same way, and right here is where the co-operation of the manufacturer would be of much assistance to the architect. The matter of design and the manner of treating terra cotta are subjects for much thought, and require not only artistic ideas, but the exercise of good judgment, for if terra cotta is made to imitate stone, it immediately becomes a counterfeit; it is a deception, hence it is an error, and one of the greatest pleasures which arise from the use of terra cotta in architecture is the satisfaction engendered by the simple merit of the material.

—Relation to Brick and Stone.—

In speaking of terra cotta in combination with brick and stone, or in comparison with either one or the other, I would say that terra cotta has in itself more the nature of brick than stone. It can be used very successfully in combination with either one or the other, or both, according to the scope of the design, but its effect is often marred by the attempt to make it an imitation. Mr. Wagner, of the Northwestern Terra Cotta Company, says: "The great difference between terra cotta and stone is that stone is ready for its designation after receiving the finishing touch by the carver or mason, whereas terra cotta, when it leaves the hands of the modeler or presser, has yet to be dried and burnt, and this is a slow process, and one that is not always crowned with success, as a piece of terra cotta will sometimes warp and twist and crack and be off color. When stone is in the building it can be adjusted and worked up and the face wrought upon with a chisel, because the body of stone is homogeneous throughout, so that the same identical surface may be produced ad libitum, whereas terra cotta has but one surface, which, once destroyed, can never be restored. Ends and unexposed parts may be trimmed like stone, but the face cannot be touched after burning." In the matter of smaller pieces, in comparison with stone, and the necessary frequency of joints in terra cotta work, and which may be a point of objection with some architects, I would say this is remedied and overcome by making a lap or cover joint on all washes, and it must be conceded that the class of modeling and ornamentation that is now being produced in terra cotta is far ahead of the general character of all stone carving, for terra cotta modelers are not mere mechanics, but artists, and appreciate the value of beautiful figures and graceful lines. And as to the surface finish of terra cotta, whilst terra cotta should have its own particular finish, yet, if so desired, any kind of masonic finish can be placed upon the surface of it. Mr. Sullivan, of Chicago, the eminent architect, says: "The artistic possibilities of this fine material are limitless." There are several other important characteristics relating to terra cotta, and which make it stand pre-eminently to the front as building material, viz., color, strength, durability, fire-proof quality, adaptability for steel and iron construction, and economy.

—Color.—

In speaking of color, there is always a peculiar brightness in the general appearance of all terra cotta, which I think is due somewhat to the metallic condition of the ware after having been subjected to the high temperature of heat in burning, that lends a more cheerful aspect to buildings than any other building material known. Some twenty years ago two or three colors seemed to predominate, principally buff and red, but in the eighties an agitation of colors commenced, and demands for various colors were constantly being made, which demands were met as soon as they could be permanently and practically responded to by the manufacturers, until to-day enough colors can be produced to satisfy the most fastidious taste. I think a mistake is made where the terra cotta is required exactly to match the stone or brick in color. If the terra cotta part of the design has a special "motif" or expression, which it should

have, that part of the design should most certainly be expressed in a slightly different shade of color to the brick or the stone—not too much to make it conspicuous, but enough to bring out the expression of the design readily, and here it would be well to add that architects must not expect perfection in the uniformity of color in every block of terra cotta, any more than the same expectation can be fully realized in the use of stone. Much has been said of late upon the subject of "white" or "cream" as a color, and many buildings have been erected with terra cotta of these shades of color, but it has yet to be proved whether these very light colors are the most serviceable to adopt in the atmosphere of our large cities.

—Strength.—

As to strength, whilst terra cotta in itself has immense strength, both by way of support and resistance, yet it is never advocated that it should be placed into buildings in the same hollow condition that it comes from the factory,—but, on the other hand, every block should be filled up solid with concrete or brickwork. The first crushing tests of terra cotta, as far as I can gain any information, were made in the city of London by David Kirkaldy on June 17, 1868, at the instance of Charles Barry, the architect, who had been using \$140,000 worth of terra cotta in one building, Dulwich College, mentioned before, and amongst the many tests that were made I would present this one to your notice: A six-inch cube of Bath stone crushed at 88 tons per square foot; a six-inch cube of Portland stone crushed at 283 tons per square foot; a six-inch cube of solid terra cotta crushed at 442 tons per square foot. And which at once declared, at that time, the superiority of terra cotta over stone in this respect. Mr. James Taylor, in an article in the *Clay-Worker*, reports some crushing tests made in May, 1885, by the Boston Terra Cotta Company, which were eminently satisfactory, and which, in fact, showed a better result than the tests on the English-made terra cotta of previous years. Mr. Meyenberg, in the same paper, also bears testimony to the crushing strength of this material. Mr. Wagner, in the same paper, says: "The tensile strength of terra cotta is about 1,000 pounds per square inch; compressive strength about 10,000, and if the voids and the solid portions of a hollow piece of terra cotta were as one to one, it would compare favorably with good stone." Thus it will be seen that terra cotta is fully competent to sustain its proper proportion of weight in a building. The weight of hollow terra cotta, with braces or reinforcements at intervals, made in the ordinary way, is about 70 pounds to the cubic foot, but when filled in solid it would weigh about as much as brickwork.

—Durability.—

In reference to durability, no one is content to build for his own time alone, and thus one is always reaching forward for an enduring, indestructible material. The *American Architect* of 1884 says: "Properly made and thoroughly burned terra cotta will pass through centuries, and may be the last to yield to those influences to which all natural productions must give way, the material being not only fire-proof, but also practically time-proof and indestructible." There have doubtless been some failures in this respect in the early manufacture of this material, yet they have been comparatively few, and this tends to prove nothing beyond an exception, in the face of the overwhelming proofs everywhere of the hardness and durability of the terra cotta of the past decade, and the fact that manufacturers are able to coat their ware with a slip of a far closer and more impervious character than the body itself gives us a surface that holds its color and cleanliness for a much longer duration than heretofore, and bears a resistance to the edge of any sharp tool or instrument. The advantage that terra cotta has in this respect needs no special proof in this paper, for they are all around us, and if we need a century proof in all ocular demonstration, we must surely wait a little longer. We know that timber will rot, stone will disintegrate, iron will oxidize, and all other materials will more or less yield to the destroying



influences of the elements; but hard-burned terra cotta will stand in defiance of all weather.

—Fire-Proof Quality.—

Terra cotta is claimed to be fire-proof, and from what I understand of the results of our many recent fires, terra cotta did all that was claimed for it in this respect, and this is a very important matter, for in these days of tall buildings, under the present method of steel construction, it is very necessary that such materials be used, and in such a way as to render these "mammoth structures" or "modern beehives" as nearly as possible fire-proof, hence the proper thing is to encase the ironwork of the front of the building with terra cotta entirely, or brick and terra cotta combined, for stone is not a good fire-resisting material, and encase the iron framing with what is called "fire-proof terra cotta," so as to prevent the heat arising from a fire affecting it, for we know that if iron is not properly protected it becomes the frailest possible material in the event of a fire, but if properly protected it becomes an important factor in all high buildings. There have been instances of failures in this respect from the want of proper fire-proof qualities and proper methods used in this encasement, but as I am not an expert in this material, I do not feel qualified to speak of it in detail, but I would refer you to a valuable address on fire-proof construction delivered last year by Mr. W. L. B. Jenney, of the firm of

much remains to be done in interior decoration by the use of enameled terra cotta of an ornamental and artistic character, together with enameled brick, and which can be produced in colors.

As to the cost of terra cotta in comparison with stone, and which is the only building material that it legitimately comes in contact with in this respect (for galvanized iron, though much used, cannot be recognized in the category of constructional building materials), I would say that in perfectly plain work it is a sharp tussle between the terra cotta and the stone, and if it is a work of no repetition, stone is liable to be somewhat cheaper, for, although the cost of terra cotta, from increased experience and improved methods on the part of the manufacturers the past few years, has been much reduced, the cost of stonework, from improved methods of cutting and planing, has been reduced also, but where there is much repetition of the same form, and where any amount of ornamentation is introduced in the moldings, then the cost of terra cotta is far below that of stone, and the effect of all such ornamentation is, from the plasticity of terra cotta as a material in its clay state, far superior to anything that can be produced in stone.

In conclusion, I would like to say a word about setting terra cotta. Much terra cotta is marred by imperfect setting done by common brickmasons, and it can be at once seen that a good



Art Panel Executed in Terra Cotta by Indianapolis Terra Cotta Co.

Jenney & Munday, architects, before the Chicago Fire Underwriters' Association, in which he says that "fire-proofing should be much more substantial than what it is at present in general use." Hollow brick walls are very good for interior linings, and much to be recommended, but they should always have an exterior backing up of solid brickwork. Terra cotta is the most economical and advantageous material that can be used in connection with steel construction, for, being hollow in its manufacture, it can be much more readily and more securely fastened and attached to the iron framework, and then bonded in from the inside with the general brickwork, and, as Mr. Wagner says, "As long as there is sufficient mass of wall to impress the beholder with an air of stability, our building conforms with esthetical requirements." Without the aid of diagrams I could not go into the matter of terra cotta construction in connection with steel construction, but in the Brick Builder, a paper with which most of you are familiar, during the past year many valuable illustrations on this point have been given. Another point of economy which arises from the use of terra cotta in connection with steel construction is that the steel construction need not be so heavy as where stone is used; hence a great saving in the cost of the steel framing.

In the year 1870, at the South Kensington Museum, London, I saw iron columns encased with a fire-proof shell and then covered with an elaborate treatment of terra cotta, both biscuit and glazed. This was in interior construction, and I think that

stonemason is the best man to set terra cotta. He can use a chisel, has been accustomed to set blocks of stone in alignment, and would be much more skilled in this connection with terra cotta than any ordinary brickmason. Hence a better job could be expected from a workman of this character. Terra cotta, when it arrives at the building, should be laid down on some floor to ascertain the jointing that will be necessary to bring all the pieces together in good form, and thus the setter will become acquainted with each individual block, and what it requires at his hands, before he puts it into the wall. If a stonemason cannot be obtained, the next best man is one who has been accustomed to lay up best front brickwork. This is the final operation, and requires just as much care and attention as any part of the manufacture, and in view of this the Indianapolis Terra Cotta Company some few years ago published some practical rules relating to the setting of terra cotta work, which, if followed out, would be productive of good results.

Doubtless, in reducing this paper to a brevity in order to relieve it from getting beyond the allotted time, and the subject being such an extensive one, many things may have been left unsaid, but in the discussion that may follow, these may all be brought out, and I would add that much valuable help on the subject of terra cotta can be obtained by perusing the Brick Builder, published in Boston, and the Clay-Worker, published in Indianapolis.



Written for the CLAY-WORKER.

### CLAYWORKING IN DENMARK.



IN THE LITTLE ISLAND of Bornholm, about 75 miles southeast of Copenhagen, are practically the only clay resources of Denmark, and yet in this small space there are china-clay pits, fire brick works, and factories for the manufacture of vitrified brick, building brick, paving tiles, terracotta ornaments and earthenware potteries. With so much to excite my interest I took the little steamer from Copenhagen one evening and arrived at Ronne on the island of Bornholm early the following morning.

Ronne, which is in the center of the clay-working industry, is one of those curious little Danish towns, so quiet that every day of the week seems like Sunday. A half hour's ride from the village brought me to the kaolin pits.

The island of Bornholm is a granite mass, which in places is decomposed into a mass of kaolin quartz. At the pits of the Denmark Chamotten Fabrik the kaolin is known to have a thickness of 240 feet, while the pits are 70 feet in depth. As is the practice at many other European localities the poorer grades of the material are not discarded, but are used for the manufacture of firebrick. The whole mass of kaolin and quartz is sufficiently loose to permit its being easily mined by picks and shovels, after which it is loaded into cars and drawn up to the washing machines by means of a cable. The good material is discharged into the stirring vats, where all lumps are thoroughly broken up by rotating iron arms, after which it



Street in Ronne, Bornholm Id., Denmark.

passes along a series of troughs where most of the sand is dropped, and then passes through a series of stone tanks, in which more sandy, but continually finer particles are dropped. In the last tank are the finest settlings or best kaolin. No sieves are used throughout the whole process. Some of the kaolin is used for pottery purposes in Copenhagen, but most of the supply is utilized by paper manufacturers.

At Hasle, north of Ronne, the Denmark Chamotten Fabrik has another factory, which uses the bedded clays for the production of vitrified brick or "klinkers" as they are called, and it is interesting to see how much pains is taken with the material. The clay is allowed to soak in long troughs for eight days before being used. It then passes through a pugging

mill, after issuing through which it goes through still another one in connection with the stiff mud plunger machine. At the Hasle works, the brick are dried on pallets before being burned in the continuous kiln, but at the fire brick works the drying is often done on top of the continuous kilns, either set directly on the kiln roof or on racks. This latter method is not at all an uncommon one in many parts of Europe. The fire brick are always molded by hand, and spread out in the sun until dry enough to be carried to the racks on the kiln. At both the fire brick and "klinker" brick works continuous kilns are used. The better grade of "klinkers" are repressed and used for sidewalks, but the "klinkers" are never used for paving roadways.



Kaolin Pits of Denmark Chamotten Fabrik, near Ronne.

All through Europe, in fact, vitrified brick are used to an enormous extent for sidewalks, but never for wagon roads or streets.

Those members of the N. B. M. A. who attended the Atlanta meeting, will probably remember the beautiful display of terracotta figures and reliefs from Copenhagen. This branch of the clayworking industry has its origin on Bornholm, and is still carried on there to some extent, although the largest factories are in Copenhagen. The clay used is all dug in the vicinity of Ronne, and much of it lies on village property. Such clay can be used by the manufacturer free of cost provided he makes his wares in Ronne, thus benefiting the town indirectly. The different colors are obtained by using the clays singly or by making mixtures of them. A simple washing process frees the clay from grit. Some of the objects are turned on the potter's wheel, but most of the reliefs and statuettes are formed in plaster molds. The beautiful works of the Danish sculptor Thorwaldsen, in the Museum at Copenhagen, furnish an endless series of pleasing designs which the Denmark terracotta manufacturer has not been slow to copy. These terracotta objects are so simple and cheaply made, and form such a tasty product that it is surprising that there have not been more imitators of them. The vases after being burnt are decorated by various colors of great delicacy, but are not fired again.

HEINRICH.

### PROSPECTS FOR GOOD BUSINESS.

Some time ago we warned those who intended building this season to hasten their preparations and give out their contracts before the building season is well advanced, as there were indications of a rise in nearly everything that enters into the building trades. Already, in some districts, there has been a rise in prices of lumber, bricks, and some lines of hardware, and, as Canada threatens to impose an export duty on logs, a further advance will surely take place in prices and other



building timber of all grades. Intending builders will act wisely in bestirring themselves and completing their arrangements and asking for tenders for their work without delay. From what we can learn from the press, and from correspondents in many parts of the country, there never were so many plans ordered by prospective builders as at the present time, and if only one-half of them are used, the prospects for a good season's work are assured.—National Builder.

Written for the CLAY-WORKER.

### THE STORY OF THE OLD BRICK FORT.

IT SEEMS BUT NATURAL that that valuable product of the clayworker, brick, should play an important part in affairs that so nearly concern humanity and progress in relation to the "peaceful arts," but one would hardly look upon this most useful adjunct of material advancement as being a great factor in affairs of war. And it is true that latter-day "belligerent science" no longer relies upon the brick for defensive purposes; but there was a time—not so many years removed from the present—when burned clay formed no inconsiderable surety against the aggressive attention of an enemy. In the early part of the present century brick were extensively used in the construction of forts, the ruins of a number of which can be seen in various parts of the country. A very old fort built of this material is located in Florida, and some, of a later date of construction, form a part of government property in California, North Carolina, South Carolina and elsewhere, illustrating the fact that hundreds of years after heavy ordnance and big cannon balls came into use, brick still "held the fort," and were considered very good things to get behind.

The writer of this has in mind an old brick fort, which for nearly eighty years has lifted up its walls of hardened clay where the Atlantic beats upon the shore and stretches away toward the distant horizon; where the ships of the world sail by with freight from many lands, and where the thunders of war once reverberated over the restless sea. This fort (Caswell by name) was built in 1820, six years after the war of 1812-14. The many thousands of brick of which it was constructed were made—of course, by hand—on the banks of the Cape Fear river, a few miles from its mouth, at the northwest side of which the old fort is located—a plain case of "from hand to mouth." This is a poor pun, but one that may serve to "hit off" the ancient method of brickmaking.

Fort Caswell is built upon a point of land, on the North Carolina coast, which is formed at the mouth of the river by an inward sweep of the latter just before it enters the sea. On the north, and stretching away to the little town of Southport, sleeping amidst groves of old evergreen live oaks, is the bay, made by the bend of the river, where ships lie at anchor, and where, more than a hundred years ago (on August 8, 1775), Josiah Martin—the last of the royal Governors of North Carolina—while on board the British ship of war "Cruiser," issued his famous proclamation against the cause of American liberty. This proclamation was particularly hostile to the Mecklenburg Declaration of Independence, which was issued on the May previous.

On the southeast side of the river's mouth is Smith's Island, which is about four miles long and two miles wide. A peculiarity of this island is its sub-tropical climate, caused by a shoreward sweep of the gulf stream in this neighborhood, which favorably affects the growth of palmetto, wild olive, youpon, and a thick jungle growth—products common to warm atmosphere. During the civil war a number of forts were built on this place for assisting Fort Caswell in protecting the harbor. The main entrance channel, now near Smith's Island, in time of the war ran right under the guns of Caswell, and to their

protecting menace many hard-pressed blockade-runners owed safety from the busy enemy.

When President Lincoln, on the 19th of April, 1861, issued his proclamation for the blockading of the coasts of the Southern States, the Carolina coast was not included. It was not until the following July that this, the most important of the Southern coast ports, was declared blockaded and the Federal steamer "Monticello" sent to catch the daring traders.

The South, being dependent upon England for most of its foreign supplies, furnished a great source of wealth in its cotton product to the English trader, who, owing to the immense profit in the business, took great risks in running the blockade. As the neutrality law prevented direct trade with England, the cotton was taken to intermediate ports, and from these transferred to its true destination. The principal points for neutral trade were Nassau, Bermuda, Havana and Matamoras. The first of these places was commercially the most important; but Bermuda, though second in extent of its trade, was nearest to the Cape Fear port, the place, especially in the latter part of the war, most sought by the blockade-runners.

The ships employed for this purpose were built for speed—and they needed it, a fact for many years set forth in the iron hulls of venturesome craft that, failing to elude the blockader, were beached and left to the mercy of the destructive breaker.



Clay Pits at Hasle, Bornholm Id., Denmark.

In pursuing the blockade-runners the Federal ships would often come near the fort, and then the dogs of war would bark until the bold chasers drew off and took up the systematic patrol of the sea. If the swift trader succeeded in escaping capture, she glided over the bar and into the bay under the shadow of the fort, from there proceeding up the river with her much-needed cargo of arms, ammunition or other things brought from the thrifty foreigner.

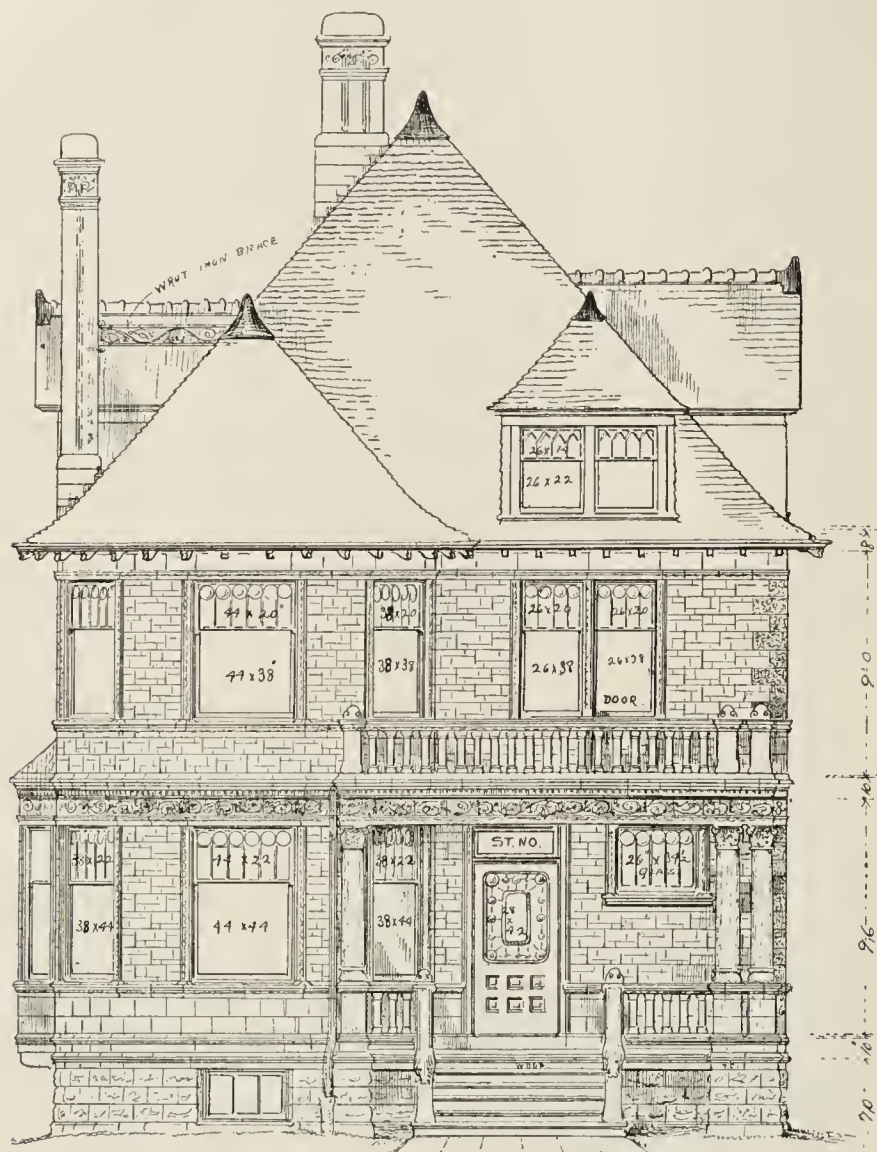
At the time of these stirring events Fort Caswell was half a century old; its walls had taken on the hue of age, but it was, of its kind, a powerful and striking example of walled coast defense. The brick structure formed a hollow square, in which were the quarters, also built of brick. From the square a wide passage opened upon a drawbridge which spanned a moat when down and was to be raised when an enemy had carried the outer works. When the drawbridge was up, huge doors, studded with iron spikes, were closed by heavy swinging weights attached to long metal bars and big chains—apparatus much after the fashion of that used in protecting ancient castles.

The brick structure was very deep. It contained large rooms employed for the storage of ammunition, and in the outer wall were long galleries flanking the moat on all sides. In the galleries, and separated by short spaces, were arranged perpen-

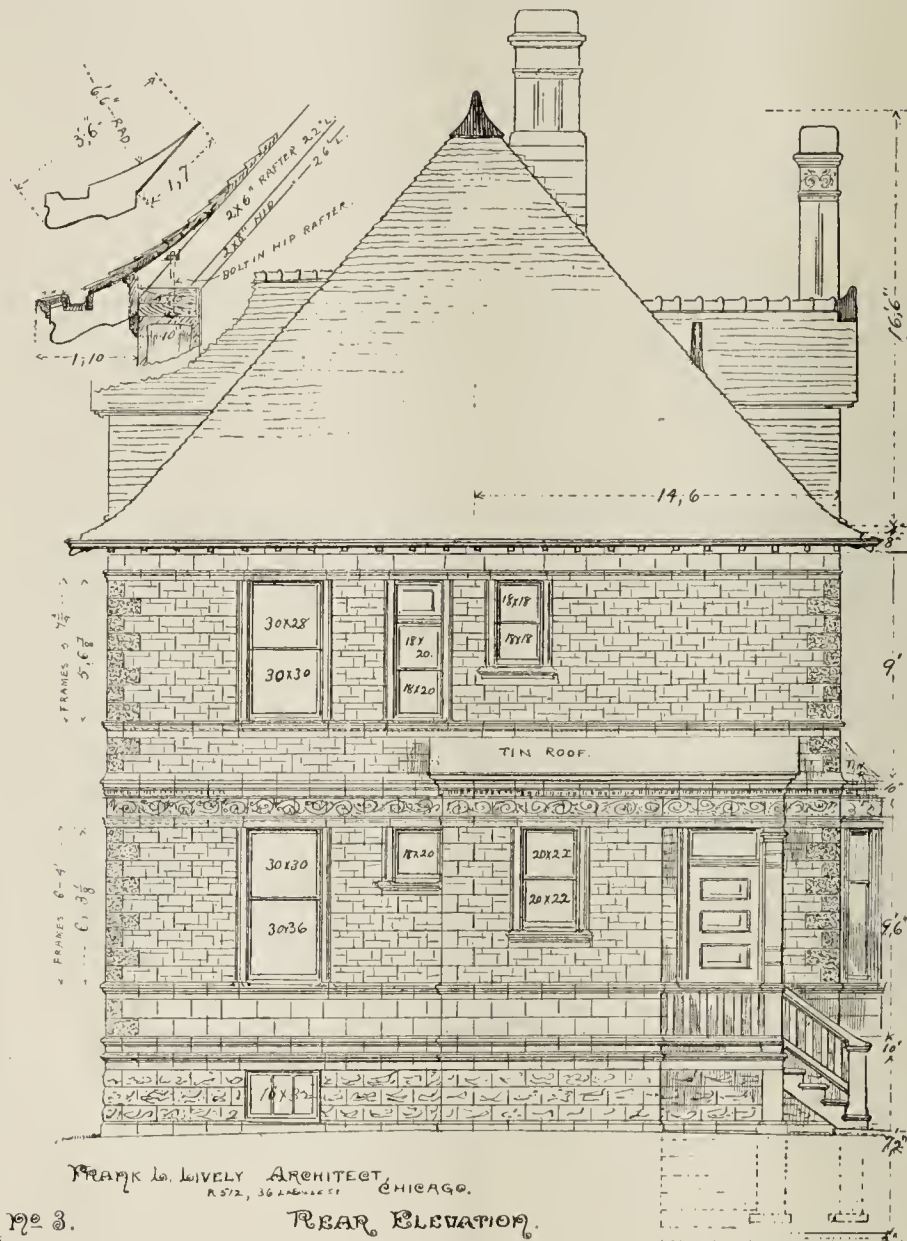


dicular narrow openings, commanding all approaches, where men—two at each port—with crossed guns pointing in different directions, could make it warm for those who endeavored to cross the moat. The latter was contained within brick walls, the outer one of each side of the square being flanked by an

ranged igniting fuses, and, applying the match, left the forces of destruction to work their will upon the ancient landmark that was built by men of old to keep back a possible foreign foe. Like bolts of lightning sped the fiery trains; they leaped like blazing demons into the vaults where thousands of pounds



FRONT ELEVATION OF ROMANESQUE RESIDENCE, No. 3.



REAR ELEVATION.

outer earthwork, which formed a formidable protection for the strong yet more easily destroyed defense in brick. The whole quadrangle of the latter had its top covered with earth, but the perforated walls were bare and grim, from the top to the bottom, where the dark water of the still moat reflected the black cannon that overhead pointed over land and sea and waited patiently for a target. These came occasionally during the late war, but not in battle array; the fate of the old fort was to be settled in a different manner. It had stood for half a century watching at the main gateway of the State, without causing a drop of blood to be shed; and now, when the enemy came with his great ships and great guns, he began belligerent operations nine miles further up the coast (at Fort Fisher, on New Inlet), and there made heroes and history. But still the great decisive battle at Fort Fisher had a most remarkable effect upon the old brick fort at the mouth of the river.

On the 15th of January, 1865, after an awful cannonading, followed later in the day by an onslaught of land forces and a fierce and bloody struggle, Fort Fisher yielded to the adverse fortune of war, and, being then the key to the Cape Fear river, allowed the passage of New Inlet—since closed up—and entrance to the stream that led to the chief city of the State, Wilmington.

Immediately upon the fall of this important stronghold of the South, the Confederate forces of the lower Cape Fear began to leave; the various forts were ordered to be evacuated, and soon this part of the country was left to the advancing invader, who came as a conquerer, but not as a ruthless soldier.

When Fisher's fate had made Caswell of no more use to the Confederates, the latter, before leaving their brick-built security, carefully laid long trains of powder to the magazines, ar-

of powder and piles of loaded shells were stored, and in an instant the very heavens trembled, a volcano of fire shot skyward, and the roar of destruction stilled the voice of the thundering sea, reverberating over forest and ocean the story of the Lost Cause.

What a picture of the result of unharnessed fury that once picturesque old fort presented when the sun rose upon the work of that terrible night! The long galleries and rooms were rent, with gaping cracks extending in many directions; brick roofs in a number of places lay piled in confusion on the ground, while the ravages of fire were seen where there had been woodwork to burn. The walls of the fort were in some places broken and thrown down, but a large portion of this part of the structure remained standing, and still preserving in some measure the general contour. But its grandeur and warlike appearance were forever gone; it would never be rebuilt upon its old lines, for progressive warfare demands forts of sand or steel—the first to envelope the almost irresistible modern projectile, the second to prevent its entrance.

Over the ruins of Fort Caswell the writer has wandered many times; for, while not praying for "belligerent rights," he likes to note the manner our forefathers prepared for war, and to mark the contrast between "ancient" and modern methods. The old fort became a beautiful place as time went on, and Nature, with her ever-loving hand, began to cover with verdant growing beauty the broken walls, where the ivy clings and rustles in the sea breeze that softly croons the Story of the Old Brick Fort.

Some day (or night)—who knows how soon?—an enemy may come across the sea, steaming, on dire destruction bent, straight for the Cape Fear port. If he does, he will find a warm greeting. The mouth of the river is now guarded by a splendid electric torpedo system, managed by a shore station; and not far from this station Uncle Sam has recently builded him a fort, from which are frowning out over the ocean some very fine

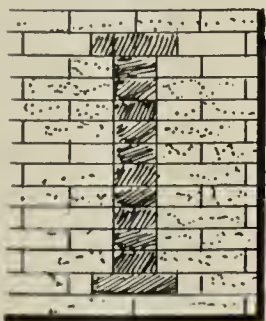


coast defense rifles, ready to make "hot presents" to any floating aggressor that has not sense enough to stay at home. And not only in this historic coast neighborhood has our national uncle prepared on a large scale for war, but up and down the coast, at various places, can be seen big cannon, dominating all important harbor approaches, which in time of war are sought by the enemy.

Written for the CLAY-WORKER.

# THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Twelfth Paper.

BY E. G. DURANT.



IN OUR ELEVENTH PAPER, published in the May issue of this journal, we treated of chimneys, and only incidentally in connection therewith called attention to the "air" or ventilating flues, shown in the cross-section sketches. We believe this matter of the ventilation of dwellings especially worthy of our attention at this point, and that it is a matter of vital importance to every man contemplating building a house. While we shall refer specially to ventilation of dwellings, it will be apparent that the principles of construction involved are equally desirable for and applicable to all habitable structures.

Comparatively few persons have given this subject more

before, mainly because our boards of education, having in charge the interests of our public schools, are becoming enlightened as to the importance of the subject, and our architects and the manufacturers of ventilating apparatus are vying with each other in presenting both the best plans and the best outfit for securing desired results.

Our public school teachers, it is but natural to suppose, will, if they have not already, become important factors in the dissemination of the truths connected with this subject.

What we hope to do is to show how readily, naturally and inexpensively hollow building blocks may be made to fill a most important place in this movement.

Of course the intelligent clay-worker will be interested to learn what part clay wares may be expected to take in this crusade for pure air, whether he be brickmaker or blockmaker.

It is because we are convinced that hollow blocks possess natural adaptations for this line of work beyond those found in any other building material, when supplemented by the new features already presented in these papers, viz., the air flues in connection with the chimney flues, and the top and bottom preparations in wall block (heretofore referred to), that we feel warranted in taking space to develop the matter somewhat in detail for the readers of the Clay-Worker.

There is no habitable room in a dwelling that should not be provided with sufficient means for ventilation.

## —Doors and Windows—

Are not to be classed as "efficient means," although to-day a



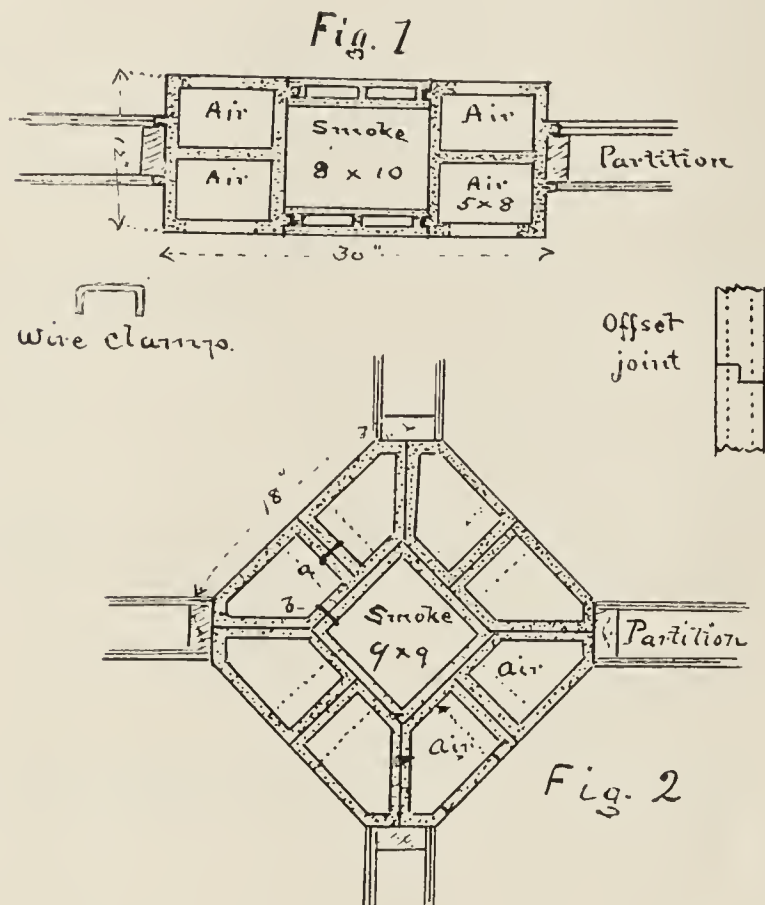
than a passing thought, and yet it plays as large a part in the vital statistics of the nation as any other factor pertaining to the homes of the people that can be mentioned.

It is now receiving a larger measure of attention than ever

majority of our dwellings possess no other. A window ajar is a constant menace to health when so employed, at least when there is not nearly an equilibrium between the internal and external temperature.

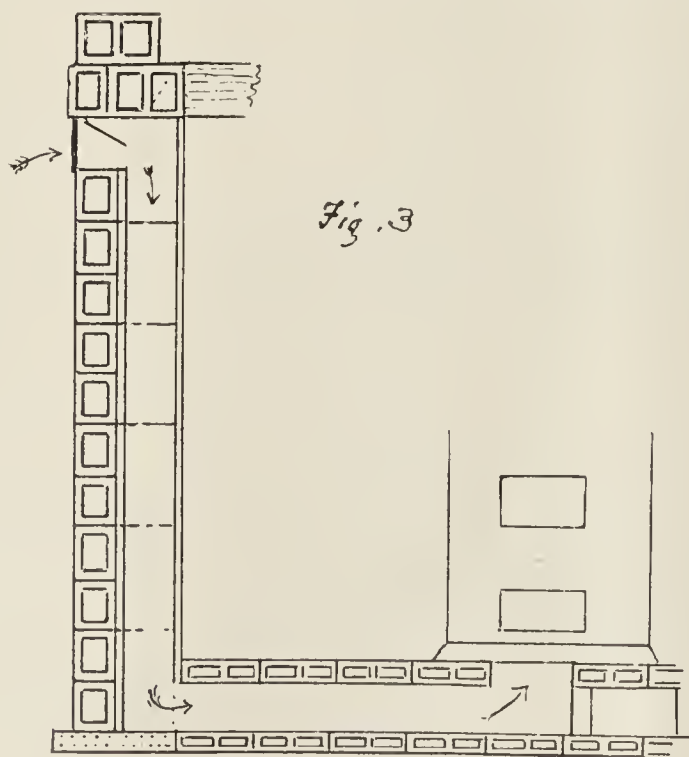


The occupant of a dwelling unprovided with sufficient means for ventilation has, in our northern and central regions, for at least eight months of each year, only a choice between the two evils, viz., the poisoning of the system through the breathing of impure air, or the constant menace of a cold, which may end



in pneumonia or consumption, or any one of a dozen other ailments which a "cold" may bring in its train. The writer refers feelingly to this matter, since a harrassing cough, often indulged in while writing this paper, is a legacy of such an attempt at ventilating his temporary quarters in the "Windy City."

It is probably safe to say that not more than one dwelling in fifty in the United States can make a show of any definite provision for ventilation, in whole or in part. Languor and headache in the morning, weakened constitutions, systems poisoned, lives made a burden, and enough paid out in physicians' bills, otherwise uncalled for, and for patent nostrums, each year, to pay for a proper system of ventilation—the aches



and pains, the disabilities and distresses, being thus a net profit (?) on the non-investment in a pure-air fund.

#### —Methods of Relief.

Our first resort must be in connection with our chimneys,

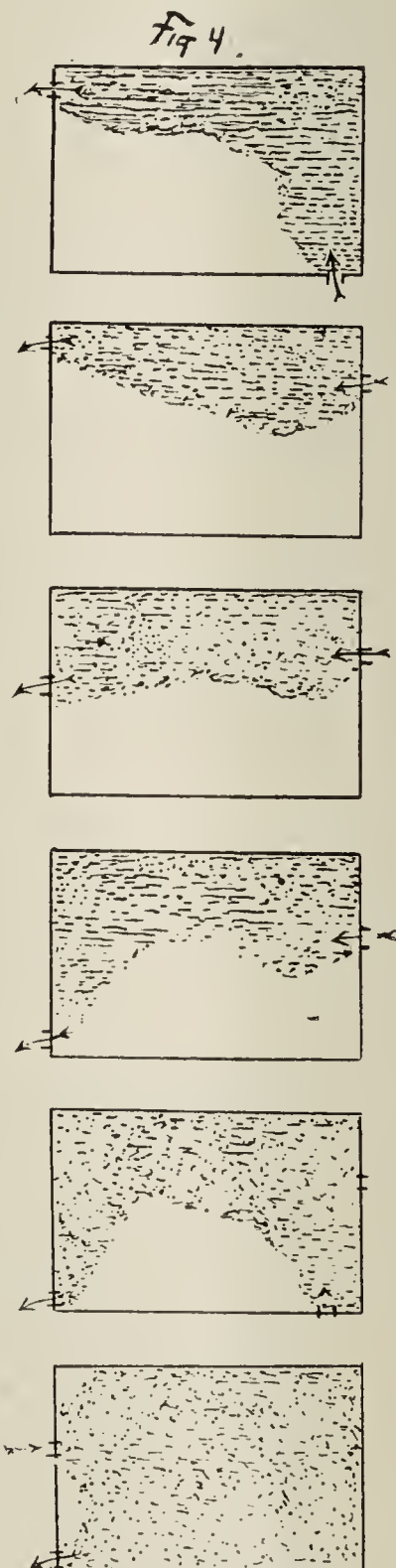
which should be equally adapted to use in structures of any and all building material.

We begin with the simplest forms of chimneys for inside or partition walls (having shown, in former paper, flues in outside walls), adapted to the modest cottage or the mansion, so far as the principles or methods involved in the construction have a part.

In Fig. 1 is shown the cross section of a chimney with ventilating flues as appearing in a partition wall and adapted to the ventilation of two apartments on the same floor. The dimensions are given in the sketch that it may be seen how unobtrusive a chimney constructed on this plan may be, while yet having a good smoke flue capacity for a two-story dwelling, ample to provide for the contents of two six-inch stove pipes and supplemented by four air flues of sufficient area to carry off and to admit air that may be passed through 6x6-inch registers which are a small size, such flues as will, with a difference of twenty degrees between external and internal temperatures of dwelling, discharge from and pass into an apartment about 4,500 cubic feet of air in an hour, assuming the chimney to have a height of twenty feet. (We make provision for receiving and discharging the volume of air referred to, but do not stop here to discuss the details.)

Giving our attention again to present conditions as found in most of our dwellings, and to current methods attending the erection of wood and brick buildings (we may add hollow block to the list), we find in almost every case that chimneys are built for the disposal of the products of combustion only, and perhaps 75 per cent. (we might safely say 90) of the house building fraternity, and an equally large per cent. of their clients, will be ready to inquire with curious interest—if the subject of ventilation were not under discussion — "What more would you ask of a chimney?"

We answer, we cannot ask more of the ordinary brick chimney, but we are contending here for something more. A brick chimney may be built with air flues connected that, if carefully built, will serve a good purpose in the disposal of foul air, but at considerable cost of room and money, while a block chimney, with air flues, need cost no more than an ordinary chimney of brick for the passage of smoke only, designed for the same number of apartments. It is well understood, and our best writers on heat and ventilation state that a smooth clay pipe lining, inclosed within the walls of a brick chimney adds very largely to its efficiency. We think the admitted difference is 20 to 25 per cent. The intelligent brickmaker using an auger machine will do a good thing for the community in which he lives by securing a die or two, if he has good clays for the purpose (and almost any well-prepared and well-burned clay may be called good), and encourage his neighbors to improve on old conditions by furnishing them up-to-date material.





We give another illustration in Fig. 2 of a chimney so placed as to do service for four rooms on the same floor and with two ventilating flues for each room. This chimney will not be objected to because it is set at an angle to the walls of the rooms. While it has great capacity, it is but twenty inches square. The house builder who has any conception of the value of ventilation will be willing to make some effort, and, if need be, some sacrifices, to incorporate in his plans an efficient ventilating system.

Referring to the sketch, the dotted lines indicate the entrance of pipe to smoke flue, necessarily passing through a small portion of the air flue, but the heat which the pipe imparts to the flue will add to its efficiency. Of course the openings in the air flues will be on a different level.

In Fig. 1 it will be noticed that the smoke flue is composed on two sides of the walls of the air flue blocks, while the other sides are hollow blocks, but two inches or three inches deep as the case may be. While we do not deem it necessary to a good

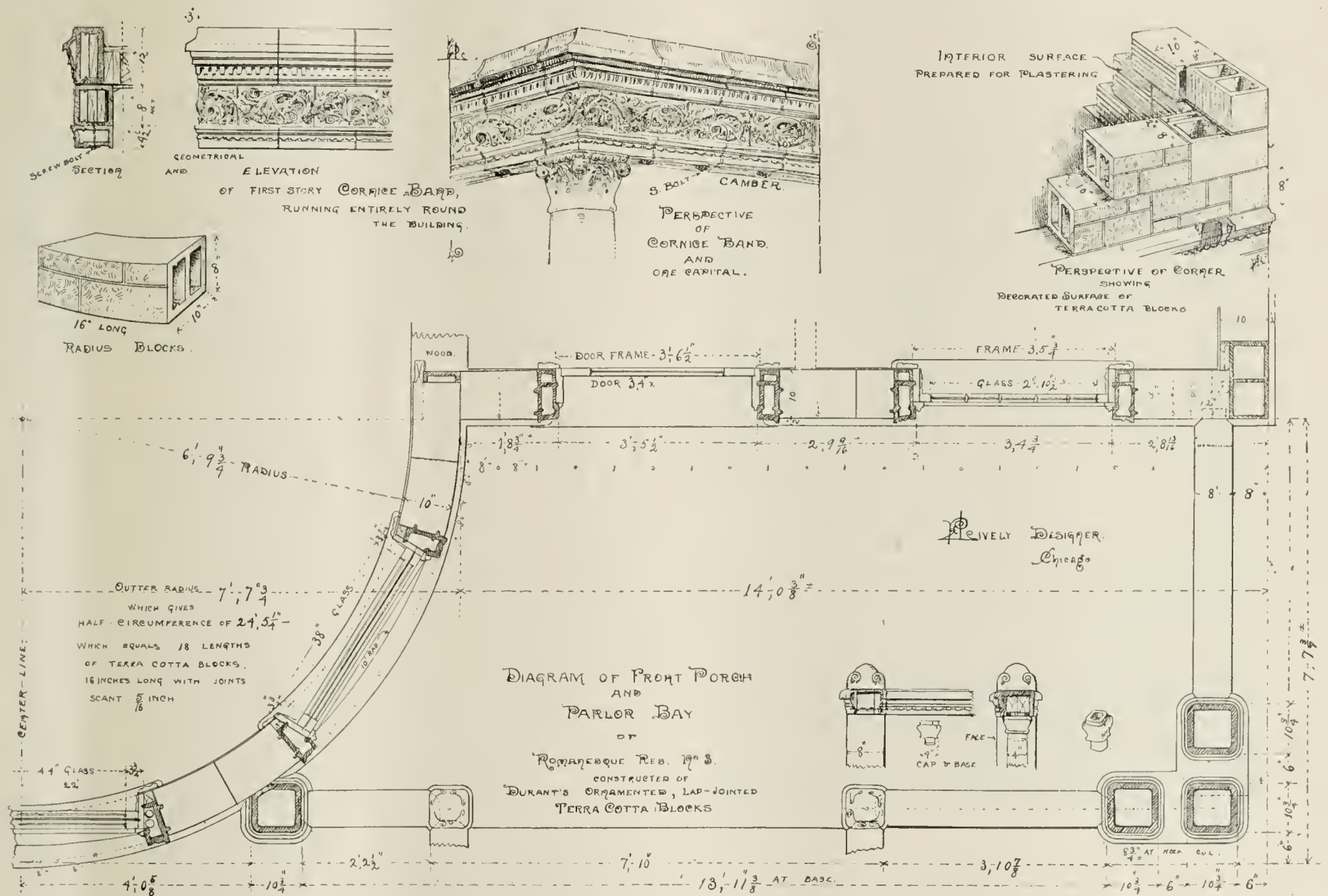
would be one way of co-operating with the Lord in securing such desired blessing. The fact, briefly stated, is: No cubic foot of impure air can be discharged from an apartment without the admission of a corresponding volume of air to take its place.

If this is true, from whence shall this air come? We can state from whence it does ordinarily come, in a stove-heated apartment:

Through cracks about windows,  
And cracks about doors,  
While the walls yield their quota  
Through millions of pores.

We do not forget that, as a rule, we do not dismiss foul air save as we lift or drop a window, or open a door into some adjacent apartment but we are discussing the desirability and the necessity of doing so, and hence we need to inquire from whence we are to draw a fresh supply.

In hot-air, hot-water and steam-heating furnaces an inlet



job, to meet any doubts that may be felt as to the sufficiency and efficiency of said blocks as to making a solid and permanent structure, we sketch a little wire clamp that may be used to tie the blocks together. At "A" and "B" in Fig. 2 such ties are seen in use. Again, to prevent moisture which may enter the top of the chimney from doing any damage to interior wall finish, an "offset joint," shown in the sketch, may be used, the lowest section of the joint being placed, of course, on the inside of the flues.

We drop for a moment the discussion of blocks to impress one fact upon the minds of our readers—a fact, no doubt, known to most, but one nevertheless lost sight of and evidently made of no account when it comes to practice, as present prevailing conditions attest.

If this "fact" was coined into an axiom it would be worth printing in letters of gold and well framed, given a place on our walls as a companion piece to the one often seen, "God bless our home," for to observe it and make provision for it

of fresh air is secured by passing it through the space between the outer jacket of the furnace and the furnace proper. We propose in the use of hollow blocks to do three things. First provide the best possible way for supplying the furnace with fresh air; second, provide the best method of introducing this air, when heated, into the several apartments, and, third, to dispose in the very best manner of the vitiated air.

In Fig. 3 is shown a cross-section of a basement wall and basement floor, with a partial view of a furnace to which our block flues convey fresh air. It will be noticed that a wall register is placed under the water table course, having a drop valve that may be operated from the floor above the basement if desired. Such a register may be large enough to take the place of an 8x16 block, or two of them if necessary, and connect with a vertical wall flue which conveys air to right angle flue under the basement floor and thence to the furnace. Such flues should, of course, be carefully cemented at the joints to exclude moisture.



In this connection it is proper to consider the methods now generally employed for such use.

Very often a clumsy wood air conduit looks out upon us from a basement window, a portion of the glass of which has been removed for its accommodation. After having dropped to the floor level of the basement, it trails its ugly length to the furnace, and is often found in dangerous proximity to an accumulating pile of ashes. It is usually garnished with checks, open seams and loose knots or knot holes, through which the vitiated air of the basement, including often the aroma of the vegetable cellar is drawn, and by a most natural process carried to the apartments above. Sometimes this wood conduit is improved upon by the substitution of a galvanized iron pipe, which, with its easy fitting joints, does the same kind of work, while presenting a more genteel appearance. Discussing this matter with an architect recently, in good faith and in all seriousness, he remarked, "But this foul air ought to be removed from the basement," the seeming reflection being "Why not in this way?" I have ceased to look for sympathy in my plans from this particular quarter.

In place of the wood or iron "contraptions" just described, which always give one the idea of a temporary makeshift, like the staging about a building during its erection, we present a smooth, glazed conduit, forming a part of the wall and placed where it leaves our basement free from obstruction and our basement windows are left in a normal condition for service as such.

We have thought it well to introduce as a basis for the further consideration of the subject a series of six sketches which are included in Fig. 4, which have special value in a study of the combined question of heating and ventilation which subjects can never be divorced where heat is to play a part.

This series of sketches embodies the result of experiments made by Mr. Warren R. Briggs, of Bridgeport, Conn. Each separate parallelogram represents the cross-section of a glass compartment employed by Mr. Briggs in his experimenting. Steam and smoke were admitted into this compartment in order to render the heat current visible to the eye. In the sketches the shaded portion shows the heat current, and the arrows will indicate where the heat enters and where discharged. It will readily be admitted that these experiments explode some old and generally accepted opinions concerning the proper level for the introduction of heat into an apartment, but here again we are confronted with the fact that it is because provision is so rarely made for the disposal of the tainted air that our opinions need revising when we make such disposal. Where heated air is merely brought into a room, and must find its own unassisted way out, it makes avenues of every crack and takes advantage of every door opening, and, of course, becomes diffused throughout the apartment, whether its entry be through floor or baseboard. Its ingress is choked because of lack of proper channels for egress, and we have our unventilated and unsanitary living and sleeping apartments.

Having thus presented the principles involved, well illustrated and accentuated by Fig. 4, let us briefly call attention to the part which hollow block vertical flues, located either in the walls of the building, or in connection with chimneys, where such are available, may be made to play in furtherance of a more perfect system than now prevails. We will first consider the furnace-heated house. It will be apparent that our heat pipes in the basement may convey the heated air to a properly located wall flue extending to the basement, and that such heated air may thence be conveyed to any desired height before discharging into any room. Of course this may be done by sheet-metal conduits, which are rarely made use of save in connection with partition walls, it not being considered good practice to place in outer walls, because the exposure is sure to rob the conduits of such a large per cent. of the heat being conveyed. Then, if we propose to both heat and ventilate,

good practice, as the last section of Fig. 4 will show, demands that our discharge flue be on the same side of the room as our inlet flue. Whereas the lines of partitions are very frequently broken from floor to floor, in the house constructed of blocks we may make use of the outer walls, because an air chamber is interposed between our heat flue and the cold exterior, and what is as essential to the efficiency of our foul air flue, its warmth is maintained to the point of dismissal of its contents at a point under the eaves, or at the chimney top, as the case may be.

When it comes to the millions of stove-heated homes, the same principles apply, but the application of a remedy is more difficult, for it must be taken into the account that fresh air admitted, since it cannot pass within the jacket of a furnace, will have to be taken in in quantity to meet the sanitary requirements of not less than 2,000 feet per hour for each occupant of a room, with due allowance for the disposal of the products of combustion from lamp or gas jet, and must be taken in at nearly the prevailing external temperature, be it zero or several degrees below.

These difficulties can be met, and how, may be shown in a later paper.

So little has been said of ornamental blocks in this paper that we take occasion to add some of the details and the elevations of a Romanesque dwelling planned to be constructed of hollow blocks by F. I. Lively, of Chicago. The foundation blocks to water table to be glazed and of a red sandstone hue, the body of the walls above water table to be buff, and the belt courses and casings, as well as the corner blocks, to match the foundation in color.

#### THE CERAMIC ASSOCIATION OF THE OHIO STATE UNIVERSITY.

IN THE MEETING of May 17th Mr. Watts opened the programme with a well and carefully written account of the manufacture of stoneware. He considered the theoretical as well as the practical part of the business, and having had some years' experience in the stoneware line, he was enabled to treat the practical details quite fully. After the usual discussion the question: "In a given kiln what is the more economical way of burning, direct firing or the use of gaseous fuel?" was considered. In the discussion following it was supposed that the gas generators are located as close to the kiln as possible. Mr. Bleininger proved mathematically that gas firing is the more economical method. Fuel in the gaseous form comes nearest to the theoretical requirement of air while with solid fuel at least double the theoretical amount of air that must be introduced. This, of course introduced the heating effect. The calorific intensity of carbon burned with double the theoretical amount of air is 40 per cent. less than that burned under the theoretical condition. Other points made were as follows: The heat can be generated just where it is wanted, the kiln can be regulated much easier, the gas can be distributed to any part of the kiln, the cost of labor in burning is reduced and the work is of a less severe kind there is no loss of heat due to the inrush of cold air when cleaning grates, and finally, a lower grade of fuel may be used. The meeting was closed with a delightful guitar and mandolin performance by Messrs. Barringer and Caul.

The last meeting of the college year was held May 31st. First on the programme was Mr. Walter Fiske, who read a paper on "The Technical Investigation of Kaolin." The matter was illustrated by blackboard diagrams and tables. This was followed by a review of the year's work and talks by the older members, who recalled the early history of the society, and urged the younger members to do their best to keep the Association, not only at its present standard, but keep on improving it. The matter of issuing diplomas for two years' attendance was considered. A vote of thanks was extended to the officers for efficient service rendered by them.

President Bleininger closed the meeting with an appropriate talk, in which he thanked the members for their hearty cooperation and asked them to continue to hold steadfast to the cause of ceramics.



Written for the CLAY-WORKER.

THE DIVERTING HISTORY OF JOHN GILPIN.

BY MRS. MARY E. NEALY.

THIS BEAUTIFUL PITCHER is made in relief of Rockingham ware, and is much in the same style with the Tam o'Shanter piece. In both the story or poem is told in relief, the paste, in lavender color, being the same all through. Both were made about 1835 by Hanley, of Staffordshire, and show great skill in modeling, as well as great imagination in designing. This poem was written by Cowper, after a serious attack of melancholia, in 1782, and was first published in the Public Advertiser in London, but was not acknowledged by him until the publication of the second volume of his poems. His friend, Mrs. Austen, in striving to cheer his spirits, told him the story, which she had heard in her childhood. He wrote the verses in a night, and it pleased the English people so entirely that it made Cowper famous—which achievement he had hitherto failed to attain. The poet died in 1800.

The writer possesses one of the oldest American editions of Cowper's poems, published in Philadelphia in 1806, and "Printed for Benjamin Johnson, Jacob Johnson and Robert Johnson." In the second volume is the story of "John Gilpin," in sixty-three four-line verses, two scenes of which are represented upon the beautiful ice-pitcher. In the scene shown he is going back toward his own home again, "because his horse would go," while the ladies from the window cry out: "Stop! Stop! John Gilpin! here's the house." He had passed this house before "because the horse would go," and because it was entirely out of his power to stop or check him. But a few verses will better explain:

"John Gilpin was a citizen  
Of credit and renown—  
A train-band captain eke he was  
Of famous London town.  
"John Gilpin's spouse said to her dear:  
"Though we have wedded been  
These twice ten tedious years, yet we  
No holiday have seen.  
"To-morrow is our wedding day,  
And we will then repair  
Unto the Bell at Edmonton,  
All in a chaise and pair.  
"My sister and my sister's child,  
Myself and children three,  
Will fill the chaise: so you must ride  
On horseback after we.'  
"He soon replied: 'I do admire  
Of womankind but one,  
And you are she, my dearest dear;  
Therefore, it must be done.  
"I am a linen-draper bold,  
As all the world doth know,  
And my good friend the calender  
Will lend his horse to go.'  
"Quoth Mrs. Gilpin: 'That's well said;  
And, for that wine is dear,  
We will be furnished with our own,  
Which is both bright and clear.'  
"John Gilpin kissed his loving wife;  
O'erjoyed was he to find  
That, though on pleasure she was bent,  
She had a frugal mind."

The morning came, and, lest their neighbors might think them proud, they had the chaise stop three doors off, where they entered, and the ladies and children started. But the happy husband was stopped by some customers, and then Bettie came down and said that the wine was forgotten. He called for a strap, which fitted in the ears of the bottles, and fastened it about his waist. Then he donned his red cloak, which covered the jugs from sight, and so they started. The horse was lively and began to trot, "which galled him in his seat." John leaned forward and grasped the horse's mane. At this—

"His horse, who never in that sort  
Had handled been before,  
What thing upon his back had got  
Did wonder more and more."

The horse went fast and faster; the cloak flew backward; the loops and buttons flew off and the cloak was lost; the wig and hat went after them; the fowls flew across the road; the jugs rattled against each other and broke, spilling all the good wine behind. The good neighbors thought he was riding a race, and "that it was for a thousand pounds." He reached Edmonton, but could not stop, because the horse's "master had a house, full ten miles off at Ware." His wife screamed "Stop! stop! John Gilpin," as he passed, but with no effect whatever. When he reached at last the house at Ware and was asked "why he had come and in such plight," he replied:

"I came because your horse would come,  
And, if I well forebode,  
My hat and wig will soon be here—  
They are upon the road."

When asked to stop and dine he refused, saying that it was "his wedding day, and all the world would stare, if wife should



JOHN GILPIN PITCHER.

dine at Edmonton and I should dine at Ware." He was supplied by his friend with another hat and wig, and mounted the horse, saying to the uncertain animal:

"'Twas for your pleasure you came here,  
You shall go back for mine."

But he boasted too soon, for "as he spake a braying ass did sing most loud and clear." His horse started faster than before; his hat and wig were lost, as the others had been, and, after other incidents, he was taken on—

"Nor stopped till where he had got up  
He did again get down."

\* \* \* \* \*  
"Now let us sing, Long live the king!  
And Gilpin, Long live he!  
And when he next doth ride abroad  
May I be there to see!"

General Blanco claims that there is still a bright future in store for Spain, but as he neglects to mention the place of concealment, it is presumed to be in one of the stores that does not advertise.—New York World.



Written for the CLAY-WORKER.

### A FEW SNAP-SHOTS OF A VIRGINIA BRICK AND TILE WORKS.

THE ACCOMPANYING PICTURES are a few snap-shots taken at our plant on Nansemond river, five miles from Suffolk. We have a capacity of 25,000 per day, which we dry mostly in hacks under sheds; some we hack out of doors. We hack them eight high, direct from the machine, and make both end and side cut. We are using the Michigan machine and pug mill and Potts disintegrator, run by a sixty-horse-power engine. We have a twelve-foot vein of very fine clay,

Jacobs and N. S. Buck. The next spring I bought out H. H. Chesbro and R. Jacobs, and it is run now and for the past three years by H. L. Jacobs and N. S. Buck. We work mostly colored labor, paying from 85 cents to \$1 per day, and work by ten-hour system.

I would be very glad to see some of our other Virginia yards illustrated in the Clay-Worker. H. L. JACOBS, Manager.

### READ THE ADVERTISEMENTS.

The subscriber who fails to read and carefully examine the advertisements in his trade journal frequently misses the valu-



1. Engine House and Kilns. 2. Drying Outside. 3. Noon Day Pastime. 4. Gang in Clay Bank.

which we run to the machine by wheelbarrows. We have two clamp kilns holding 600 M brick. They are built with end to the river, so a vessel carrying 75 M can load within thirty feet of kiln, making a short wheel to vessel. Our principle market is Norfolk, where we now have orders ahead for three million and they are mostly run by schooners carrying from 50 to 75 M. We ship some by barges. It is a run of twenty miles from yard to Norfolk. We also ship to Newport News and Portsmouth. We burn with wood, which we get by vessel delivered at yard for \$2.50 per cord. We burn about eighty cords to the kiln of 300 M, which gives us very good burns. This yard was built about four years ago by H. H. Chesbro, R.

able information contained in it, and thus some times loses opportunities of the highest importance to him as a business man. The advertisements are, in fact, communications on business subjects addressed directly to each reader of the journal, and a careful business man would as soon think of neglecting his morning's mail as of skipping the advertisements in his trade paper. It is in the advertisements that he must seek all that is new, useful and profitable in his line of trade. He must not stop at that, however. When he finds an announcement that interests him he should follow it up by acting upon it, by corresponding with the advertiser and learning all there is to learn about it.—Keystone.



Written for the CLAY-WORKER.

# MODERN AMERICAN FRONT BRICK—Ninth Paper.

—Glazed Brick.—

THE INFLUENCE of the fire gases asserts itself in the watersmoking already, before the physical constitution of the glaze has been changed in the least. The water vapors from the ware and the fuel condense upon the glazed surfaces, giving rise to important chemical reactions. This water of condensation, if coal is used as fuel, contains several harmful ingredients, such as sulphurous, sulphuric and hydrochloric acids. If the glaze contains carbonate of lime, carbon-

fluence upon the metallic bases. Bases, which absorb oxygen but which cannot form basic oxides of a higher degree, take up oxygen from the fire gases, but let it go again as soon as the glaze begins to melt. The oxides of manganese and cobalt are especially apt to do this. This taking up and letting go of oxygen causes bloating bubbles of the glaze. The bubbles caused by the escaping gas give rise to the so-called egg-shell surface. Chromium, a coloring ingredient often used, is affected by the heat in a peculiar way. If the glaze is high in alkalis and lead oxide, part of the chromium oxide oxidizes to chromic acid. The latter volatilizes to a large extent, and the result is that the adjoining portions of glaze and body



1. Hot Floor Dry Shed. 2. Outdoor Yard, Engine House. 3. Filling a Kiln. 4. Superintendent and Setters at Dinner.

ate of lead, oxide of lead, alkaline carbonates, etc., sulphuric acid will be absorbed and the bases converted into sulphates. One of the effects wrought by this chemical reaction is the changing and spreading of colors. We know that most of the colors are oxides, which are more or less attacked by acids and brought into solution. Thus from the colors soluble salts are leached, which run and spread, while the original coloring becomes paler. If the condensation is very strong, the solution carrying the colors may even penetrate the entire thickness of the body and appear on the other side. As soon as the temperature rises and dark red heat begins to show in the kiln the oxidizing and reducing gases commence to exert their in-

fluence upon the metallic bases. At a somewhat higher temperature the influence of the fire gases shows itself in a decided action upon glazes containing lead. Under ordinary conditions we have a continual change of reducing and oxidizing gases, lack and excess of oxygen alternating. If the gases are reducing the lead oxide of the glaze is changed to metallic lead; if oxidizing, the process is reversed and the lead is again converted into the oxide. The reduction of the lead oxide to lead gives to the glaze of black coloration. This discoloration may be removed if oxidizing gases are allowed to act upon the glaze long enough yet quite often the black color will remain. In the latter case the reduction has taken place at the stage when



the glaze commences to vitrify. Every grain of the glaze has been coated with a layer of metallic lead, which is then taken up by the entire glassy mass. The lead being covered with glass is not readily accessible to the oxygen, and re-oxidation is rendered very difficult. On the other hand, if a glaze has commenced to melt without showing any discoloration it will not be very liable to be affected by even long-continued reducing periods, for the same reason—the reducing gases not being able to reach the lead oxide. As long as the glaze is not glassy and its pores are open, oxidation and reduction of the metallic oxide may alternate quite frequently. It is the condition in which the glaze is just at the vitrifying point that determines whether the glaze is to be discolored or clear.

It is obvious that glazes not containing reducible oxides are not liable to discolorations due to reduction. If a glaze free from metallic oxides is discolored or "smoked," the trouble is due to the deposition of carbon during the softening stage, caused by heavy smoke.

Our next topic is the influence of sulphuric acid upon the glazes. This is a subject very much neglected in glazemaking. In most cases no attention whatever is paid to the presence of sulphuric acid; in fact, the writer has seen numbers of receipts in which sulphates are introduced in large quantities, and yet that acid is the cause of some of the greatest troubles in glazing work—troubles which are the more perplexing, as the practical man has no explanation for them. Sulphuric acid is to glazes what phosphorus is to steel.

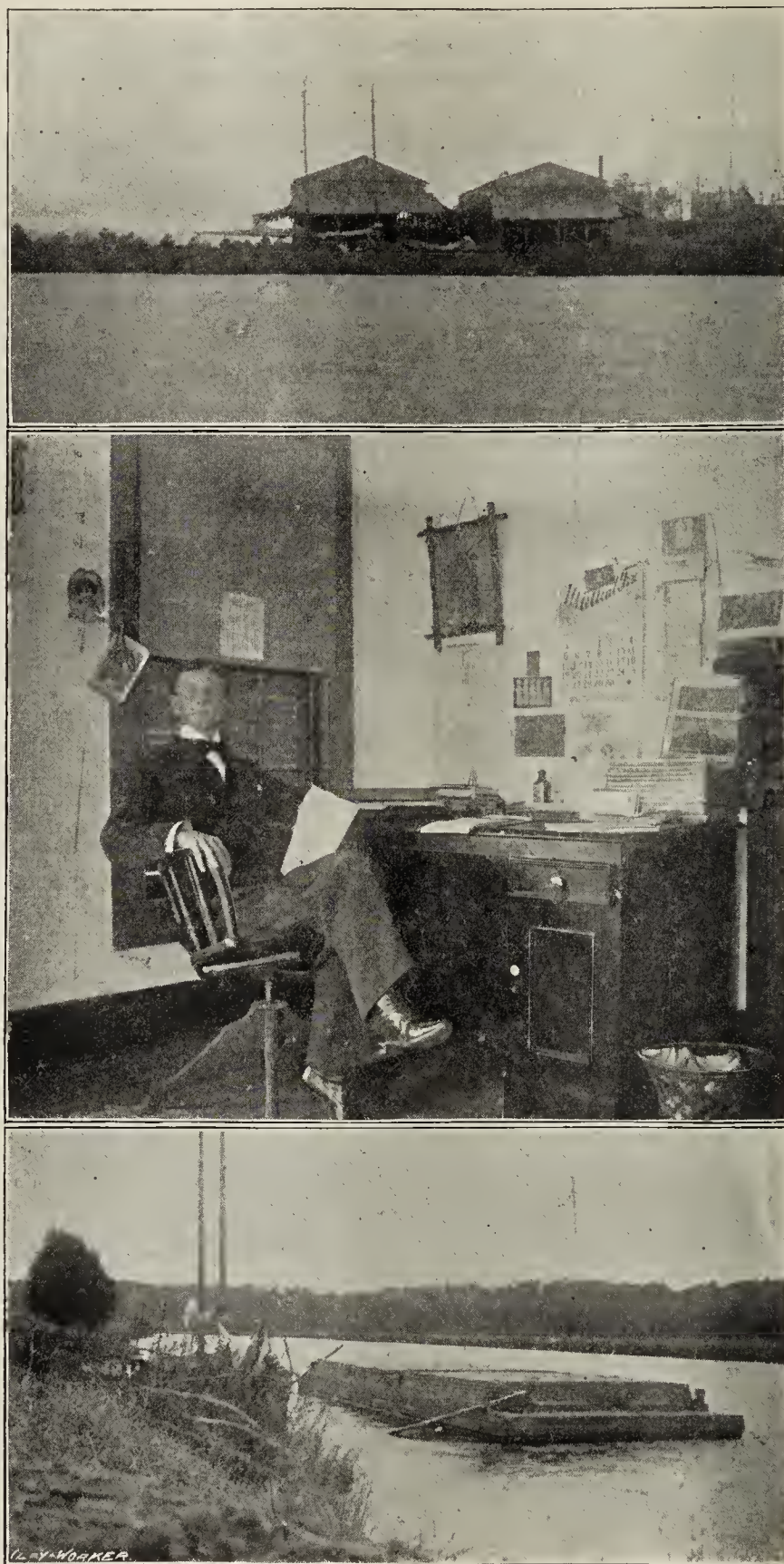
There are four acids which we commonly bring into our glazes. They are: nitric, carbonic, hydrochloric and sulphuric acids. The first two are quite easily expelled, the third somewhat more difficultly, and the fourth is the most tenacious of all. Our text-books say that when silica combines with the bases to form silicates, all these acids are driven off. But in practice, in the case of sulphuric acid, this process does not work so smoothly. For the decomposition of this acid we must have either a very high temperature or strongly reducing conditions. It has been proven by Pelouze that a glass may hold in solution as high as 3 per cent. of sulphate of soda. Such glass has a strong tendency to become clouded and to show a white or yellowish scum. On rubbing the surface this coating may be removed, but only to reappear in a very short time. This may be observed on many glazes. Another and much more unpleasant result of the presence of sulphates is the permanent dullness of the surface and the formation of blisters in the glaze. Glazes quite acid in character—that is, having an excess of silica—do not dissolve sulphates as readily as others containing less silica, and when heated a part of the sulphuric acid is expelled in bubbles, which give rise to blisters. Often, also, a sort of skin forms on the surface. This coating corresponds to the "gall" known to the glassmakers. Usually the layer of gall prevents the blisters from bursting and we find them distributed throughout the glaze.

Tracing the sulphuric to its origin we may find that it comes from one or all of four sources, viz.: the glaze ingredients, the body, the water or the fire gases.

The glaze ingredients always contain more or less sulphuric acid. Soda, potash, lead are hardly ever free from sulphates. And we even find many cases where lime, barium or the alkalis are specified as sulphates. That such glazes are liable to show all the defects due to the presence of the sulphuric acid is not at all surprising. In order to remove the acid from the glaze, reducing fire must be maintained periodically, but reduction must not be carried too far, or the metallic oxides, like lead oxide, will be reduced, and would give rise to black discolorations. If the lead is fritted previous to being incorporated into the glaze there will be less danger of blackening. Where colors are used they should be protected by the fused glaze before reducing gases are generated. In porcelain glazes, which are burned at a high temperature and with reducing flame, the sulphuric acid is entirely harmless, for it is com-

pletely destroyed and expelled. For this reason lime may be freely introduced as a sulphate.

The body, containing sulphates brought in by the clay, often is the cause of blistered glazes. It is much more difficult to expel the sulphuric acid from the body than from the glaze, and it is, in the low burning clays, hardly ever expelled before the point in vitrification. In brick clays the sulphates may exist even in the fused mass, if the fire gases are oxidizing. The water of the glaze absorbs more or less of the sul-



A FEW SNAP SHOTS, Page 506—Works from across the River.  
The Manager and his Cosy Corner. Barge loaded with  
70 M brick.

phates contained in the body, and thus brings them into the glaze composition. Where the ware is pressed in plaster molds sulphate of lime adheres to the surface.

The quality of the water used in making up the glazes should be considered in every case, and, if possible, rain water, should be taken, as it is entirely free from sulphates.

A most frequent source of sulphuric acid are the fire gases where coal is used as fuel. Most of the acid is introduced into the glaze through the water of condensation during the early stages of the burn. Whatever may be the source, all, or at



least part of the obnoxious compound, can be eliminated by reducing gases.

Although we have in a previous paper given some attention to the coloring oxides, there are other facts in regard to the subject of coloring which may be worth knowing. The common coloring oxides are as follows: Cobalt oxide for blue, nickel oxide for brown, copper oxide for green and blue, manganese dioxide for brown and black; iron oxide for brown, yellow or red; chrome oxide for green or red, and antimony for yellow. There are other oxides which are colorless or white, but by means of which different shades of color may be produced. These are: tin oxide zinc oxide, alumina and lime.

Although we know in general that the oxides named above produce such colors, yet there are many conditions which modify or intensify the coloring effect. Two important conditions are the melting point and the chemical composition of the glaze. That different temperatures produce different color effects is a fact which needs no demonstration. The chemical composition determines to a great extent the color to be produced. For instance, copper oxide produces a deep blue color in a pure alkaline silicate, while if part of the silica is replaced by boracic acid a greenish blue is obtained. If alumina is present the green is still more pronounced. Manganese oxide in a lead glaze produces reddish brown; in a barium glaze free from lead it gives a violet tint. Chromium oxide with iron produces brown; with cobalt oxide, nickel and manganese all shades of green, and together with tin oxide and lime a peculiar red. We see that thus the chemical composition of the glaze is of vital importance in regard to color. There are yet other conditions influencing coloration, such as the fineness of grinding and whether a color has been fritted before being introduced into the glaze.

If one wishes to obtain uniform colors it is essential to use ingredients which have a definite composition and never to depend upon compounds whose chemical composition is unknown. For instance, if ochre, chalk, clay or marl is specified the chances for variation in color are very great, simply because the substances themselves vary greatly in composition. Good kaolin, flint, whiting, etc., should be used and frequently controlled by chemical analysis.

Salts which on exposure to air either lose or gain water should not be used, owing to the changes of weight thus caused. The metallic oxides should be bought as nearly chemically pure as the price will allow.

We will close the topic of color with a brief discussion of the most important metallic oxides.

Cobalt oxide, used for blue, appears on the market in several forms, containing more or less impurities. All the cobalt preparations contain nickel in varying quantities, which give rise to greyish tints. Besides that, sulphates are usually found in cobalt, which must be removed by roasting and washing. Cobalt oxide alone gives rise to bloating, owing to the evolution of oxygen when the glaze melts. This can be avoided by combining the oxide with alumina. The pure cobalt oxide and the alumina-cobalt compound yield a deep blue. A light blue is obtained through an addition of zinc oxide, gray-blue with nickel, and blue-green with chromium oxide.

The color given by nickel is brown or brownish green, neither a very good color.

Copper oxide, producing green or blue, is suitable only for comparatively low fusing glazes. It has a great tendency to spread, owing to its powerful fluxing quality. Manganese oxide gives brown or violet, according to its contents of iron. It has some tendency to boil up, unless it is combined with alumina or phosphoric acid, or has been heated. Iron oxide is the source of many brown shades. With chromium it produces a brownish black, with cobalt a deep black, with alumina grayish brown, and with zinc oxide a reddish brown.

Chromium oxide plays an important role in the range of glaze colors. Alone it produces green with iron, brown,

and with tin oxide and lime, red. The red chromium colors are highly interesting. They are prepared by adding to a mixture of lime and tin oxide a small quantity of potassium chromate. An addition of silica results in a more red color, a decrease of lime gives a paler tint. The mixture must be highly heated. With nickel or manganese added to chromium, olive green or brown-green is obtained. Ferruginous impurities must be kept away, as they will tend to produce brown colorations.

All the chromium colors depend upon the temperature at which they are burnt, and the variations for varying temperatures may be quite great.

Antimony may be regarded as a yellow pigment only, if it has combined with lead oxide to form a basic salt. If the antimony dissolves in the glaze its coloring power disappears.

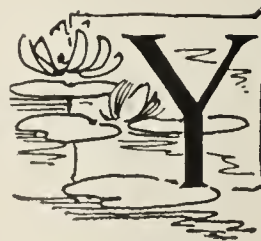
Alumina, though colorless in itself, is a very useful ingredient for rendering the colors more permanent, especially on underglaze work.

AMERICUS.



### A QUEER STORY.

BY WILLIAM HENRY GRADY.



YOU CAN HEAR the story from any of the old residents in the village. They will tell you of the time before the gloomy old house in the valley there was built. There was a smaller house than that, but a pleasanter house, sitting over on the hill where the thick wood stands now. That was where old man Blake lived. His brickyard was there in the valley, and the gloomy old house sits in the center of what was then the kiln ground.

The old house hasn't been occupied since old man Blake was found dead in his bed in the east room, and his daughter, Betty Blake, was found wandering in the woods, her reason blotted out, the day after they moved into the new house. It's a queer story.

Betty Blake was one of the handsomest and jolliest girls that the sun shone upon, the year before the house over there was built and before Blake shifted his brickyard further up the stream.

Blake had about twenty men at work that year, and business was the liveliest the valley here had ever known. There was in the crew a handsome young fellow, a stranger from somewhere back east. He had a peculiar accent, and the boys had lots of fun for a while trying to imitate him. But he was no fool. He had considerable education, and had a better understanding of the practical side of brickmaking than the men Blake had about him. It wasn't long before you could see old Blake kind of leaning toward the young fellow, and asking his advice now and then, and there were a good many changes in the way of making brick inaugurated after a few weeks.

Betty Blake used to help her mother in the housework, and they say she could do the work of three, and that besides doing the work she practiced her music and other studies that she had learned at the girls' school out in the city, and she just went around through the work and the duties there singing like a bird. It was just the most natural thing in the world that Betty and the stranger should fall in love, and they did. There was only one thing wrong, though, and that was a serious thing. It was simply that Betty was already engaged to a fellow from the next town who owned a brickyard and often came over to help Blake when he was short of burners. Folks



don't know exactly how it happened, but along towards fall the fellow came over to help burn a kiln. He and the stranger seemed to take to each other at first, and everything seemed pleasant. But in a day or two it could be seen that there was some sort of trouble in the air. Betty Blake wasn't singing as she used to sing, and the stranger was moping away by himself most of the time. Betty's fellow was looking blacker than a thunder cloud every night he came on to begin the watch. The kiln got to acting contrary, and it would insist on humping itself over and bulging out and threatening every minute to fall. The stranger had a way to burn by shifting fires each dressing so that the heat was more evenly distributed and so also the settling. Old Blake saw that the kiln was going wrong, and, having confidence in the stranger, insisted that the method of burning suggested by him be adopted.

One could see that that riled Betty's fellow, but he complied with old Blake's wishes, and held a few minutes' chat with the stranger in regard to the best way of beginning the change. Then they proposed to run the dressing.

"There's a bad place on that head there by the fifth arch," the stranger said, "and I put one prop against it, but I think it should have another. When I passed it awhile ago I could plainly hear the clinking of the brick falling down inside, showing that the head was moving outward. If the head should fall now it would make a bad mess."

"Oh, the heads are all right," said Betty's fellow, and he went over and seemed to inspect the prop put in by the stranger. "All ready!" he said then, and the men began to run the wood in. They had reached the fifth arch, and with the noise of the work and the haste to get the dressing in in good time the stranger was unmindful of the danger which he had spoken about. He had started a stick into the arch, and paused to peer in to see where it had settled, when, without a moment's warning, the head of the kiln collapsed, burying him in the red-hot mass. The men were quick to work. They tore away the brick from above him, but of course it was of no avail. The stranger was burned and bruised beyond recognition. They buried him in the cemetery over on the slope of the hill, and Betty Blake wept over the coffin as if her heart would break. Her fellow was there, but he didn't seem to have eyes for anything. He moped around like a man who walked in his sleep. They said that when the kiln fell that night he just threw up his hands and fainted dead away, and when he came to again one of the men heard him say, "What possessed me?"

Folks didn't think anything of it, though. It wasn't anything for a kiln wall to fall. But people soon learned that Betty Blake wasn't going to marry the man she was engaged to, and one day he suddenly sold out and went somewhere in the Northwest.

Old Blake moved his yard, and the old kiln ground made a beautiful site for a house, and he built there what was then the most imposing mansion, now a gloomy house, shut in by trees and tangled bushes. It was a grand residence, they say, but I heard it from those who heard it from the servants that the night they spent in it there was a continual sound like brick tinkling down inside of a kiln, and then there would come a distant crying with horror, and then there would come intense stillness, followed by awful moans.

Along about midnight the house was suddenly lit up, and Betty Blake was heard to shriek: "Oh, Robert, put back that prop! Robert! Robert! Can't you see that it will fall upon him?" Then there was a crash and the same distant cries.

The servants fled. Next day they found old Blake dead. The doctors said it was apoplexy.

They say if you go into the house at any hour of the day or night you'll hear the tinkling sound of settling brick, and now and then a mournful sound, as of many men crying far away. Nobody cares to go there, though.

It's a queer story. Most anyone in the village will tell you all about it.

## PAINTING BRICKWORK.

BY WILLIAM GILBERT IRWIN.

PAINTING BRICKWORK is a matter which has not been given any considerable attention. Just how much a good coat of paint adds to brickwork is not so widely known. However, it is not difficult to distinguish between the painted and unpainted brickwork, and it is not hard to see the improvement which the paint makes upon the brick.

Before applying the first coat to the brick care should be taken so as to clean the surface to be painted. The best priming coat for this work consists of glue size and venetian red mixed in the proportions of ten to one.

Oxide of iron paint mixed with boiled linseed oil also forms a good priming coat and a little dried can also be added to this.

In applying the priming coat care should be taken and it should be well brushed on. The paint should not be too thick when applied. As soon as the priming coat has thoroughly dried and all the joints and cracks have been puttied up the second coat can be applied. For the coats after the priming coat venetian red mixed with linseed oil and drier is used; considerable turpentine is also used, especially in the final coat.

The surface of painted brickwork is perfectly flat and to effect this but little oil must be used in the last coats. An excellent final coat for this work can be made by mixing brick dust with venetian red and ochre, using varnish and turpentine. In this no oil is used. It is the brick dust that gives the surface a natural appearance.

After the wall has been painted, attention must be given to the joints. These may be painted either in white or black. This is rather fine work. A straight edge and a seamer are used in this work. There are many things in painting the joints in brickwork which require more than ordinary precaution. In this work the horizontal joints are usually painted first, and then the vertical ones are easily filled in. It is a mistake to attempt to paint these joints directly upon the mortar joints. If this is attempted the result will be far from satisfactory. By painting just a little beneath the mortar joints far better results will be obtained. By doing this it will be possible to get a uniformity in the work and a satisfactory job will be the result. In some cases the joints are painted in oil colors and a glossy finish is the result, but this is not so much to be desired, especially with a dull surface like brickwork.

Oil must be used in the first coat of paint for brickwork, for it is the oil which forms the material which binds the pigments together. Certainly brickwork must be perfectly dry when the paint is applied, for otherwise it would soon scale off. If the proper precaution is observed in the work of painting this kind of work there will be little cause for complaint and the protection added to this kind of work by paint is almost as great as is the protection added to woodwork.—Painter's Magazine.

## A VOICE FROM TEXAS.

Editor Clay-Worker:

Enclosed please find \$2.00 for your esteemed journal another year. Our trade has been reasonably fair and the outlook for 1898 is fully as good, if not some better than last year. Our plant is equipped with a five-mold Lion press. We have a No. 2 fire clay, burns a light or cream color with dark spots. We also have potters' clay and common brick clay. Prices are from \$5 to \$8 per thousand. Our plant is located on two railroads and ship more than four-fifths of our brick.

ALBERT WIRZ,  
Manager Empire Press Brick Company.



## QUESTIONS ABOUT PAVING BRICK AND HOW TO LAY THEM.

Editor Clay-Worker:

I enclose herewith check for \$2.00 for copy of Clay-Worker for year ending December, 1898.

As you will see by the enclosed card I am interested in laying brick pavements, as well as making the brick, and would like answers to the following questions through the Clay-Worker:

Will re-pressed brick outwear plain brick if side cut?

Will re-pressed brick outwear plain brick if end cut?

What is considered the preferable size for paving brick and block?

Have the projection brick or block proven superior to other repressed brick or block?

Is there a practical and inexpensive method of spacing plain brick while setting them in street?

Will not the rough sides of side-cut brick hold cement grouting better than smooth re-pressed brick, even if latter are spaced, by projections on side?

All these questions have reference to red shale vitrified brick or block laid on a concrete base. The shale approximates closely the Canton Shale.

M. H. DALE.

### PROF. H. A. WHEELER'S VIEWS.

Editor Clay-Worker:

In answer to Mr. Dale's inquires as to the relative value of repressing end and side-cut brick, the work of Prof. Edward Orton, Jr., for the committee on paving brick tests, appointed by the National Brick Manufacturers' Association, has satisfactorily settled by tests what theory indicates, to-wit: that repressing is favorable to an end-cut brick, but unfavorable to side-cut brick. This arises from the vertical movement of the repress tending to further consolidate the more or less laminated structure of an end-cut brick, whereas it tends to open up the laminations on a side-cut brick—as in both cases the repress acts vertically on the flat side of the brick. The extent to which the end-cut brick will be improved, or the side-cut brick injured, by repressing after coming from the auger machine will vary with the plasticity of different clays with different degrees of tempering of a given clay, to the pressure applied by the repress, and to the difference in size between the unrepressed and repressed brick, as these factors will all have a marked influence on the results of repressing. It is, therefore impossible to predict the amount of benefit or injury that will arise from repressing, because of the great differences in clays, as well as in different conditions of a given clay and repress. In the particular clay (shale) used by Prof. Orton in his work, and under the conditions in which he made end-cut and side-cut brick, both pressed and unrepressed from the one clay, the result showed a loss of 18.2 per cent. for the repressed end-cut brick, and 21.1 per cent. for the unrepressed end-cut brick, after 1,000 revolutions in a standard rattler test, whereas the repress side-cut brick in a similar test showed a loss of 26.5 per cent., while the unrepressed side-cut brick showed only 22.7 per cent. loss.

But while Prof. Orton's tests demonstrate that the particular clay he used was benefited to the extent of over 15 per cent. by repressing the end-cut brick, and injured to the extent of over 16 per cent. by repressing the side-cut brick, these values only apply to this one clay as tested by his particular conditions, and these results can only be valued in a broad way as indicating approximately what may be expected with other conditions and different clays. Some clays and conditions would undoubtedly show greater differences and others less than obtained by Prof. Orton and the question ultimately resolves itself in this, as in most other clay problems, that each clay must be studied by itself.

As to which is the preferable size for paving, brick or block, will depend on the standpoint of the questioner. For while theoretically the large size or block makes fewer joints to wear and cause shock from faulty laying, the smaller or brick size

of paver is frequently seen laid with such care as to make quite as smooth a riding pavement as the larger size, as each size can be so laid as to make a smooth, easy-riding pavement, and both can be abused by careless laying. Practically the large size requires more time and is more difficult to dry and burn than the smaller size, and the seconds are very much less salable than when standard brick size, although the larger size is somewhat cheaper to lay per yard, from the lesser number that have to be handled. The block size are easier to set and give less trouble from rolling and crushing in burning than the smaller size, thereby materially reducing the percentage of culls, but carelessness in either too hasty drying or burning is felt more severely in the larger size.

The use of projections on the sides of brick or block is dying out, and their main value has been to enrich some shrewd operators who have taken out patents thereon. For they have not been found in practice to have any material advantage over smooth or plain designs, as the cement or tar filling in the joints has been found to have ample adhering surface in either



PROF. H. A. WHEELER, St. Louis.

case to fulfill its object whether repressed or unrepressed. For while theoretically the rough unrepressed brick will retain the filler better than a smooth repressed brick, and the projection devices to give a still better hold, the real object of the filler is to render the pavement solid and free from rolling or moving laterally. For the support of the brick for carrying the load must depend solely on the foundation beneath for retaining its surface, and if the foundation is defective no filler will ever hold the brick to surface. But the best foundations will not prevent rolling and side movement of the brick, and this has to be prevented by closing up the joint completely, with sand, tar or cement to make a solid pavement. If a cement grout or hot tar filler is used, the brick cannot be set too tight or laid too close, as the natural roughness and warpings of the brick or block will leave large enough joints for these fillers to penetrate and fill them. But if a sand filler is employed, which is the cheapest kind, it works very slowly into the joints, unless they are opened up by either projections on the brick, or else by inserting thin slips of wood in laying, as in spacing rails in railroad practice.

H. A. WHEELER.



Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 3.

Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

John and William Ridgway.



AN IMPORTANT POTTERY was established about 1794 at Hanley, Staffordshire, England, by John Ridgway. His two sons, John and William, were admitted to partnership in the business early in the present century, under the style of Ridgway & Sons, and at the death of the father, in 1814, the firm became J. & W. Ridgway. About the same time the brothers became interested in another manufactory, at Shelton. Job Ridgway, in 1802, had built a portion of the present establishment, known as the Caudon Place Works, now operated by Messrs. T. C. Brown-Westhead, Moore & Co. Here the Ridgways made ware for the home and United States markets. They issued a series of dark-blue designs on the various pieces of table services, which they called "Beauties of America." So far as we know



Insane Hospital, Boston.

the Ridgway brothers conjointly produced no other ceramic views relating to America.

LIST OF AMERICAN DESIGNS PRODUCED BY J. & W. RIDGWAY.

—"Beauties of America Series."

Designs in dark blue. Border, rose leaf medallions.  
 Boston, Alms House.  
 Boston, Athenaeum.  
 Boston, Court House.  
 Boston, Insane Hospital.  
 Boston, Octagon Church.  
 Boston, State House.  
 Charleston, Exchange.  
 Hartford, Deaf and Dumb Asylum.  
 Mount Vernon, near Washington.  
 New York, Alms House.  
 New York, City Hall.  
 Philadelphia, Library.  
 Philadelphia, Pennsylvania Hospital.  
 Philadelphia, Staughton's Church.  
 Savannah, Bank.  
 Washington, Capitol.

JOHN RIDGWAY.

In 1830 a dissolution of partnership occurred, and the two brothers began manufacturing independently, when the pro-



Deaf and Dumb Asylum, Hartford.

duction of the "Beauties of America" designs seems to have been discontinued.

John Ridgway, the elder son of Job and Elizabeth Ridgway, was born at Hanley on Feb. 1, 1786. After the separation he continued to carry on the Caudon Place business, with various partners, until the year 1858, when he retired, and soon after on December 3, 1860, he died. He was a progressive and skillful potter, and his wares became widely known for their excellence. In 1851 he received a prize medal for the superiority of his productions, and he received the high honor of being appointed potter to the Queen. He occupied various positions of trust during his lifetime, having been the first mayor of his native town, and, subsequently, magistrate for the county and borough, and a deputy lieutenant of Staffordshire. He always stood high in the community, and commanded the respect of all who knew him. He was prominent in religious circles, and



Staughton's Church, Philadelphia.

for a long period taught a class in the Sunday-school, numbering among his pupils many who afterward became prominent potters, among others, Charles Cartlidge, the founder of the porcelain works at Greenpoint, N. Y.

John Ridgway seems to have produced but few historical designs especially intended for the American trade, the best



known being the Log Cabin or "Columbian Star" view, issued during the presidential campaign of 1840. This was printed in a number of colors, and three distinct varieties are known. One of the original copper plates engraved with this design, from which the transfer impressions were printed, is owned by the writer. I am informed by the present proprietors of the Cauldon Place works that the first consignment of this pattern was sent to Mr. Henry Winkley, of New York city, the scale price being three shillings, six pence, or about seven cents each per piece.

LIST OF AMERICAN DESIGNS PRODUCED BY JOHN RIDGWAY.

Designs in light blue, black, brown, red, etc. Border, large stars in a firmament of small ones.

—"Columbian Star, Oct. 28, 1840" (Engraved by Thomas Hordley.)—

1. Log Cabin, end view; two men.
2. Log Cabin, side view.



JOHN RIDGWAY.

3. Log Cabin; horses and plow.
- Design in dark blue.

—Capitol, Washington (High Steps and Balustrade, Monument Surmounted by Eagle at Top.)—

This latter design has recently been revived by Messrs T. C. Brown-Westhead, Moore & Co. for a New York firm.

WILLIAM RIDGWAY.

The younger son of Job and Elizabeth Ridgway, William, was born May 25, 1787. After leaving his father he turned his attention almost entirely to the United States market, and established agencies in this country for the sale of his goods. In 1843 he was interested in six different manufactories in Staffordshire. One of these, the Bedford works at Stoke-on-Trent, is now operated by his grandsons, and to one of these, Mr. E. A. Ridgway, I am indebted for the portraits of the Ridgway Bros., which are here reproduced. This well-known firm still continues to use some of the copper-plate designs which were originated by William Ridgway, a "flow" blue Oriental pattern being supplied to several houses in this country for present sale.

William Ridgway came to the United States, where he spent considerable time in travel. He at one time contemplated the establishment of a large pottery here, and pushed his plans to



Log Cabin; Design No. 1.

the point of selecting a location in Kentucky and commencing the erection of buildings. Unfortunate investments, however, upset these plans, and he returned to England, where he died on March 29, 1864.

A dinner service, ornamented with American scenery, was issued by William Ridgway about 1843.

LIST OF AMERICAN DESIGNS PRODUCED BY WILLIAM RIDGWAY & CO.

Designs either in black or light blue, the latter with narrow border.



Log Cabin; Design No. 3.

Caldwell, Lake George.

Columbia Bridge on the Susquehanna.

(From engraving of W. H. Bartlett, published in London by George Virtue, No. 26 Ivy Lane, 1838.)



Delaware Water Gap, Pa.  
Harper's Ferry from the Potomac Side.

Narrows from Fort Hamilton, The Peekskill Landing, Hudson River Port Putnam, Hudson River, View from Ruggles House, Newburgh, Hudson River, View from Shenandoah from Jefferson's Rock, Valley of the Washington, View of the Capitol at Wilkes Barre, Vale of Wyoming.

Written for the CLAY-WORKER.

### HINTS ON BRICKMAKING.

BY R. B. MORRISON.



AS SOON AS THE DAILY OUTPUT desired is determined, the question of power comes up. It goes without saying that the engine selected should be first-class. Nothing about the plant is of more importance; the output is dependent upon the steady and unfailing supply of power. When the engine stops all machinery stops, and that means the steam is shut off at the fountain. Some stops and lost time is unavoidable at the brick machine or some of the auxiliary machinery, but this is not necessarily true of the engine. With a good modern engine and a competent, careful engineer there is no probability of delay. Only those with experience can understand the vexation of spirit, or worse, caused by repeated stops on account of a hot box or packing blowing out, when there is pressing demand for brick.

Some think a second-hand engine and boiler, or even a second-hand machine, is cheapest. There is only one contingency that justifies buying this kind of machinery, however cheap you may be able to get it. If you intend to make brick but one season and then abandon or sell your outfit; then it may be economy. If you intend to put up a permanent plant, get everything new and the best the market affords. When you buy old machinery you are simply possessing yourself of



Capitol at Washington. See Page 512.

some other fellow's troubles and tribulations. Should you go into the brick manufacturing business you will have troubles enough, without paying for them. They just naturally "hatch" on a brick plant; hence it is unnecessary to buy them.

#### THE HORSE POWER REQUIRED FOR A GIVEN OUTPUT.

For a daily output of 25,000 to 30,000 brick I would advise

fifty horse power, and for 50,000 to 60,000 per day, 100 horse power. This amount of power is more than is needed to run the brick machine. In most modern plants steam is used for hoisting clay while on car, after being loaded at the mine, to a point above hopper of machine, or disintegrator or crusher or dry pan. This may be done by a winding drum—with cable



Columbia Bridge on Susquehanna. See Page 512.

—driven from the line shaft or by an independent hoisting engine. The advantage of the latter is it can be operated while the engine is idle. Again, all clay preparing machinery must be driven by the engine and with power in above proportion to output. All this can be done without undue strain upon the engine. This will preserve it.

The boiler power should be as great, if not greater, than the engine, as you may wish to run some independent machinery or use steam from boiler for heating dryer. Boilers are the source of danger. For this reason alone they should not only be first-class in quality and make, but should be large enough to protect them from too great pressure. And here again the services of a capable, reliable engineer is needed to care properly for them, and in this way protect the lives of your employes, as well as protecting your property. We hear of explosions in saw mills and drain tile works, and occasionally at a brick plant. As I have written some articles in the past on boiler explosions and the cause, I will not discuss this question at length, but will say that I believe all explosions are the result of carelessness or ignorance on the part of those having them in charge, and that ninety per cent. are caused by low water, which is the result of either ignorance or gross carelessness.

The usefulness of an engine depends largely upon being properly placed on a good foundation. Here we often err, taking too little time in setting our engine and boiler. Lay the foundation deep and broad and have the engine plumb, square and level, and every shaft in perfect line. The same holds good in setting machinery of any kind. This must be done to insure quiet, easy movement of all parts. Never put timbers of any kind in the ground as a foundation for machinery of any kind. It is but a short time until it begins to decay and allows machine to settle out of line, then an unnecessary strain is put upon the machinery, and every day it runs the strain is greater. By all means put brick and lime or cement under everything, then in ten years the foundation remains just as you left it. Brickmakers use too much lumber and it is more expensive in the end.

Protect all machinery by enclosing it in a house with a water-tight roof, and always provide good light in the engine room, using skylights if necessary. A dark room for an en-



gine, or machinery of any kind, should be avoided. It is hard to keep machinery in proper order when in dark room.

Put up a brick smoke stack at the start. If you begin with an iron stack it will be worthless in five years. The cost of two iron stacks will build a good brick stack that will last a hundred years. In putting up a brick stack begin at the point where smoke enters from boiler furnaces, and line with four inch wall of fire brick, and leave a space of two inches behind this four-inch lining. This should be independent of the main wall of stack, except at corner let a brick span the opening from main wall, and touch this lining, another at the diagonal opposite corner, this to steady the lining, and leave it free to expand. This lining and air space should go up about 30 feet, then it can be run solid to top. There must be inlets to this chamber at bottom to admit air, and other outlets at top to allow heated air to escape. This causes a current of air to pass upward through this air chamber, and escape at the upper outlets. This prevents main wall of stack from cracking with expansion, which is the greatest danger to a brick stack. This stack is not only permanent in its character, but fire proof, being satisfactory to insurance inspectors and nothing adds more to the general appearance of permanence of a plant than does a well proportioned brick stack. Build it high enough to insure good draft. In determining height the nature of the surroundings must be considered. If there are tall structures near it is necessary to build a stack higher. Fifty feet under favorable conditions gives good draft; other conditions might require 60 or even 75 feet altitude to give like results. It is not best to finish a stack with heavy coping. A light coping gives it a more symmetrical appearance and it is also more durable. Brick stacks for brick plants and brick buildings for brick-makers.

Written for the CLAY-WORKER.

#### A BRICK FACTORY IN A WOODEN TOWN.—No. 3.

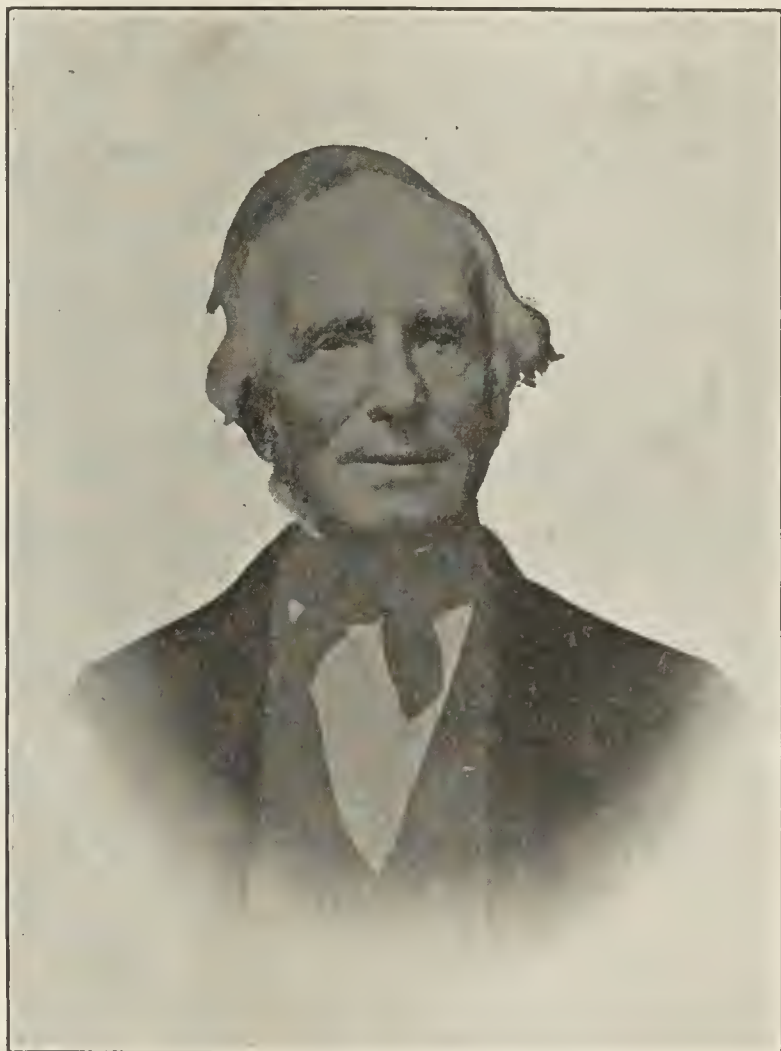
BY L. C. M.



WE RECEIVED a great deal of gratuitous advice from heads wise and otherwise as to the how and wherefore of our business. We were told by old brick-makers of twenty-five to forty years' experience, that the clay from our bank had been tried by brickmakers way

back in the past, and found to be a failure. But our machinery and sheds had already been put up on this land, and we were bound to give it a trial. I will pass over a great deal of the vexations and general troubles that followed the attempt of novices to run machinery. We finally got our sheds filled with green brick—hacked in rows eight brick high. Our clay seemed determined to act as badly as had been prophesied concerning it by various old brickmakers in our town. For the first breath of wind that struck the brick filled them full of checks and cracks, and against they were dry enough to go to the kiln, almost one-half of them were broken in two pieces. This was a period to try our nerves. If our clay proved a failure a new site would have to be selected and our plant moved to it. And here it was the last of May, and no prospect of brick to meet the demand which is sure to come when you have nothing to sell. Still we persevered, trying all sorts of mixtures of clay—hauling some from a distance—yet always the same result, viz.: one-half of our product went over the dump. We even tried some of the best clay in our community for hand-mold brick, but found after it had undergone the pressure and polishing of our end-cut die the brick cracked as badly as those from our own clay bank. But at last we got enough dry whole brick to set a kiln of about 100 M. We had no permanent kiln, but set the brick with a board roof over them and "cased" up with bats, of which we had plenty, and got ready to fire. We secured the services of two ancient graduates of the craft who knew all about "water smoking," "head firing," "settling," etc., one to take the day "shift," the other the night. The fires were started and the water-

smoking proceeded very carefully, and finally they began to raise heat. Oh the wood they poured into the arches of that kiln. The fires were kept roaring and the black smoke kept rolling from the tops of the kiln. They fired one side hard, while the other side was kept sealed—and then turned and commenced on the other side. The brick were set 33 high, and our experts thought we ought to have a settle of 12 inches. And so the fires were kept at an intense heat, until there was rather a sudden drop in the center of the kiln. After 24 hours vain attempt to get the outside and corners to settle, it was decided the kiln was "done," and the furnace doors were closed and sealed and the kiln allowed to cool. At last we would have brick to sell. We took pains to advertise that fact, as well as to claim our product to be a very superior article. To be sure, we had not been able to see our finished product, but when one took into consideration what they had cost, they surely ought to be good. It would be hard to describe our disappointment upon opening that kiln. Where the burners had secured a "settle" the brick were melted and run together until it was necessary to use a crow-



WILLIAM RIDGWAY. See Page 512.

bar to separate them. The rest of the brick were too soft, with a spot here and there of very good brick. "I told you so." was what we heard from all sides. "Your clay is no good." "Machine brick are a failure anyhow." "You had better throw away your machines and go back to the good old hand method."

All this may have been good advice, but we heeded none of it. We were determined to make another effort, and see if we could not do better the next time.

Summary of the result of the first kiln:

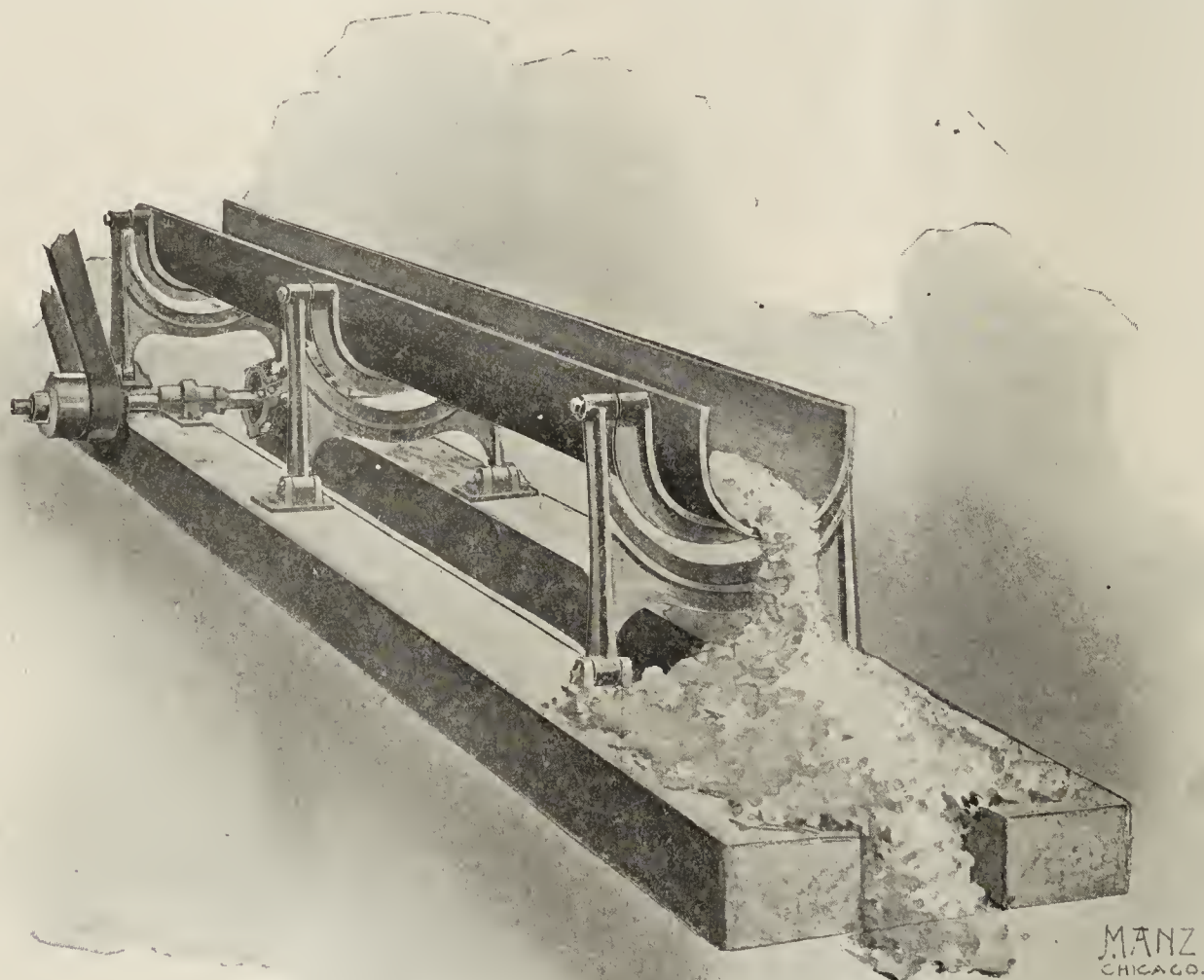
|                                                    |              |
|----------------------------------------------------|--------------|
| 200,000 brick manufactured, cost \$1.50 per M..... | \$300        |
| 75 cords wood, at \$2 per cord.....                | 150          |
| 100 M brick set in kiln at 50c per M.....          | 50           |
| Casing kiln.....                                   | 25           |
| Labor for burning.....                             | 25           |
| <b>Total cost of kiln.....</b>                     | <b>\$550</b> |
| Sold 500 M brick at \$5.....                       | \$250        |
| <b>Loss on first kiln.....</b>                     | <b>\$300</b> |



## THE CHALLENGE CONVEYOR.

A NEW AND NOVEL CLAY CONVEYOR is now offered the trade by the Simpson Machinery Co., Chicago. The accompanying illustration will give the reader a good idea of its construction. Simplicity is its chief characteristic—a very desirable feature in any clayworking machine or device. It is aptly named the Challenge Conveyor. The inventor, Mr. P. L. Simpson, says it is unequalled in capacity and ease of operation. Mr. D. V. Purington, of Chicago, speaking of the one they have been using at his paving brick plant at Galesburg, says: "It seems to be the nearest perfection of anything we have ever used as a conveyor."

The conveyor has a peculiar motion by which it carries material along rapidly, giving great capacity. It never clogs or chokes up. The more material there is fed or shoveled into the trough the faster it is conveyed along. The Challenge Conveyor is destined to fill a long felt want in many plants.



The Simpson Challenge Clay Conveyor.

Those having trouble with old-style conveyors should investigate the merits of this new device. For full particulars address the Simpson Machinery Co., whose ad. appears on page 489.

## FAILED TO CONVERT CLAY INTO GOLD.

E. C. Brice, who startled Chicago a little less than a year ago by claiming to have discovered the alchemist's secret of converting clay into gold, has left that city temporarily, and is said to be suffering from nervous prostration. He has given up his wild dreams, and now acknowledges that his scheme is a failure. The plant at Thirty-ninth street and Lowe avenue, which was erected at a cost of \$20,000, has been closed down, and P. G. Lamaroux placed in charge. The latter says every dollar Mr. Brice has received has been spent in experiments. Last winter some of the stock sold for \$250 a share. The shareholders number 300. Mr. Lamaroux is still confident that Mr. Brice will eventually be able to do just what he has claimed he could.

## MAKING MARBLES.

—A New Clay Industry Established at Canton, Ohio.—

MANY ARE THE FUN-LOVING LADS in this city who hover about the plant of the Canton Clay Insulator Works, and look with longing eyes at the barrels of marbles, big and little, that stand about the large kilns in enticing confusion. There are few people in Canton who know anything about this industry, which has no little prominence throughout the United States. It was started only a few months ago by a few of Canton's capitalists, and is now just getting under the way of manufacturing its articles without the usual hindrance known to newly-born industries.

—Plenty of Room.—

It is a fact that only three-fifteenths of the marbles used in the entire United States are made in this country. The rest are mostly shipped from Germany. It can readily be seen that there is an excellent field for the Canton company.

In the Canton Clay Insulator Works, that city is the posses-

sor of one of four institutions in the United States that manufacture marbles. It is near some of the most famous clay beds in the United States, and its plant is far larger and better equipped than the ordinary ones. It has a capacity of two hundred thousand marbles a day, and in a short space of time its facilities could be so increased that ten times that number could be made every twenty-four hours. Walking down the broad driveways in its warehouse one sees millions of little round balls heaped up in great bins that in boyhood seemed dearer than so much gold. Fond pictures of earlier years loom up before you, when even rainy days could not keep you from the village green, where hundreds of other lads were sure to be playing at "keeps."

—How Marbles Are Made.—

Something of how marbles are made might be of interest. The clay material first appears like so much flour. There are



two different kinds used, which are mixed together and tempered with water. Before the mixture becomes entirely hard it is run through a large machine made especially for the purpose, and comes out in tubular-like strings about two feet long, which vary in diameter from a quarter of an inch to two inches. These tubes are then cut into sizes which correspond to their diameter, and conveyed to the moulding room, where a large number of girls and women are employed in rolling them into their proper shapes. This room is where the most interesting work is performed. The girls sit at long tables with the moulds before them. These moulds consist of nothing more than two oblong boards with grooves made the proper size in them. A girl snatches up a handful of the soft material, and, quick as a wink, places a single piece of the clay in each groove of one of the boards, she then takes up the other board, places it on the top of the one which contains the pieces of clay and rubs them together very swiftly for a moment, which makes them the proper shape. She then lays them upon a shelf at her back, preparatory to their removal to the kilns for baking.

—How the Marbles Are Burned.—

The Canton Company has three kilns, but only one of them is in use. The marbles are placed in a large oven-like affair,

manufactured somewhat after the same plan that the marbles are made, with the exception of the moulding.

FROM THE ASHES.

The Fort Dodge Brick and Tile Company's Plant.

Dear Clay-Worker:

In March it was our misfortune to be visited by the fire fiend, and while his stay was brief we must say he made it exceedingly warm for us while here. He arrived at midnight, a very unseemly hour for an unbidden guest, and when old Sol again looked on the scene our plant was a pretty bad wreck. All of the buildings, including engine and machine house and dry sheds were burned. The machinery, including a Boyd dry press, Decatur Leader brick and tile machine, clay crushers, cutting tables, etc., were all damaged more or less, but not so bad as to be beyond repair. We at once set about rebuilding, and now in less than 90 days are again in pretty good running order.

Our clay bank is but a short distance from the machine house, so we dig it by hand and haul in barrows. While we



Works of the Ft. Dodge (Iowa) Brick and Tile Co. From a Photo taken before the Fire.

and left there until they are thoroughly baked. Just how long it takes to perform this part of the manufacture of marbles cannot be exactly estimated. The only way that workmen are able to tell when the clay has been baked hard is to pull out a number of the little round balls by means of prongs or hooks made for the purpose, and examine them.

After the clay is thoroughly baked and cooled, they are taken out, removed to the coloring department, and there girls, employed for the purpose, put on the coloring preparation designed to tickle the optic nerves of the millions of boys throughout the country, and to make their pennies burn holes in their pockets. After coloring they are counted and placed in bags which are made to hold just an even thousand, then placed aboard the cars and shipped all over the country.

—Large Orders.—

Manager William Labbe said to the reporter who visited the works that they had received orders that varied in amounts from ten cases to a carload. Since their organization they have done little advertising, and no soliciting by means of traveling salesmen, but have conducted their business purely upon the merits of their product. They not only make marbles but clay insulators for electric wiring purposes, which are

make common building brick principally, we also turn out a line of buff pressed brick that we think are unequalled in this part of the country. They are made on the Boyd press and are hard to beat. We also make a line of sidewalk tile that we are very proud of. They are 8x8 blocks, and are used almost exclusively now in our city. Will make a few hollow blocks the coming season, and some pavers, too.

With these side lines in addition to our average daily output of 25,000 to 30,000 common brick, we manage to keep pretty busy and hope for a good season, free from fires, cyclones and floods.

Wishing the Clay-Worker continued prosperity, we are

Very truly,

FT. DODGE BRICK TILE CO.

BRICK YARD PROPERTY BRINGS A BIG PRICE.

One of the largest deals of the year in Philadelphia, says the the Ledger, has just been concluded. W. T. B. Roberts has purchased the McAvoy brickyard property, comprising about 275 acres and situated in the Thirty-sixth ward, for \$1,000,000. It is understood the land will be utilized by the Union Traction Company for car barns.



Written for the CLAY-WORKER.

### THE NEW YORK MARKET.



JUST AT PRESENT the New York market is as fine as silk. Nothing the matter with it. Supply and demand is nicely adjusted, without any combination among manufacturers or agents. There probably has never been the same condition prevailing at this season of the year, the first of June, since the New York market has been in existence. The old but familiar cry that has been heard year after year from the seller to the shipper "to hold back" is not heard at present, simply because the shipper has no old or new stock to send, on the majority of the yards. The last week in May quite a few new brick were shipped. Probably there has been no season previous that new brick has been so long getting on the market after the yards had started molding and with the inducement to ship that has ruled this season so far. The unseen Power that rules the universe has been the factor. In a nutshell, if good weather had been in order—well, the rates would have ruled low. With all the shortage, within the month brick were shipped freely, with the result of a fall in price.

The following comparison will show what a thin shell the

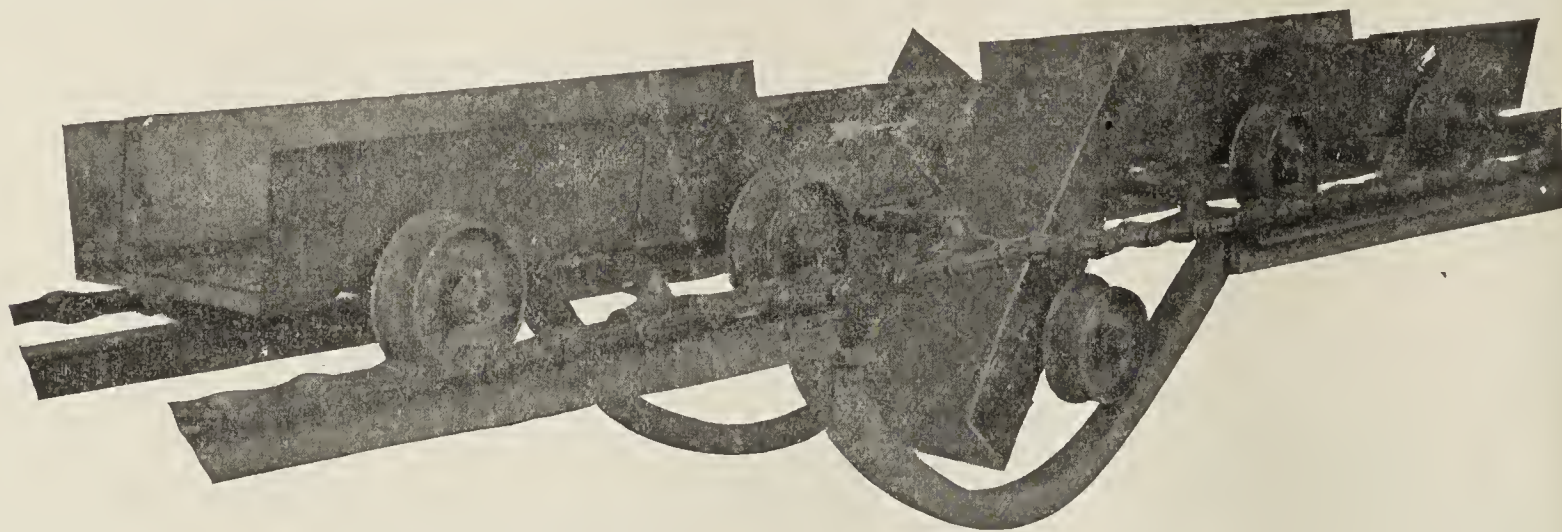
tory gained by the New York Stone Trade Association will, it is to be hoped, result in a beneficial effect in all lines of trade. The bosses locked out the men just as soon as they struck. The result is that the great "I am," the walking delegate, is abolished. Arbitration is established, and sympathetic strikes are abolished. In the face of such a setback in one line of trade, the Portable Hoisting Engineers' Union has struck to enforce a demand of advance of wages from \$4 to \$5 per day. To help along the Plasterers' Union has struck in sympathy, and the bosses have informed them that they must abandon the board of walking delegates or be locked out. With continual striking in the building trade stopped, the brick trade will soon look up.

—Outlook, 1898.—

The number of new plans filed is where the demand for the brick trade has to look to take the stock. From January 1, 1897, to May 31, there were plans for 1,710 new buildings; same length of time, 1898, 1,277, or 433 less this year in New York city. Brooklyn, in same date, 1897, 1,403; in the present year, 1,218—185 less than last year; in the two cities, 618 plans less than 1897 goes to show why 24 barges in a week meets the supply.

—Clay Slides—

In Haverstraw this season are frequent. On Fowler & Son the slide was of such a nature that the services of a spile driver had to be called to drive spiles to prevent the residence of Mr. Fowler from going down. Nobody's property was injured but their own. About the middle of May Mr. J. W. Gillies' clay bank in the north part of town slid over on his neighbors on



The Jeffrey Endless Open Pan Conveyor.

market has at present: 1898, May 28, pale, \$3.50 and \$3.75; New Jersey, \$6.25 and \$6.50; Hudson River, \$6 and \$6.50, with 24 barges arrived in one day.

May 29, 1897, shows 54 barges arrived and 63 sold, with good demand. Pale, \$1.50 and \$2; hard, \$4.25 and \$4.75, with a few sales at \$4.87½.

If the weather now prevailing lasts for a few days, before this appears in the Clay-Worker, \$6.50 will be a rate of the past, as 24 or a few more barges could supply the demand. What will the result be when 50 or 60 or more per week will reach the market, and all that is wanted to do that caper is good weather?

—New Brick—

Are reaching the market very slowly. Some of the yards have not burned their first kiln, one just out, another just setting fire. If the brickmakers all over this great land have had as much rainfall as this locality, they will think that between low rates and washed and spoiled brick the end will soon be here. With but six days molding in a month, and have the brick washed and some so badly that they were thrown away, with the expense of the removal from the yard, is discouraging. During the week ending May 28 there was not a machine run, as it rained each day or night. As reported in last number, the strike was rather early in the season, as it rained for three days after, and the yard could not run if it wanted to. When they did mold, the men were ready to take hold and say nothing about an advance. One of the strikers was sentenced to serve the State for some months.

One of the yards had molded three pits when the men went out. The boss shut down the yard. After laying still about a month he took new courage and started once more, for how long now doubt the price of brick will control.

—One of the Factors—

That was supposed to have kept back the demand for brick this spring was the strike in the cut-stone trade, and the vic-

the north. Two or three years ago there was a slide on the same property, but not so large as this. From that time to this Mr. Gillies has been trying to effect a settlement with the owner of said property, but without success; now he has another cause.

A. N. OLDTIMER.

Hackensack, N. J., 6-4-'98.

### ENDLESS OPEN PAN CONVEYOR.

THE ECONOMICAL handling of material, such as shale, clay, coal, ores, broken stone, gravel, sand, etc., is one of general interest in the industrial fields, and while there are many methods employed, the Jeffrey Endless Carrier System, illustrated herewith, is one that possesses special points of merit. It is made up of a series of steel pans arranged with carrier wheels and of a type to interlap when fastened to the chains which run along parallel with the pans, and to which the pans are secured by means of a stationary shaft to the special ear attachments in the chain. The one feature in this type of pan conveyor that makes it more desirable than other forms is the dumping or discharge arrangement. In most pan conveyors, the material can only be discharged at the terminals. With this conveyor, however, the load may be discharged at any point along the run-way by the introduction of the tripping device shown. Usually this style of conveyor operates upon angle iron run-ways, although other constructions are permissible. In the illustration herewith, the one shows the run-way intact, the other open, which is done by simply withdrawing the hinged iron track or gate, as shown in the second cut.

In operation, these truck pans follow the curvature of the track, and in the open position discharge their load automatically and again take up their position in the endless trough



on the run-way. It is actuated by sprocket wheels, located at the terminals, engaging with the chains along the side of the pans, while the truck wheels are guided around the terminals by following a curved iron run-way, which keeps them in position upon leaving and entering the roadway. But little power is required to drive the conveyor, as both the loaded and return sections are carried upon the truck wheels, which have special oiling devices, and thus the amount of power is reduced to a minimum. This carrier system is applicable in many industries, and, as it is built to suit the requirements, interested parties can secure further data by addressing the manufacturers, The Jeffrey Manufacturing Company, Columbus, Ohio, or at any of its branch offices.

Written for the CLAY-WORKER.

### THE USE AND ABUSE OF CLAYWORKING MACHINERY. Fourth Paper.

BY A MASTER MECHANIC.



IN THE THIRD PAPER of this series, we enumerated and described the various mechanical devices for loosening the digging the clay and to some extent followed it to its transporting medium. We will now proceed to consider the merits of the means used for that purpose.

In many instances it becomes a serious consideration, how best to convey the clay material from its source to the factory, with the least cost possible. To do this we will enumerate the various vehicles of the mechanical art for that purpose, and then to proceed to describe them singly, as to construction and adaptability.

First. We have the side, end and bottom dump cars.

Second. The simple tramway car.

Third. The endless apron carrier.

Fourth. The overhead carrier and dump with its modifications. Dumping carts and wagons propelled by animal power need no description and comment in this connection, inasmuch as these are so well known and in general use. However, we will state that in many places these are the best and the cheapest conveyances that can be adopted.

The first three modifications of dumping cars, running on tracks, are usually adopted where the clay pits are comparatively distantly located. The propelling power may be by ropes or chains from a winding drum. This being an important item, will be treated at some length, after we describe the various styles of dump cars. Locomotives of three different kinds will also come in more extensive use in the future for propelling cars back and forth, for longer distances than for which ropes and winding drums are adopted, namely, the steam locomotive, the electric motor and the gasoline or oil engine motor.

To resume the subject of the dump cars, we remark that the side dump car is most convenient, when the clay storage or dumping place is to one side of the track, or the reducing machinery into which it has to be dumped is so placed that that mode of unloading proves the best for the locality. The construction of the side dump cars differ from the bottom and end dump, usually in being made in two distinct parts. The truck and oscillating box, which holds the clay. This box is either made to swing between two supports (fixed on the truck) on pivots, or is provided with cogged sectors in under. These fit on cogged racks which rest transversely on the truck frame. With this construction a rolling movement is secured, which always brings the box over to the dumping side from the center, where it is carried during transportation. This enables the material to be thrown further from the track than can be done with a center pivoted arrangement. It should be mentioned also, that a square-cornered box can be used for the rolling dump box, while the pivoted box must necessarily be hopper shaped. The rolling dump box has one or both sides hinged, with quick releasing fastenings. This enables it to hold a larger load than when made hopper shaped with the sides fixed. This latter is used very largely in Europe, while we Americans have adopted the other kind for its many advantages. The same argument pertains to the end-dump cars also. These, however, have special modifications. Those made for end dump and coal tipples when emptying have the track sharply depressed on the end, so that the bottom of the car

assumes the proper incline for discharging when the end gate is released. Another class of cars are made short with the axles close together, so that the front axle acts as a pivot upon which the cars turn over far enough to discharge the material over the fixed end of the box. In either case, the track rails must be upwards at the ends, so that they act as a stop for the wheels to rest against while the car tips over, so as to prevent accidents. Sometimes separate stops are provided, which catch the hubs of the wheels, made longer than common for that purpose.

The bottom-dump cars are used when the clay is to be dumped between the tracks straight down. In this construction the sides of the box are made permanent. For sticky clays the box is made wider below, to keep the clay from hanging fast when the bottom is released. The bottom is made in two parts, lengthwise to the car, and both parts are hinged onto the sides, so that when released they hang down straight, leaving the box entire open below, through which the clay drops. To the center of each hinged bottom piece near the edges where they meet are attached two chains, which are fastened above on bell cranks keyed to a transverse shaft on the top of the box. On the end of the transverse shaft is a lever or crank piece, by which the shaft is partly rotated when the bottom is to be drawn back to its place. When shut securely the lever engages a latch, which locks it. When dumping this latch is released by hand or automatically by a stop piece on the side of the track, so that the car dumps its load always where required. If several dumping places are required, different stops, which can be raised or depressed at will, enable the dumping to be done at different points. Another attachment for automatic action is a simple sliding bar, reaching from the stopping place of the car to the lever of the winding drum, placed directly in range with the track. When the car reaches this sliding bar it bumps against its end and pushes it forward far enough to disengage the friction or clutch of the winding drum. This stops the car for a moment, during which time it drops its load and commences its return journey down the inclined track. It is gratifying to the writer that this device of car and automatic action has come into general use, inasmuch as he designed the first and gave it to the public without a patent. In our next we will take up the other two items mentioned above.

(To be continued.)

### TOO GENEROUS BY FAR.

#### Paving Brick Manufacturers Lose by Voluntarily Raising the Standard of Rattler Test.

According to the reports in the local papers the Harris Paving Brick Co., that has furnished nearly all the pavers for Grand Rapids, Mich., has suffered severe loss by over estimating the crushing strength of their pavers.

Heretofore the company has guaranteed its brick to stand the rattler test and not lose more than twenty-five per cent. of their weight. All the brick pavement now laid in Grand Rapids was put down with brick under this guarantee and has been satisfactory.

A short time ago the company voluntarily took it upon itself to lower the test to twenty per cent. This was unasked for by the city, but it was accepted and contracts were made specifying that brick should be used of sufficient hardness that would stand the test and not lose more than twenty per cent. of their weight.

The first contract let under the new specifications was for paving Canal street between Leonard and Coldbrook. The brick have been shipped, nine carloads, and a test was made. It showed they lost in weight a fraction less than twenty-five per cent. The board having made the contract calling for brick that would stand the test at the twenty per cent. loss, refused to have them laid. The work has been stopped and the company's agent was before the board for the purpose of compromising, but the board stood firm. They say the brick will have to come up to the standard of their guarantee.

### MAY MAKE PAVERS.

D. P. DeLong, the well-known building brick manufacturer of Glens Falls, N. Y., an active member of the N. B. M. A., is investigating the paving brick business, the authorities of that thrifty city having determined to give brick a trial on its streets.



GERMAN NOTES.

It is the intention of the city of Vienna to establish a brick plant for manufacturing the brick used in city buildings. Land has been bought and all arrangements made to commence buildings in the near future. In lower Austria there are four towns which not only make enough brick for city use, but also sell them to private parties.

In Straussberg there is a continuous kiln fired with coal dust, and the arrangement has proven successful, a saving in fuel having been effected. By means of horizontal screw conveyors the coal dust is fed into the kiln very evenly. The quantity to be fed is regulated by slide dampers.

In a recent article in the Toepfer and Ziegler Zeitung the method of manufacturing mosaic floor tiles as practiced by the Mosaic Tile Co., of Zanesville, Ohio, is described quite thoroughly. The system used by this company has been invented by Mr. H. C. Mueller, sculptor and superintendent of the Zanesville works, who has been awarded the John Scott legacy premium and medal of the Franklin Institute for this invention. By this method the cost of manufacturing mosaic tiles has been greatly cheapened, owing to the substitution of paper patterns for the expensive metal ones. Over the die there is first put a plate provided with a close system of cells, over which there are placed paper patterns with holes through which colored clay powder is poured. For each color there is a paper pattern. The holes through the paper are punched by machinery.

SECOND ANNUAL CONTEST FOR THE N. B. M. A. SCHOLARSHIP.

ACCORDING TO THE action of the Association at the Pittsburgh meeting, the Trustees of the Ohio State University have been approached by the Committee on Technical Investigation, with a view to continuing the scholarship as auspiciously begun a year ago, and they have reported their entire success in the matter. The scholarship will be carried on, therefore, as in the year past, by a joint fund, \$250.00 from N. B. M. A. and \$100.00 from the University.

—What the Free Scholarship Means and How to Obtain it.—

1. A paid scholarship, to be known as the "National Brick Manufacturers' Scholarship," will be established in the Ceramic Department of the Ohio State University for one year, beginning Sept. 14, 1898, and ending June 14, 1899.

2. The recipient of this scholarship will receive the sum of two hundred dollars (\$200) per annum, paid in ten monthly installments, as compensation for his services.

In addition to the money actually paid him, all fees, dues, laboratory expenses, chemical supplies and other official expenses will be paid from the funds of the scholarship.

Further, one-half of the time of the student will be at his own disposition, provided only that it shall be used in the prosecution of such studies in the University curriculum as he may elect and be able to maintain.

3. In return for these advantages and emoluments the recipient shall give one-half of his time for each week day of the college year to such work as the Director of the department shall indicate. The duties will consist of experimental investigations into some problem of the clay industries to be designated by the committee and superintended by the Director of the department.

4. The selection of the recipient of this scholarship from the various candidates shall be by competitive examination, in which the following factors and weightings will be taken into consideration.

- A—Scholarship (by written examination..... 85 per cent.
  - B—Practical experience in the clay industries..... 10 per cent.
  - C—Special adaptation to the position..... 5 per cent.
- 100 per cent.

No candidate will be eligible for examination unless he is either personally known to some member of the committee or

can bring a certificate of good moral character from some person in authority at his home.

A—The written examination which is the principal determining factor in the contest will be conducted upon the following subjects and with the following weightings :

| Subject.                        | Weighting. | Remarks.                                                                                                                                                                                                                                             |
|---------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| English.                        | 5          | No formal examination will be held in English, but all the papers presented on other subjects will be criticised in reference to their correct use of the language.                                                                                  |
| Algebra.                        | 7          | Thorough Quadratics, Text book used in examination. Wentworth's                                                                                                                                                                                      |
| Geometry.                       | 3          | First three books, plain Geometry. Text book used in examination, Wentworth's.                                                                                                                                                                       |
| Physics.                        | 15         | Text book used in examination, Carhart & Chute. Gage, Appleton, or Harvey, are fair equivalents.                                                                                                                                                     |
| Elementary Chemistry.           | 15         | Text book used in Examination; Remsen's "Introduction to the Study of Chemistry."                                                                                                                                                                    |
| Qualitative Chemical Analysis.  | 10         | Text book used in Examination: W. A. Noyes, "Qualitative Analysis." Examination will consist of actual analysis of one unknown body, giving written statement of methods and reactions.                                                              |
| Quantitative Chemical Analysis. | 15         | Text books used in examination: N. W. Lord's "Notes on Metallurgical Analysis," and "Thorpe's Chemical Problems." Also, note books, showing actual work on quantitative analysis done by student must be submitted.                                  |
| Geology.                        | 5          | Text books used in examination: LeConte's "Elements of Geology" (smaller edition), "Tarr's Economic Geology," part two.                                                                                                                              |
| German.                         | 7          | Examination will consist of one-half hour's trial at translation from "Die Thonindustrie Zeitung." Each candidate will be supplied with a lexicon during trial.                                                                                      |
| Mechanical Drawing              | 3          | Candidates must submit at least 5 plates or drawings made by himself.                                                                                                                                                                                |
| Ceramics.                       | 15         | Candidates having had course in Ohio State University, will be examined on work as taught there. Candidates not having had this course will be examined on the following as equivalents: "Langenbeck's Chemistry of Pottery," "Zwick's Ziegelthone." |
|                                 | 100        |                                                                                                                                                                                                                                                      |

B—The grading of applicants on their previous experience will be based on the answers given to the following questions:

First—Name the branch or branches of clayworking in which you have had practical experience, giving the names of the companies or firms by whom you have been employed. (Brick-making, sewer-pipe making, pottery making, etc.)

Second—Give the time spent in the active pursuit of each branch.

Third—State in what capacity you were employed or if you were employed in more than one capacity; give the various positions occupied and approximately the period in each and the responsibility devolving on you. (Whether laborer, foreman, burner, clerk, etc.)

C—The third section of the examination on which a possible grading of 5 will be allowed is really only designed to guide the committee in case two young men of approximately equal acquirements as scholars and with approximately equal experience in practical work should contest for the appointment.

In this case, the committee will endeavor to determine by actual contact with the applicants that one who is most favored by nature and experience for the work to be undertaken during his period of incumbency. The committee regards it unlikely that any such contingency will arise, and expects that the written examination and past experience of each applicant will suffice to grade him properly.

5. The examination will begin on Tuesday, July 12, 1898, at 9 a. m., at Orton Hall, Ohio State University, Columbus, O. Each applicant must be present in person. No other examination will be held, and intending candidates must be there on time.

For any further information apply to Prof. Edward Orton, Jr., Ohio State University, Columbus, O.





THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

### BUTTON-HOLE TALKS.

Editor Clay-Worker:

From now on I shall draw the line on this button-hole business, firmly and emphatically, and shall draw it at surgeons. I have been button-holed by a surgeon. In my other experiences in the button-hole line there have been parties who were sharp and incisive, but none of them equaled this one. There have been those who took firm hold and insisted on exclusive attention, but none so insistent as this.

There is nothing, however, but has something of good, I suppose, and this probably carries with it lessons which are instructive. For instance, it emphasizes the fact that sometimes it is necessary to get worse in order to get better. Again, it gives one a chance to see things in a different light when he has to go way down into the edge of the dark river until he can feel the swirl of the chill, dark waters around him. To look out into the uncertain mists that are before him and to look back in retrospect on the life he has lived, as viewed from the calm and solemn position he then and there occupies. To realize that possibly the whole record is written, the work finished, and to see how hollow and scant and little it all is anyway when the opportunity to make it different is gone. Then, if further opportunity is granted, and he comes back out of the haze and mist to bright sunshine and flowers and loving faces, to ministering hands that have been fighting for him so bravely all the time he was shrouded in those mists, back to tender nursing and loving care, back to bright eyes that have all along fought down their apprehension, and for his sake shown confident and happy, not daring to let them see their doubt or catch even a glimpse of the dark sorrow hidden back of them, back to sweet, childish lips that have been stilled lest they disturb him and yet that have every night faithfully approached the Throne in his behalf, back to the joys of the present and to full hope for the future, then one can possibly realize that the pain and horror of the past may have been necessary in order to measure fully the joy and happiness of the present and future, and for the proper appreciation of their value, even as shadow is necessary to give value to sunshine in the landscape.

Generally, when a man dies, kind friends write his obituary, and, mercifully overlooking all error and fault, put down all of good they can glean from their memory, speaking tenderly and reverently. Few men have the pleasure of reading their own obituary, but I almost feel as though I was privileged to in the correspondence page of the May Clay-Worker. To these the mails have added one letter after another, laden with hearty congratulations and well wishes, until I agree heartily with the sentiment of one of those cherished brothers, who, in one of these letters of congratulation, said, referring to my sickness, "You want a little of this once in awhile to find out where you stand with your friends."

These letters are to me treasures that I shall store away to take out and read when I am blue and disheartened or possibly to use as collateral when I go borrowing money.

This page of the Clay-Worker makes me proud and generally puffed up. Purington, often tried and sorely tried sometimes, too, bears testimony first, but this was to have been expected. We Chicago men are expected to stick up for each other—and we do it. But McCain, long away from our sight, but never from our recollection; he, whose good, warm heart and active mind has endeared him to all; uncomplainingly bearing all the years of agony that he carries as a reward for his patriotism and bravery—congratulations coming from him, coming warm and true, writing as he does with nerves strained by those years of suffering and yet with a heart beating just as warm and true as ever, such kind words I am proud to store away as treasures for my children's children. Then Fiske, always re-

vered and looked up to with love and yet with awe. The busy thinker. Quick and incisive of action, always ready and always right. To think of him, in a city convulsed with the knowledge that bombardment was imminent, a city whose inhabitants were certain sure that if Spain was hunting anything, she would of course come to Boston for it. To think that this busy man, in all this atmosphere of frightful nervous tension, should stop to send his stricken brother hearty greetings and cheer him in his time of trial, is truly an honor. Then another veteran comes with another hearty greeting, and wishes I may live until I am as bald as Pike (just notice what a wealth of years is wrapped up in that wish.) He well knows that you can't kill a terra cotta man anyway, but he knows also how well wishes and good fellowship cheer and encourage. Then there blows a breeze from further north, but from one so warm-hearted that he hunts reminiscences in way-back conventions of which to say pleasant things.

All these letters, together with the bundle the mails have brought, tend to make me so puffed up and proud that I fear no one can live with me, and I begin to be seriously afraid that my head will become so swollen that I shall no longer be able to wear Morrison's hat.

GATES.

### Not Afraid of Spanish Shells.

My Dear Randall:

Yours of the 8th is received with much gratification, and in reply will endeavor to bear in mind the injunction to the parson to be "fervent but brief"

How am I? As well as can expect a boy of seventy-four to be. What effect has the war on our trade? It is "kilt entirely." What is the price of bricks? I wish I knew, but as I have left the Exchange, I cannot say. One inquirer was told eight dollars, but on the statement that that was too high, he was told he could have them for seven fifty. Being still too high, was told to give his address and he would write him. This being in the Exchange under rigid rules, you can see how uncertain must be an outsider who has left the Exchange, being tired of playing "heads I win, tails you lose." However, I do not think it best to wash our soiled linen in print, so will not dwell on this theme.

No, we are not lying awake nights on account of the Spanish fleet. For myself I have seen too much of Poco tiempo and manana manana in the West Indies, South America, California and Mexico to get nervous.

I am glad that Gates has his hinges well oiled again; may they never again get rusty.

As for D. V., I expect that if he ever comes to grief, like the boatman who had been run down by the steamer, he will sit on the hurricane deck on the last pile of bricks and sing "Hail Columbia, happy land, if I am not ruined I will be d—d."

There is nothing the matter, excepting that we are all starving for the grand confidence.

Patiently and hopefully yours,

New Haven, 6-11-98.

S. P. CRAFTS.

### Let Your Light Shine.

My Dear Mr. Randall:

Whenever anyone becomes a regular and welcome visitor to my house, I try to offer him something more than a mere shake and a chair. The Clay-Worker appears every month, and I have so far been too busy to show my appreciation by an occasional contribution. Besides lack of time, a lack of abundant ideas is my peculiar disease. Here is the first one that struck me for several months:

There are brickmakers' conventions and first-class technical papers, but in either of them all the conversation is among our own kind. We try to convince each other over and over again, every month and every year, that there is nothing to equal brick and terra cotta as building materials. We all believe it and know it, but there are a few people outside of the business who do not go to our conventions and do not read our papers, but who are supposed to buy our goods and who, at the same time, learn very little about them except through their architects. From experience I can state that the general public prefers a coarse, vulgar, rock-face stone front to a refined brick and terra cotta facade.

There is still existing a strong prejudice in favor of stone as against brick and terra cotta. The public en masse remains ignorant of the great superiority of our materials, and we have hardly done anything to improve their taste and increase their



knowledge through the medium of the papers which they read. You will probably agree with me that hardly anybody not connected with the clay manufacturing business reads your paper. Some few architects may cast an occasional glance at it, but the building public know nothing about its merits or even of its existence, and, if they did, they would hardly care to chew and digest all the technical terms employed by the experts. It is my opinion that we should begin to educate the masses; to tell them in plain, everyday language what the merits of clay products are; call their attention to the beauties of some of our best brick and terra cotta buildings, and create a taste for colors and refined ornamentation. This can best be accomplished by making use of the broadest channel of conveyance—the daily papers. I have no doubt but many of your correspondents could write articles which would be attractive enough to engage the attention of newspaper readers, and give them facts and information, easily assimilated, if properly dressed, which would in their mind enhance the value of clay products and tend to make them look more favorably upon these artificial products as compared with stone.

An old-time architect years ago asked the question "whether we proposed to give him something superior to the material which the Almighty himself put at our disposal." He forgot that the Lord gave us neither steel, nor glass, nor aluminum, nor anything to take their place, and that many vast stretches of land are devoid of nearly all substantial building materials except artificial ones. I believe that to-day ninety per cent. of our fellow-citizens do not go any further in the reasoning than that old architect did, and that it is our duty to shake them up, and by continual agitation in the right direction get them to agree with us that there is nothing like brick and terra cotta. I also believe that you publish many a fact and many an article in the Clay-Worker which any newspaper would be glad to publish, and that by careful selection you could, without much trouble, do a great deal for the good cause to which remains devoted, Yours truly, F. WAGNER.

#### With the Brickmakers of Baltimore.

Dear Clay-Worker:

The building trade here is very, very dull. This dullness cannot be attributed to the war, but to an era of speculative building, that has been going on for the past eight years, and in consequence we now have a large number of idle dwelling houses. Material men have no mechanic's lien, this right was taken from us by our Legislature of 1898, and that of course has brought speculative building to a standstill.

A number of our brick yards have not made a brick this year, some are running on short time. The demand for brick in Baltimore will probably not exceed 50,000,000 or 60,000,000 this year, the manufacturing capacity is about 150,000,000. The bulk of our brick are made by soft-mud process, a great many by stiff mud, one semidry yard and one dry-clay process yard.

While the building business, and brick business particularly, is dull, Baltimore's general business is fair and its future is bright. There is no doubt that the success of our country in the present war with Spain will expand and extend markets for American goods and open new fields to American manufacturers, and in this revival and extension of manufacturing Baltimore expects, on account of its location, to be largely benefited.

The increase of exports of the United States for year 1897 was nearly one hundred million dollars, the total for the year ending December 31, 1897, being \$1,079,863,018—26 per cent. of which were manufactured goods.

Baltimore is the farthest inland port on the Atlantic seaboard, and yet owing to its deep water approach (27 feet), is practically on the coast. Baltimore, situated 200 miles from Capes Henry and Charles is absolutely protected from bombardment by the defenses at the Capes and Fortress Monroe, also by the forts at North Point and Hawkins Point at mouth of Patapsco river (10 miles from Baltimore).

The more exposed cities of the Atlantic coast have been disturbed and alarmed, and projected enterprises have been abandoned, for the present, on account of the war. This has not been the case at Baltimore to any extent.

We are shipping steel rails (made here) to Calcutta, India, East London, South Africa, to Russia, etc. After the war we can expect an era of good times. There are a great many inquiries from large manufacturers for locations hereabouts.

Major Noble H. Creager, of the well-known brickmaking firm of Pitcher & Creager, was recently appointed by President McKinley chief quartermaster in the army, with rank of major, and has been assigned to active duty under Gen. Fitzhugh Lee.

Maj. Creager is a man of fine executive ability, and will execute any duties that may be assigned him in a creditable manner.

The tenth annual meeting of the members of the Builders' Exchange was held the 10th inst. The reports of the secretary and treasurer showed that the Exchange is in a prosperous condition. President Filbert declined to be a candidate for re-election, and Mr. P. M. Womble was chosen to succeed him as president for the ensuing year. August Wehr, a member of the N. B. M. A., was elected vice-president, E. D. Miller secretary, B. F. Bennett treasurer. The board of directors consist of E. D. Crook, Jos. T. Lawton, Jos. H. Heller, E. M. Noel, Theodore Krug, E. D. Preston, Henry A. Seim, Jas. Maginnis, Wm. Garthe, Hugh Sisson, Norman W. James and C. H. Classen. The latter is also a member of the N. B. M. A.

The repeal of the mechanic's lien law in this State is the cause of considerable trouble to the builders and building supply men. Already a number of law suits have been instigated, which would have been unnecessary with a good lien law on the the statute books. Among them we notice one by the Baltimore High Grade Brick Co. against Jas. W. Amos and others for over \$13,000 for bricks delivered. Brick manufacturers, lumbermen and building supply men generally will no doubt appeal to the next State Legislature for a new lien law.

Baltimore, 6-8-98.

PATAPSCO.

#### Good News From Alabama.

Editor Clay-Worker:

Always welcome, the May Clay-Worker was particularly pleasing, bringing as it did goods news of our dear friend Gates. I am rejoiced to know that he is himself again. We could not survive the loss of so worthy a member. It is encouraging to note that our brethren up your way are having a busy season. We have been running at full tilt ever since the convention, and now have plenty of orders on hand. The war does not seem to have hurt our section at all, but, on the contrary, all lines of trade are brisk. Iron looking up, which means as much to us as high wheat to the Western farmer. We have not done anything toward the extension of our plant yet. Will not now before next year. We have made both small and large pavers. Some cities prefer the large block, and others our standard size paver. Most our output is the latter now, and we are correspondingly happy. We make them cheaper and get a larger per cent. of number one pavers. Wish all the cities would adopt the standard size. At Montgomery they pay us more for the small paver than the large. The able city engineer of that town has a great head on him. He knows a good thing when he sees it. Very hot and dry here now, but just the weather for brickmakers. JOHN W. SIBLEY.

Coaldale, Ala., 6-10, '98.

#### Light Ahead—Business Outlook as Viewed by a Chicagoan.

Editor Clay-Worker:

The commercial agencies all report a general improvement in trade throughout the country. The clearing house reports indicate a large increase in the volume of business done through the banks; wholesale and jobbing houses are, as a rule, doing more and making more money than for years, and every branch of trade affected directly or indirectly by the war is having more or less of a boom. Cotton and woolen factories are running on overtime, and the capacity of packing and meat curing establishments and of canning factories is being taxed to the utmost. The price of sugar, tobacco, rice, hemp and every other product of the West Indies and the Philippines has largely enhance in value, and the dealers in them wear cheerful, smiling countenances, but all who have their money invested in unimproved real estate, or the production of building material, wear visages easily recognized by their extreme elongation. The actual consumption of building brick in Chicago during 1898 will not exceed one-fourth of the capacity of the yards. Considering the light demand and the excessive supply, prices are being fairly maintained, and there is no doubt but that with a demand equal with the ability to supply, even at present prices, manufacturers would have a fair year, but with present conditions no Chicago manufacturer will take a European trip on his profits for this year. What is true of the market for brick in Chicago seems to be generally true throughout the country. Just why the whole country should discover that it was overbuilt at about the same moment, is an



economical problem too deep for me to fathom. The war so many of us deprecated and believed unnecessary is upon us, and, as good American citizens, whatever our previous views may have been, we must now do all in our power to sustain the government. Some government official has estimated that if the war should come to an end within one year our expenses would not exceed \$600,000,000. I lay no claims to statistical ability, but my judgment is that the estimate is far too low. Be that as it may, the greater portion of these expenditures will be within the limits of our own country, and as a financial proposition differs little from that of an individual taking money from one pocket and putting it into another. Just what the results of a year of actual war upon the country at large will be would require a prophetic vision greater than has yet been developed. Who could have foreseen at the beginning of the War of the Rebellion that the far-reaching result of that war, pregnant with influences and conditions which have changed the location of our population, remodeled our geographical lines, and moved the center of our civilization and population more than three hundred miles to the westward? Who can tell whether or not the present war will result in changes fully as important? The boys of '98, like those of '61, are even now cultivating a spirit of restlessness which may change the whole course of their lives. When they return they, or at least a large proportion of them, will realize possibilities they would never have dreamed of but for the war. Many of them will lose their inclination to obey as knowledge comes to them of their ability to command. We may as well awaken to the fact that war—cruel, bloody, horrible and unnecessary as it always is—still has its compensations. The present war can scarcely be called a revolution, but it will be found to be decidedly revolutionary in its effects upon all our moral social and political institutions. No class in our country will be more largely or directly benefited than the farmer. The waste of war comes after the goods have been sold by the farmer and paid for by the government. The prosperity of all other classes in our country depends upon that of the farmer, and it is this axiom that should encourage us to hope for brighter days. The farmer rarely hoards his money; he spends it; and the improvement in our commercial and financial condition now over one, two or three years ago is almost entirely due to the advance in the price of all agricultural products, enabling the farmer to cancel his mortgage, to pay up his interest, to purchase new machinery, clothing, carriages, furniture, etc. To the Chicago brickmaker who can hold on and wait patiently, there will come a time when out of their surplus earnings and savings his neighbors will build houses, barns and storehouses suitable to their needs. The time will also come when he will forget the remorse of the past five years for having been a leader in the overbuilding he now believes was so detrimental to his interests. Chicago is daily and hourly increasing in population and wealth, and the roof surface necessary to cover one and one-half millions of people in 1892 will at no distant day be found inadequate to protect two and one-half millions, and sooner or later the present brickmaking capacity of our city will be inadequate to produce material for its demands. This may not come during the business life of the older manufacturers, but they should be broad enough to rejoice over prospects beneficial to the craft, even beyond their time. The rule by which we should be governed is: Economy in our expenditures, improvement in the quality of our product and the cost of production, watchfulness in regard to the possibilities of its adaptation for new uses, and, above all, patience.

Chicago, 6-7-'98

D. V. P.

### What is a Fair Royalty?—The Village Brickmaker's View.

Editor Clay-Worker:

Royalty for a well-equipped brick plant is a question mainly of finance, hence theory, backed up with facts. It is evident when we rent a plant we must provide:

First—For the return of the plant at the end of the lease.

Second—That we shall charge such sum for accidents, wear and tear and renewals each year as will at all periods of the lease keep the property whole.

Third—That our capital shall earn a fair income for its use.

Fourth—That the royalty shall cover the removal of the clay by mining and the possible shrinkage of the value of the ground on this account, although there are cases where the land is worth as much or more after the clay is removed as prior thereto, especially in towns or cities.

Fifth—That the lease shall be so drawn as to fix a minimum sum per year to be paid us, whether the lessee make brick or not; or, failing this provision, that the royalty be so increased the years he does produce stock as to cover this contingency.

It will be assumed that our brick plant shall produce 50,000

brick per day, and that its minimum output shall be 10,000,000 brick per year. It will also be assumed that its plant of kilns, brick machines, dryers, engines and miscellaneous tools shall cost \$20,000, exclusive of the value of the land. Our problem on these assumptions will be as follows:

|                                                                                |         |
|--------------------------------------------------------------------------------|---------|
| \$20,000 plant, subject to annual payment for renewals of say 13 per cent..... | \$2,600 |
| \$20,000 plant, subject to annual payment for rent of capital, 7 per cent..... | 1,400   |
| Rent of clay lot for 10,000,000 brick at 25 cents per 1,000..                  | 2,500   |

Making minimum royalty per year.....\$6,500

Average royalty per 1,000 brick would be 65 cents.

While, of course, it is not possible to give actual facts as to the above items that will fit all circumstances, the theory is the same for each case, and each individual can apply the facts as he has them, and work the results to correspond thereto.

Our facts are that in an experience of seventeen years, with a plant of an average cost of \$2,600, that we have spent to repair and renew the same \$5,800 (and we have never had an accident, except shedding crushed by snow storms), and hence that the yearly outlay for these accounts has been \$341, or a little over 13 per cent. on the investment. As the business is one of at least moderate hazard, and often of serious risk, it is estimated that 7 per cent. would be a fair return for this money invested largely for the benefit of other people.

The rent of clay ground for brickyard purposes, with the right to mine clay, in our neighborhood of Philadelphia, Pa., has been for many years reckoned at 25 cents per 1,000 brick taken out.

Hence it would appear that the minimum royalty for a well-equipped brick plant hereabout would be as before stated—65 cents per 1,000, while it is probable that, assuming contingencies of a less production on the part of the lessee, the figure of royalty might run anywhere from 65 cents to \$1 per 1,000 output.

THE VILLAGE BRICKMAKER.

### The Galesburg Pavers.

Dear Editor :

Your letter asking of the condition of trade in paving brick at this point duly received.

It is difficult to state thus early in the season just what the prospects for the season are. All our town boards and aldermen are elected in April, and it takes at least two months to get them in fairly working order or to get ordinances for new work passed and far enough along to advertise for and let contracts for paving. It seems to us that there is to be a much larger amount of paving done this year than was done in 1897. Inquiries for samples and prices have been more frequent than ever before, and there is a stronger feeling in the market this spring than for some years. The Purington Company are running two machines. The Terra Cotta Co., the Galesburg Paving Co. and the Galesburg Vitriified Co. are running full time. The Terra Cotta Co. have already finished one good contract at LaGrange, Ills.; the Vitriified Brick Co. one in Galesburg; the Galesburg Co. are now delivering a large contract in Waukesha, Wis., and the Purington Co. have just finished a large shipment to Chicago, for Dearborn street. All these companies are making a better brick than ever before, and are in shape to fill large orders from stock on hand.

All these companies are stiffer in prices than last year, and are evidently a little weary of making brick for fun. We would all be thankful for one like '91 and '92.

Sincerely yours,

PAVER.

Galesburg, Ill., June 6, 1898.

### The Situation in Chicago.

Editor Clay-Worker:

I do not recall any war of the past which has brought a season of general prosperity in business to the countries engaged in it. On the contrary, while certain contractors, speculators and dishonorable persons may have an unusual opportunity to work out their schemes, the result of war has always been destructive; not alone of treasure, property, blood and happiness, but also of commercial property.

Already in this our day, and as a result of the war in which this country is now engaged, many, if not all lines of trade, have been affected on the side of depression. Perhaps this is especially true as regards real estate and building, were the prospects of the war being long continued more manifest there



would undoubtedly be more in evidence as to its depressing effect upon the business interests of the country. At the time of the declaration of war with Spain the business community of the whole country were enjoying such advances in commercial affairs as it had not known for years, and thus far the momentum has not been fully brought to a stop, and it now looks as though it would not be fully brought to a standstill, unless some serious reverse should befall our army or navy.

There has been a decided shrinkage in Chicago in new building enterprises. The month of April showing a decrease over that of April 1897, of \$293,590, and a decrease of over \$1,000,000 over 1896. The month of May shows a little rise and some improvement over April, the increase being about \$96,000 over the April record. This would indicate that the feeling is growing among investors that the war is to be of short duration, and that the general business improvement which had started in at the beginning of the year is going to increase.

Among new building improvements to be begun in the near future may be noted the remodeling of Marshall Field & Co.'s retail store, at the corner of State and Washington streets which will be raised to an eight-story building and sundry improvements made in its front elevation. The estimated cost is \$130,000. Schlesinger & Mayer have closed a contract with Louis H. Sullivan, architect, for the construction of a new building at State and Madison streets. E. H. Van Ingern will have constructed a ten-story building at corner of Jackson boulevard, covering 50x160 feet. The exterior to be of pressed brick and stone trimmings, steel construction. The improvement will cost \$90,000.

On May 1, the stone cutters of Chicago went out on a strike owing to the fact that the bosses would not submit to be dictated to as to the number of men to be employed on each stone-cutting machine. The stone cutters' demand is that four men shall be employed for each machine operated, regardless of the number of men actually required to do the work.

There have been several meetings of committees of the bosses and the workmen, but there does not seem to be any prospect of an early settlement of the differences between them. As a result of this strike many buildings which should now be ready for the roof are not above the foundations, and no advance can be made until some agreement is arrived at. Both sides at the present time are not giving any indications that they will surrender, and the stone cutters are claiming they will not go to work as long as they have a dollar left to live upon.

The Builders' Club of Chicago have taken possession of their new quarters on the fourth floor of the Chamber of Commerce building, corner of Washington and LaSalle streets. The location is more central to the membership than their former one on Monroe street, and in many respects the new quarters are more desirable. They are very beautifully decorated and furnished entirely new, and are very attractive, and much credit is due to the officers of the board and the house committee for the very complete arrangement. Their very popular secretary, Mr. Edward Scribner, is always on hand at the right time and at the right place to see that everyone is made welcome and happy.

Their present quarters are in no danger of being destroyed by fire, as their old ones were, the Chamber of Commerce building being of entire fire proof construction.

The membership is increasing since the removal to the new quarters, and it is undoubtedly more convenient to the members of the club than any other location that could be selected. The Chamber of Commerce building itself being largely filled with contractors and builders in different lines.

Chicago, June 11, 1898.

COSMOPOLITAN.

### Philadelphia Pavers.

Dear Randall :

I was more than pleased when I read in the May Clay-Worker that our mutual friend Gates was "out of the woods," as you know I think Gates is "one of the salt of the earth." It takes a certain proportion of Gates' to keep things right—good, clean, bright fellows, that differ from the rest of us in so many ways—particularly in the faculty they have of resting or appearing to rest from the ordinary cares of life long enough to inject some good, wholesome thoughts into the rest of us. Enough to start us thinking that it should not be all work, all strife and hustle for the dollar or fame, but that there is something better than all this that we should aim to reach, and enjoy a little of it, and help others to do the same. Long live Gates and all his kind.

Boss McAvoy has retired and is now located on his farm near Perkiomen Junction. He has made a beautiful place of

it, and is enjoying himself to the full. With his family of children and grandchildren about him he is in his glory, and is in excellent health and spirits.

Business is fairly good in the paving line, but the demand for building brick is rather slow. Not much doing for what was done. Our works are running smoothly, making 1,000,000 pavers per month. In addition to this have purchased the output of one of our neighbors for the year to help fill our orders. There is considerable paving going on in Philadelphia and thereabouts. The size decided upon this spring for all future work is as follows:  $8\frac{1}{2} \times 4 \times 2\frac{1}{2}$  inches. A very convenient size as you see, and lets us dispose of our discards for builders and sewers.

The war has not apparently hurt us much. One of our boys, Tom, Jr., was going to go, but we talked him out of it, and I now have him on the works with me in charge of the clay bank and the preparation of the shale. Hope to make a brick-maker out of him. He appears to be cut out for it. The other boy is not built so warlike. He was wise and concluded that holding down the office end was cooler than going to Cuba. He is very dressy and was afraid that he could not get the latest in clothes, etc., in Cuba. Prefers to purchase his clothes at a swell tailors, rather than to have them furnished by the government. Thinks the government might not have just his exact measurements on their books, etc.

Haven't seen "Chaplain" Flood for some time, but understand he is pursuing the even tenor of his way with his accustomed good humor, never failing to grasp an opportunity to enjoy a chat with a friend or neighbor and so ease the daily grind of brickmaking.

FRANK McAVOY.

Philadelphia, 6-10-98.

### Canton Pavers.

To the Clay-Worker:

Undoubtedly it will be gratifying to many readers of the Clay-Worker to hear from the brickmakers of the city that furnished this Nation with our present President and Secretary of State. Although celebrated and known for this, we are not proud and stuck up, but are always ready to be sociable and to exchange the progress of current events with our fellow laborers in the clay industries. The writer has made it his business to gather the news of the doings of our shale brick manufacturers, as well as those in other lines of the clay industries in this section, which we shall be pleased to impart herewith. As we greeted the operators on our rounds and asked the usual question: How is business prospering? The universal answer was: Much better than it did from '92 to '96, but—There are always buts. Many times these come in when there is no occasion for it. Here in these cases, however, I think, the facts warrant the after expression. The complaints are: The prices on goods are too low. This proves to be a fact which all the paving brick manufacturers can affirm. Prices on paving brick that necessity established during our hard times, have not advanced to what they should be to make it a profitable business. Probably if the pavers could be used to hurl at those pesky Spanish forts and boats, instead of the expensive steel projectiles, fancy prices might be secured, even as those favored ones receive that have the means to make them, and the cinch on the government.

I must guard myself from running into a war discussion, hence will bring myself back to the subject with a jerk, and tell what the Canton brick men are doing. It is needless for me to tell that the Canton shale is the best material in the country, and makes the best pavers in the world. I am not yarning about this. Everybody knows it, and if some do not believe it, write or go and see Major McKinley or Secretary Day, the highest authorities in the United States. If these gentlemen do not answer, write here and we will tell you so ourself.

As these are facts, it stands to reason that when extra good pavers are wanted anywhere this side of California, the order comes to Canton. D. V. knows that, but as he lives in Chicago and some are wanted there, he tells them his are just as good and cheaper, and sells them, too. Well we can't expect to have everything.

The Canton firms making pavers, leaving jokes aside, have all they can do. They are running full time, and turn out per day as follows:

The Canton and Cleveland Brick Co., 45,000 in the Canton plant and the same amount in the plant located at Willows, south of Cleveland. The Royal Brick Co. (formerly operated by Otto Giessen, deceased), puts out the same amount. The Imperial Shale Brick Co. has a somewhat larger capacity.

These four brick factories work together under the name of



J. L. Higley & Co., the genial Mr. Higley having charge of the general office in the Erwin Block.

The Cleveland Brick Company, located here, on the east side of the city, have orders to last them until next summer. They furnish the shale brick for the new water tunnel and the great Walworth Run sewer at Cleveland. This firm has confined itself mostly to making building brick of shale, and have been running steadily, even during the dull times.

I learned that J. L. Higley & Co. are shipping and have shipped lately to the following States: Massachusetts, Connecticut, Michigan, Pennsylvania, and, of course, Ohio also.

The rates of output given above are based on the standard size paving brick, measuring  $2\frac{1}{2} \times 4 \times 8\frac{1}{2}$  inches, weighing 7 pounds a piece, or  $3\frac{1}{2}$  tons per M. The paving blocks measure  $3\frac{1}{2} \times 4 \times 8\frac{1}{2}$  inches, weighing 10 pounds each and 5 tons per M.

The brands put in the market now are: In brick—the Imperial, Red Granite and Royal. In blocks—the Metropolitan, Iron Rock and Century. The numbers of these bricks and blocks to lay a square yard are: For wire-cut blocks, 41; repressed blocks, 42; wire-cut brick, 58, repressed brick, 60.

Besides these firms already mentioned, we would also refer to the Canton Stoneware Co., making not only paving brick and blocks, but also firebrick. This is a well equipped concern for making stoneware, covering a large extent of ground. The stoneware industry labors also under the disadvantage of having to sell at very close margin. Another firm located near this plant, makes a superior class of buff and red front brick, made with the semi-dry process.

A new clay industry has also lately started up here on the site of the Champion Stoneware Company's factory, which burned out some time ago. They manufacture clay marbles and propose to extend it to a large scale. They utilize the kilns which the fire left intact for baking them.

This letter is becoming more lengthy than I intended, or would touch upon other industries in the line of clayworking, which will come later.

F. C. FREY.

Canton, O., 6-11-98.

### Purpose Essential to Success.

Editor Clay-Worker:

Any man, be he "priest or layman," who has attended the later conventions of our association must have been impressed with the fact that a new era is dawning (or perhaps has dawned) on the horizon of the brick and kindred industries. It is getting more evident that the rule of thumb days are passing rapidly on the stream of improvement, and will soon be swallowed up in the ocean of scientific attainment.

Not very long ago age was a very important particular in a brickmaker's list of attainments, twenty or twenty-five years of experience being considered as indicative of just so much valuable knowledge, but by the rapid evolutions now taking place in our industry this feature is losing its force and another requisite taking its place. The standard by which man's ability is judged is being continually raised, not from choice exactly, but from the necessity that it be a standard in the proper sense of the term. Attainments that would formerly have placed a man in an unquestionably superior position are now becoming commonplace or ordinary, so the man that would still retain his more or less exalted position must, perforce, rise with the standard; otherwise he will soon be mingling with the motley crowd and his individuality lost.

There are causes for this, as there is for every effect, and they are easy to find, but we are more interested by the effect and its consequences than by any possible cause, and it is with these this paper has to deal, with possibly a casual mention of some of the causes.

No business can be run successfully on uncertain or chance lines. As long as brick manufacturing was conducted only on small capital by small concerns or individuals when brick-making was thought neither an art or a science, but merely a business, and when lack of competition allowed a big margin for "chance happenings," just so long did the old standard obtain; but now—(If I could put the characteristic shrug of a Frenchman on paper I would put it here; it is chuck full of expression, and would fit.)

The chief requisite of a successful man to-day is education, with all that term implies. Not merely the three R's of our forefathers—reading, 'ritin' and 'rithmetic—but education in its broadest and fullest sense, and the man that is the most successful to-day is "the man with a purpose," he who sets his mark a little higher than the accepted standard and then allows no obstacle to hinder his journey, and making use of

disappointments and seeming failure only as stepping-stones to a higher plane.

This educational demand has naturally given birth to institutions designed to meet and foster the new conditions. Our trade journals (very notably the Clay-Worker) have laid themselves out to help progressive men also that they themselves may keep in the van of the army of progress. That very praiseworthy and invaluable institution known as the Ohio School of Ceramics is also an outgrowth of this demand, and by the excellent showing of its graduates can not fail to be the means of not only keeping up the high standard, set, but of supplying men capable of filling the requirements. We have not a man in our ranks who is listened to with more attention (and profit) than is Professor Orton; and why is this? It certainly is not the respect due to age. It is not the homage expected by the charter members of our association; nor is it the deference to high-flown oratory. It is none of these things, but it is because that all he says has been reasoned out; because all of his deductions are based on results scientifically obtained, and because we know that his education has been of such a nature as to especially fit him for the work he has undertaken. Under his supervision and training the boys now under his charge are studying with a set purpose. Their energies are bending one direction from the base of a cone to its apex. The base is composed of the elements of geology, mineralogy, chemistry, applied mechanics, mathematics, geometry etc., but the apex is just clay-working. Everything is merged into that peak, and the future clay-worker issues ready to begin serious business with the burnishing of practical experience.

Any brickmaker, young or old (but especially the younger branch) that could read the papers read to students at Columbus by Bros. Gates, Richardson and D. V. Purington, without being vastly the better for it, should quit the business right away; it is not their place; their soul is not in it; therefore, they would never make a success of it, but might of some other vocation.

Colleges are not accessible to all, however willing to enter and to those debarred the excellent journals devoted to our industry appeal. In them every branch is treated, and from every conceivable standpoint, not the mechanical branches only, but the office, market and finances receive their share of attention. Progressive men are kept in touch with the very latest improvements of processes and novel experiences of others. They are in themselves an education of a practical and high order, and cannot fail to be of incalculable benefit to the earnest seeker of knowledge. If you see a young man taking a deep interest in his trade papers you see a man that can reasonably expect to hold his own in the battle of life. It is well to keep before us that "Great things are not accomplished by idle dreams but by years of patient study." Young man, set your mark, formulate your purpose, and then, as undeviating as the needle to the pole, steer for the goal of your ambition, remembering (as aptly expressed by Bro. Purington) "You are not going to be sought by a busy, work-a-day world unless you know how to do its work better and more economically than it has been done before." CARSON.

### Raw Clay Roads.

The Okahumpka road, extending six miles south of Leesburg, Fla., through lovely scenery, is being graded, preparatory to being paved with clay. The road will be finished by autumn, and when it is done Leesburg will have over twenty miles of hard roads, extending in all directions. Two-thirds of the expense of this work comes out of the private purses of the citizens, the remaining third being paid out of the district road fund. The average cost of making these clay roads is about \$300 per mile. In that sunny sandy land a good coat of clay makes an excellent driveway of what would otherwise be a very "heavy" road.

We direct the attention of those of our patrons who desire to seek a foreign market for clay products or clayworking machinery to the ad. on page 540.

### \$1.00 EXCURSION TO DECATUR AND RETURN.

On Sunday, June 26, 1898, the Indiana, Decatur & Western Ry. will run a special fast excursion train to Decatur and return.

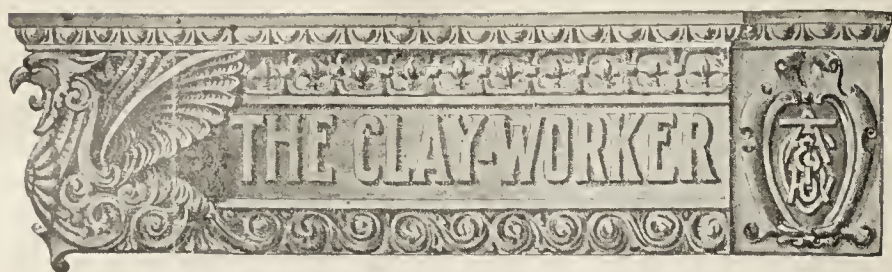
Fare for the round trip, \$1.00.

Special train will leave Indianapolis 7:00 a. m., arriving at Decatur at 12:00 noon. Returning special train will leave Decatur at 6:30 p. m. Tickets good only on special train.

JOHN S. LAZARUS.

General Passenger Agent, Indianapolis, Ind.





Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

#### TERMS OF SUBSCRIPTION:

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| Ten copies, " " " " " "                     | 15.00   |

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

#### ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to  
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXIX. JUNE, 1898. No 6.

#### CURRENT COMMENT.

As announced on page 520, the second annual contest of the N. B. M. A. scholarship in the School for Clayworkers, will be held at Columbus, Ohio, July 12. Those desiring to enter the contest, which is open to all, should at once communicate with Prof. Orton.

\* \* \*

The domestic event of the month is the opening of the great Omaha Exposition, which was attended by fitting ceremonies, including the usual touching of the button by President McKinley. There was a great crowd of visitors, and the show was declared a success.

\* \* \*

The grounds have been beautified in many ways, but the permanent improvement of most interest to brickmakers is the brick pavements about the lagoons, etc., which consumed over 2,000,000 pavers. If no brick machinery is exhibited in Machinery Hall, the product of the kilns is much in evidence.

\* \* \*

We have long suspected that the publishers of our Chicago cotemporary are of Spanish extraction, and now the suspicion is fully confirmed by their recent typewriter pronunciamentos and declarations of victories achieved, with which they have recently bombarded our advertisers. For real buncombe they outdo Weyler and Blanco rolled into one.

\* \* \*

The month just past has been crowded with events of general interest. The most notable development is the uniform patriotism and unanimity of the American people. Never before have we seen Old Glory displayed on every hand as now. From the cottages of the poor, as well as from the homes of the rich, our flag waves proudly, kissed by every passing breeze. Nothing like it has occurred since the war of 1812-15, when, our octogenarian neighbor tells us, the traditions of the Revolu-

tionary war were still fresh enough to easily arouse and unify public sentiment. Hence that war was universally popular. There was then no anti-war faction, much less an anti-war party, though a few individuals sought to make political capital out of it, as they and their kind would even seize upon their mother's calamity for selfish ends.

\* \* \*

At the time the war with Mexico was declared there was energetic protest by those who believed it was provoked and promoted in the interests of slavery, that there might be more territory acquired for the slave States, and not without cause, as the sequel demonstrated, though, in the spirit of true patriotism, most of those who protested rendered loyal aid after war became a fact. The late civil war was largely a war of sectionalism, though from beginning to finish there were many in each section whose sympathies were with the other section, and who rendered it all possible aid, leading, in some instances, to organizations in aid of the other side. This was specially true in the North, where formidable conspiracies existed, and had to be held in check by those at home while the soldiers were fighting the enemy in front.

\* \* \*

But the present war develops a most wonderful unity. There is no North, no South, and men of all political parties vie with each other in rendering aid to such a remarkable extent that the President has appointed his most formidable competitor for the presidency to a conspicuous position in the army. So far there has been hardly the least criticism of the management of the war. Congress, in some instances without a dissenting vote, has granted to the President whatever he has asked for, and in no case has any measure assumed anything like a sectional or a party question. Perhaps the nearest approach to dissension has been shown by a class of cross-roads politicians, who are forever on the outlook for something indicating that some how or other the rich intend to oppress the poor, but very little of this spirit has been developed in Congress or elsewhere among men of intelligence.

\* \* \*

It did not need this war to convince any candid, thoughtful man that the survivors of those who wore the gray thirty-five years ago, and their sons, now love the stars and stripes as devotedly as those who wore the blue. It is a common flag to all now, and men who were conspicuous in the rebel army are now as conspicuous in the American army, and as much trusted. The only fact that seems to modify this statement is the slowness with which some of the Southern States have furnished their quota of troops, but this is easily explained. The quota was drawn according to the population, including colored and white, while practically (in the Southern States especially) enlistments have been wholly among the whites. Thus this feature scarcely deserves mention. When all is said and done it will be found that the South has done its full part nobly.

\* \* \*

Perhaps the most notable development of the less than fifty days of war is the effect already apparent among the natives of Europe. Until about the first of May the average European regarded us with manifest indifference as a nation. They admitted we could raise good wheat and a great deal of it, and our pork was palatable, though there might be a trichina or so too many for healthfulness, or at least enough to justify unfriendly legislation lest it compete with their home product, and that we could build railroads and factories and grow rich, but they thought we knew but little and cared less about war. Now it is different. Naturally the consensus of opinion in all Europe seems to be that as we have kept Europe out of America, so Europe must keep us in America. We will see about that later on. We predict that there will be no concert of the powers to interfere with Uncle Sam, either at home or abroad, but that, on reflection, they will follow the example of the



illustrious Kentuckian who got rich by minding his own business.

\* \* \*

The Clay-Worker sees no reason for changing its views relating to the outcome of the war. Spain will be conquered, while, by her own act, she has released us from so much of our original purpose as limited us to the liberation of Cuba, that if we make "coaling stations" of Porto Rica, Manila and a few other outlying islands, or even of Cadiz itself, she will have herself to thank for it. Meanwhile we are happy to announce that generally the demand for brick is good, and prices, though not high, are fairly remunerative. Those who have not gone to war are pushing things, and the Clay-Worker never had a better corps of correspondents or more appreciative readers. In other words, business is going on just as though there was no war, and our readers who are sticking to their business find that it is sticking to them, just as we predicted it would.

### BRICK HISTORY.

One does not have to be elderly to note a distinct difference as to the character of the brick supply at this time and a few years ago. Then we used to hear not a little about June brick. That was the time when the supply of the new year's brick came in. Brick were burned in the fall and carried over for spring use. Speculators or others would buy up the supply during the long months of winter, and hold for a good price in the spring. The brick of the spring came in during May or June. Now, as we know, the supply of brick is perennial. This represents a great change within a few years. Then it was that the brickyards were in the suburbs of all the towns and cities. A large portion of the brick which comes to this community are shipped from a distance of about seventy miles. Another large supply is shipped from a point thirty miles distant. While the supply of the local yards is large absolutely, relatively it is small. Brick are now sold so cheap that they have to be sold in large quantities. The small domestic yard which does work in a primitive way is a thing of the past.

### PROMPT DELIVERY.

In this community the matter of brick supplies was revolutionized by a matter of prompt deliveries. Some years ago brick deliveries were uncertain; promises were ample. Under present conditions one wanting supplies can make a contract with an absolute certainty as to delivery. He may say on Saturday that he wishes 65,000 brick on Monday, and they will be delivered. A recent occurrence in this city was the delivery of 100,000 brick at one job within twenty-four hours of the time of signing contract. Deliveries of this character practically changed the source of supply in Indianapolis.

### GENUINE AND IMITATION FIRE PROOFING.

The question of fire proofing, which might be considered from a technical standpoint at greater length than can be in this department, is one of importance to the clayworker. Corrugated iron, cement and plaster are being used as a counterfeit fireproof material. Where one finds a good dollar in circulation he is liable to find it followed up by a counterfeit. The original asphalt paving material has been followed up by counterfeits. Burned clay fire proofing has been followed up by another counterfeit. We have the "just as good" talk along with impudent claims of superiority. So far as proper fire proofing material is concerned, there never has been any serious question as to the reputation of properly constituted burned clay. This reputation has been developed naturally and logically. It is a reputation which is the result of real merit. Now as to these cement fire proofing system: Those employing expanded metal, metal lath, corrugated metal, wire,

and cement and plaster—these are all gotten up with the one idea—the one distinct claim of cheapness. We have in mind a number of concerns connected with this work whose single thought has been to produce a cheap fire proofing material. The issues have never been: Here we have something which is superior in its fire proofing quality. But in connection with this class of fire proofing it has always been, we have something cheaper and lighter than ever before. The average of fireproof floors, when made of burned clay, weighs in the neighborhood of 100 pounds per square foot, and the average of these corrugated metal and wire proofing is from forty to forty-five pounds per square foot. Occasionally we hear it proclaimed that here is a system which only weighs thirty-five pounds per square foot, or that here is a partition that only weighs twelve pounds. Taking it all in all there can be no question that the struggle in developing cement fire proofing has been to produce something cheap. A high ideal of real value has been largely lost sight of. The cement fire proofing establishments have a pull in cheapness. They are well organized, and we fear that it will require similar organization on the part of those interested in real fire proofing in order to place this material properly before the world. An architect is often asked "What kind of a building is this to be?" He says, fluently enough, "Oh, it's to be a first-class fireproof structure." This question satisfies a very large majority of people. It is our suggestion that this matter of fire proofing should be taken up and thoroughly ventilated, in a manner to show truly the respective merits of the two materials.

### WANTED—PAVING BRICK MISSIONARIES.

With a few exceptions, paving brick manufacturers have seemingly abandoned the large cities to the asphalt forces, depending serenely on the smaller towns for their chief market. They are likely to have a rude awakening soon, and find that even the small towns will be invaded by the asphalt combines, for the latter are developing what they term railroad plants for use where the demand is not sufficient to justify the establishment of permanent plants. The Warren-Scharf people recently purchased one of these portable outfits in Indianapolis to be used in the small towns throughout the State. The entire equipment is mounted on flat cars, and so may be readily transported from town to town, and will enable the asphalt contractors to put in their material where, no doubt, brick would otherwise be used, notwithstanding the fact that for such communities a good brick pavement is much more satisfactory than asphalt.

How best to resist the encroachment of the common enemy is a matter that brick interests may well consider earnestly. Whether it can be done by individual effort is a question. It certainly can be done more effectively by concerted action, so we suggest that the paving brick manufacturers get together and consider ways and means. If the paving brick men of each State could arrange to meet together at stated intervals, and work with and for one another in these matters of common interest, much good might result.

For example, they might emulate their opponents (asphalt men always oppose brick pavements), and employ bright, forceful men to advocate the use of brick. In our own State, for instance, there is room for two such men who might put in all their time in the smaller cities like Muncie, Anderson, Marion, Peru, Columbus, Kokomo, Richmond and New Albany, and do nothing but talk brick pavements. They must be men of good address and good, natural political sense that would enable them to associate and have an influence with the best people. It should be their business to create a sentiment in favor of brick as a paving material. Missionary work of this sort will not only attract attention to brick as a paving material, but will make business in the abstract; that is, as a result of such work, there will be paving where



there was none before. There is no reason why the manufacturers of paving brick could not combine and carry on a campaign of this sort. It is just what the asphalt people have done and are still doing. We met a young man a few days ago who is making a tour of the cities such as we have mentioned. In the course of a year he will get business out of every one of them. He is a bright, shrewd, good-mannered young fellow, and is devoting his entire time to the asphalt interests. Others like him could do the same for brick, and there is no good reason why they should not.

#### LOCAL AGENTS FOR PAVING BRICK.

In connection with our suggestion for traveling advocates of brick paving materials, we would suggest that there should be local agents operating on a commission basis. There are influential people in every prominent town who could be used for this purpose. They are not cheap, light-shod men, but are the distinguished citizens, the man in high standing who poses, distributes his opinions with force, has a manner all but philanthropic, but with the philanthropy left out. These are the kind of men who help to make public opinion, and they will help to sell brick—if there is anything in it.

#### A LOCAL EXPERIENCE IN COMBINATION.

During recent weeks it was apparent that there would be a fair demand for brick. The local dealers got together and began a discussion as to methods of securing a fair price for their product. The meetings were fairly harmonious, and it appeared that success was in prospect. There was an advance of about a dollar a thousand, as a tentative agreement dependent upon the conclusion of the organization. About this time a number of school buildings were erected, and the understanding, supplementary to the final organization, was that no brick were to be sold for less than a dollar rise on the earlier price. In the meantime one of the local members went outside, gave his price on brick at a much lower price, and made the sale. This was discouraging, and at the present time this community is farther away from the combination than it ever was. Every brickmaker on this market is farther away from combination than ever. Brick are being sold at a ridiculously low price. Had the combination price been retained, no one would have been any the worse, and many in this community would have been better off for the advance. It is the old, old story. Sometimes it wins and sometimes it fails.

#### GOOD AND BAD BRICK PAVEMENTS.

During a talk with an extensive manufacturer of paving brick recently, the question was asked: "What is the reason so few pavers are going into the streets of Indianapolis?" We were obliged to reply that it is because, in the opinion of our municipal authorities, brick is not the best material to be used. Why this opinion? It is not that we are without good pavements in Indianapolis made of brick, but because we have a few which are bad. It seems to be one of the heritages of the brick pavement that everybody remembers failures of this material. With asphalt, wooden block and other paving materials this same heritage does not linger. In this community, when the question of brick pavement comes up, invariably reference is made to two particularly poor brick pavements. But in speaking of asphalt or wood blocks, equally poor and unsatisfactory pavements are seldom referred to. Despite the fact that a prominent residence street is now in a state of delapidation, demonstrating the unstable quality of wooden block, the property owners on that street have been asking for another pavement of that kind, and, but for the intervention of the mayor, the iniquity would have been repeated.

The poor brick pavements mentioned are very bad indeed.

The asphalt and block pavements mentioned were equally bad and even more expensive. Then why this difference in public thought? It is largely a question of the use of brains in influencing public officials and public opinion. The newspapers of this community have, so far as we know, never strenuously or seriously advocated brick pavements. They have advocated both wood and asphalt. Has this been because of the use of money or improper influences? We do not believe it, primarily because we believe it has not been necessary. The asphalt companies have employed in this city the brainiest kind of men to look after their interests—not in a practical, mechanical way, but in a business way. The Warren-Schart people have employed a gentleman, noted for his genial qualities, who in all probability gives the practical details no attention whatever, but he looks after public opinion and follows up the city officials. The result is that his material is now in the ascendancy in this community, and that, despite the record of failures, and there have been more bad asphalt streets than brick. Take the gentleman who has charge of the wooden block pavements. From mere force of ability of a business manager in this community within a reasonable time block pavement is sure to divide the business. What about brick? There appears to be no early prospect of brick being favorably thought of in this community, not because we haven't good brick pavements, for we have, but simply from the fact that there is no one here whose business it is to give brick a proper public representation. The brains which are in the brick business have gone into the making of brick, and not into the higher forms of business advocacy, and doubtless the same conditions we find here prevails in nearly all large cities.

#### EARLY RELIGIOUS ARCHITECTURE OF AMERICA.

This is a souvenir volume issued to the patrons and friends of the Cleveland Hydraulic Pressed Brick Company. It pictures missions and churches of America—examples of architecture, picturesque, beautiful, and of great historic interest, which had its development in Spanish-American territory. A part of this territory is now within our own domain. A souvenir volume of this character so sumptuous, so beautiful, of such historic interest, of such literary quality, and of such high artistic merit, certainly has never been issued to the trade of America. It reflects an artistic spirit, an ideal of the beautiful, which augurs well for the union of art in manufacturing in America. It is well to bear in mind, in this connection, that art and raw material make great value; that the union of the manufacturing instinct with the aesthetic and spiritual will bring us, as a nation, from a position where we are large importers of artistic products to one where we are yet larger exporters, and where our imports are very greatly reduced. The protection which we need for the benefit of our commerce is that which comes from the union of raw material with the skillful hand and the artistic mind. No one will question but that a concern which will issue a beautiful volume of this character will make beautiful brick. The artistic sense and discrimination which will lead them to place this work before their friends will also lead them to produce an artistic output.

#### AFTER A BIG GOVERNMENT CONTRACT.

John W. Sibley, of the Coaldale Brick & Tile Company, of Birmingham, Ala., has received a request from the government to bid on a quarter million vitrified brick, to be used in constructing the displacements for the big guns at Key West. The contract calls for the brick to be delivered at Pensacola, and on account of the nearness of Birmingham to that city, as compared with the brick works of the north, Mr. Sibley considers that the chances of his company's getting the contract are excellent.



Written for the CLAY-WORKER.

TO GATES.

HERE'S TO YOU, GATES. May your buttonhole still  
Survive to delight us and cheer us for years.  
Sad were our hearts when we learned you were ill;  
Gone is the sadness now, stilled our fears.  
Death is a conqueror, sickness will come ;  
Man is but mortal and buttonholes fray;  
Brief are the seasons allotted to some,  
Often the best are the first to decay.  
Age is not always the test to apply;  
Wear is more often the thing that impairs;  
Often the cheery note smothers a sigh,  
Sometimes the hopeful word issues from cares.  
Yours was the cheery note, always, dear Gates,  
Yours the brave, hopeful word spoken in time ;  
Often your button hole smiled at the fates,  
Hung for the thumb of the next man in line.  
Cares of your own you've no doubt had a few,  
Troubles and set backs and worries perhaps,  
But never a button hole aired them to view  
Except in the light of some funny mishaps.  
Lightly your button hole flapped in the breeze,  
Breezy and glad were the tales that it told;  
Wit and philosophy blended to please ;  
Surface of silver and heart of pure gold.  
Now that we feel you are with us again  
We'll lay for that button hole, fingers acrook,  
And your ears will be filled with our eager refrain  
"I say, Gates; I say, Gates," until we are shook.  
So fix up the button hole handy and strong,  
And knit up your frame for another long run,  
You're in for it, Gates and as this is no song  
You may reckon yourself in the length of the fun.  
So here's to you, Gates. May your button hole last  
When your last brick is made and your grandchild is wed.  
And you need but to take a brief glance at the past  
To guess what they'll say of you after your're dead.

THE CROAKER.

Joe Lincoln.

Once, on the aidge of a pleasant pool,  
Under the bank where 'twas dark and cool,  
Where bushes over the water hung,  
And rushes nodded and grasses swung,  
Jest where the crick flowed outter the bog,  
There lived a grumpy and mean ole frog,  
Who'd set all day in the mud and soak,  
And jest do nothin' but croak and croak.

Till a blackbird hollered, "I say, yer know!  
What is the matter down there below?  
Are you in trouble, er pain, er what?"  
The frog sez, "Mine is a orful lot;  
Nothin' but mud and dirt and slime  
Fer me ter look at jest all the time;  
It's a dirty world!" so the ole fool spoke,  
"Croakity-croakty-croakty-croak!"

"But yer lookin' down!" the blackbird said;  
"Look at the blossoms overhead,  
Look at the lovely summer skies,  
Look at the bees and the butterflies;  
Look up, ole feller. Why, bless yer soul!  
Yer lookin' down in a mus'rat hole."  
But still, with a gurglin' sob and choke,  
The blamed ole critter would only croak.

And a wise ole turtle, who boarded near,  
Sez ter the blackbird, "Friend, see here:  
Don't shed no tears over him, fer he  
Is low-down jest 'cause he likes ter be;  
He's one er them kind er chumps that's glad  
Ter be so mis'erable-like and sad;  
I'll tell yer somethin' that ain't no joke:  
Don't waste yer sorrer on folks that croak."  
—[Exchange.

When June with her warmth holds her sweltering sway,  
Then it's ho! for the country all summer to stay.  
But the farmers who hoe till they're blistered and brown,  
They'd like to quit hoeing and ho! for the town.  
—Good Roads.

TABLE OF CONTENTS.

|                                  |     |                                     |     |
|----------------------------------|-----|-------------------------------------|-----|
| Terra Cotta in Architecture....  | 495 | CORRESPONDENCE:                     |     |
| Clayworking in Denmark.....      | 498 | Button-Hole Talk.....               | 521 |
| Prospects for Good Business....  | 498 | Not Afraid of Spanish Shells...     | 521 |
| The Story of the Old Brick Fort  | 499 | Let Your Light Shine.....           | 521 |
| The Development of Hollow        |     | With the Brickmakers of Balti-      |     |
| Block Manufacture .....          | 501 | more.....                           | 522 |
| The Ceramic Association of the   |     | Good News from Alabama.....         | 522 |
| Ohio State University.....       | 504 | Light Ahead—Business Outlook        |     |
| The Diverting History of John    |     | as Viewed by a Chicagoan....        | 522 |
| Gilpin .....                     | 505 | What is a Fair Royalty?—The         |     |
| A Few Snap-Shots of a Virginia   |     | Village Brickmaker's View... 523    |     |
| Brick and Tile Works.....        | 506 | The Galesburg Pavers.....           | 523 |
| Modern American Front Brick      | 507 | The Situation in Chicago.....       | 523 |
| By the Light of the Kiln Fire—   |     | Philadelphia Pavers .....           | 524 |
| A Queer Story.....               | 509 | Canton Pavers.....                  | 524 |
| Painting Brickwork.....          | 510 | Purpose Essential to Success... 525 |     |
| A Voice From Texas.....          | 510 | Raw Clay Roads.....                 | 525 |
| Questions About Paving Brick     |     | Pacific Coast News .....            | 538 |
| Brick and How to Lay Them, 511   |     | EDITORIAL:                          |     |
| Anglo-American Pottery.....      | 512 | Current Comment.....                | 530 |
| Hints on Brickmaking .....       | 514 | Brick History.....                  | 531 |
| A Brick Factory in a Wooden      |     | Prompt Deliveries.....              | 531 |
| Town .....                       | 515 | Genuine and Imitation Fire          |     |
| The Challenge Conveyor.....      | 516 | Proofing.....                       | 531 |
| Making Marbles.....              | 516 | Wanted — Paving Brick Mis-          |     |
| From the Ashes .....             | 517 | sionaries.....                      | 531 |
| Brick Yard Property Brings a     |     | Local Agents for Paving Brick, 532  |     |
| Big Price .....                  | 517 | A Local Experience in Com-          |     |
| The New York Market.....         | 518 | bination.....                       | 532 |
| Endless Open Pan Conveyor... 518 |     | Good and Bad Brick Pavements        |     |
| The Use and Abuse of Clay-       |     | ments.....                          | 532 |
| working Machinery.....           | 519 | Early Religious Architecture of     |     |
| Too Generous by Far.....         | 519 | America.....                        | 532 |
| May Make Pavers.....             | 519 | After a Big Government Con-         |     |
| German Notes.....                | 520 | tract.....                          | 532 |
| Second Annual Contest for the    |     | Editorial Notes and Clippings, 536  |     |
| N. B. M. A. Scholarship.....     | 520 | MISCELLANY:                         |     |
| "The Simplest and Best Brick     |     | Read the Advertisements.....        | 506 |
| Machines.".....                  | 538 | Failed to Convert Clay Into         |     |
| American Imports and Exports     |     | Gold .....                          | 516 |
| of Brick and Clay.....           | 538 | To Gates.....                       | 533 |
| A Look Ahead.....                | 540 | The Croaker.....                    | 533 |

Index to Advertisements on Next Page.

**WANTED**—Situation as superintendent or general manager of a soft mud, still mud, or vitrified brick plant, by a thoroughly practical man, possessing executive ability. Has a knowledge of all machinery and can erect round and square down draft kilns.  
61 e Address, B. M., care Clay-Worker.

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Mailed, postage free, on receipt of price.

**T. A. RANDALL & CO.,**  
Indianapolis, Ind.



## INDEX TO ADVERTISERS.

## Brick Machinery—Dry Press Process.

| Name.                                     | Page. | Name.                                                               | Page. |
|-------------------------------------------|-------|---------------------------------------------------------------------|-------|
| Progress Press Brick and Machine Co. .... | 541   | The American Clay-Working Mach Co 543, 545, 546, 548, 550, 555, 557 |       |
| Ross-Keller Brick Machine Co. ....        | 492   | The Chisholm, Boyd & White Co. ....                                 | 488   |
| Simpson Brick Press Co. ....              | 489   | The Fernholtz Brick Press Co. ....                                  | 490   |

## Brick and Tile Machinery.

|                                        |               |                                                                      |          |
|----------------------------------------|---------------|----------------------------------------------------------------------|----------|
| Anderson Foundry and Mach. Works ..... | 557           | The Fate & Co., J. D. ....                                           | 563      |
| Baird and Son, H. C. ....              | 548           | The Huetteman & Cramer Co. ....                                      | 550      |
| Brewer, H. & Co. ....                  | 565           | The American Clay-Working Mach Co. 543, 545, 546, 548, 550, 555, 557 |          |
| Carlin's Sons, Thomas. ....            | 543           | The Horton Mfg Co. ....                                              | 559      |
| Central Machine Works. ....            | 542           | The Eastern Machinery Co. ....                                       | 566      |
| Chambers Brothers Co. ....             | 485, 556      | The Henry Martin Brick Mach. Mfg. Co. ....                           | 544, 561 |
| Chicago Brick Machinery Co. ....       | 491           | The Leader Mfg. Co. ....                                             | 556      |
| Freese, E. M. & Co. ....               | 564           | The Ohio Ceramic Engineering Co. ....                                | 486      |
| Frost Engine Co. ....                  | 493           | The Wallace Mfg. Co. ....                                            | 539, 567 |
| Hensley, J. W. ....                    | 487           | The Wellington Machine Co. ....                                      | 537      |
| Kells & Sons. ....                     | 548           | Williams Patent Crusher and Pulverizer Co. ....                      | 541      |
| Madden & Co. ....                      | 549           | Wiles Co., A. M. & W. H. ....                                        | 551      |
| Potts & Co., C. & A. ....              | 486, 534, 562 | Woolley Foundry and Machine Works. ....                              | 560      |
| Raymond & Co., C. W. ....              | 535           |                                                                      |          |
| Stedman's Machine Works. ....          | 551           |                                                                      |          |
| Steele, J. C., & Son. ....             | 551           |                                                                      |          |

## Brick Kilns and Dryers.

|                            |     |                                    |     |
|----------------------------|-----|------------------------------------|-----|
| Alsip, S. H. ....          | 552 | Phillips, S. G. ....               | 540 |
| Carson, J. W. ....         | 545 | Reppell, L. H. ....                | 552 |
| Eudaly, W. A. ....         | 554 | Swift, F. E. ....                  | 544 |
| Haigh, H. ....             | 553 | The American Blower Co. ....       | 568 |
| Kaul, C. F. ....           | 545 | The Fernholtz Brick Press Co. .... | 490 |
| Lehmann & Co, F. ....      | 553 | The Standard Dry Kiln Co. ....     | 494 |
| Morrison & Co., R. B. .... | 554 | Wolff Dryer Co. ....               | 568 |
| Pike, E. M. ....           | 545 | Yates, Alfred. ....                | 546 |

## Brick Yard Supplies.

|                                |     |                                              |          |
|--------------------------------|-----|----------------------------------------------|----------|
| Arnold, D. J. C. ....          | 558 | Phillips & McLaren. ....                     | 546      |
| Coldewe & Co., G. ....         | 542 | The Atlas Bolt & Screw Co. ....              | 543      |
| Carnell, Geo. ....             | 552 | The Harrington & King Perforating Co. ....   | 487      |
| Caldwell & Son Co., H. W. .... | 547 | The Henry Martin Brick Machine Mfg. Co. .... | 544, 561 |
| Carmichael, T. W. ....         | 547 | The Horton Mfg. Co. ....                     | 559      |
| Elder & Dunlap. ....           | 544 | The Pittsburg Mineral Screen Company. ....   | 544      |
| Marion Steam Shovel Co. ....   | 555 |                                              |          |
| Mey, F. H. C. ....             | 543 |                                              |          |
| Mershon & Co., W. B. ....      | 542 |                                              |          |
| Newton, A. H. ....             | 549 |                                              |          |

## Miscellaneous.

|                                             |          |                                       |     |
|---------------------------------------------|----------|---------------------------------------|-----|
| Associated Trade & Industrial Press. ....   | 548      | Indianapolis School of Medicine. .... | 547 |
| Bennett & Sayer. ....                       | 544      | Indiana, Decatur & Western ...        | 547 |
| Big Four R. R. ....                         | 549      | Illinois Central R. R. ....           | 548 |
| Cincinnati, Hamilton & Dayton R. R. ....    | 547      | Lake Erie & Western. ....             | 549 |
| Chesapeake & Ohio R. R. ....                | 549      | Main Belting Co. ....                 | 547 |
| Cotton Belt Route. ....                     | 549      | Monon Route. ....                     | 547 |
| Dean Bros. Steam Pump Works. ....           | 546      | Osborne, W. R. ....                   | 546 |
| Dover Fire Brick Co. ....                   | 548      | Royal Scribe. ....                    | 540 |
| Evens & Howard. ....                        | 542      | Sorge, A. Jr. ....                    | 545 |
| Gabriel & Schall. ....                      | 545      | Tennille, A. F. ....                  | 544 |
| Geysbeek, S. ....                           | 546      | The Jeffrey Manufacturing Co. ....    | 549 |
| Hay & Willits Mfg. Co. ....                 | 558      | The Rockwood Mfg. Co. ....            | 550 |
| Indianapolis College of Law ...             | 543      | The E. W. VanDuzen Co. ....           | 543 |
| Indianapolis Engraving and Electro Co. .... | 544, 550 | True, Arthur. ....                    | 540 |
|                                             |          | Vandalia Line. ....                   | 548 |
|                                             |          | Small Ads., Wanted, For Sale, etc.    |     |

Mention the Clay-Worker

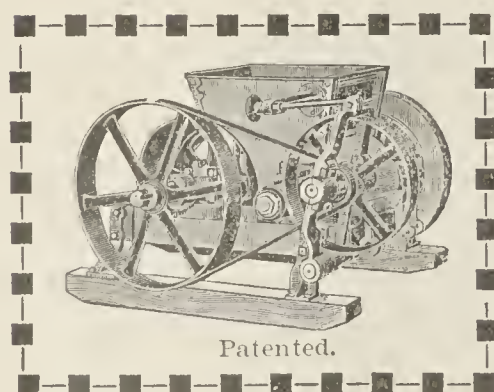
WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

## The Potts Disintegrators

Simple in Construction, Strong and Durable.

Work any clay direct from bank. They will not choke or clog. They grind the small stone and separate the large ones.



Milledgeville, Ga., November 4, 1897.

C. &amp; A. POTTS &amp; CO., Indianapolis, Ind.

Gentlemen:—For ten year I used one of your old style Disintegrators. it did good work early this year I had it changed to the way you now make them and it is simply perfect. My son uses one of your Disintegrators and without it he could not make first-class brick out of the clay he has to use. Every brickmaker who has hard clay to work should put in one of your Disintegrators, it does all you claim for it.

Wishing you much success I am

Yours truly,

J. W. McMILLAN.

We manufacture 12 sizes of Disintegrators and can furnish any size promptly. We guarantee them to do as claimed or no sale.

Write for prices and terms.

C. &amp; A. POTTS &amp; CO., Indianapolis, Ind.





# SIX MONTHS RECORD OF RAYMOND BRICK MACHINERY

## 20 COMPLETE PLANTS AND OUTFITS

of this famous machinery sold and placed in successful  
operation during that time.

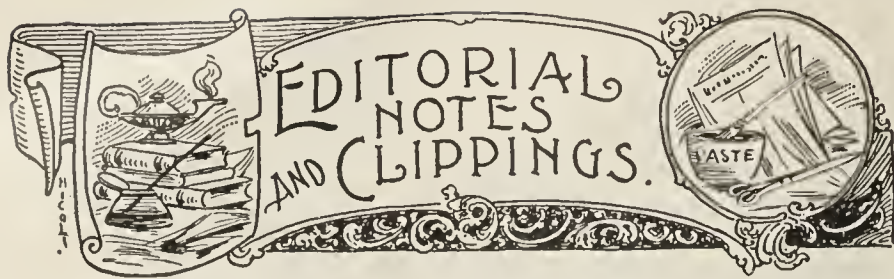
- Augusta, Ga. Outfit, 50,000 brick per day, with Automatic Cutter.
- Bolivar, Pa. Complete Plant, 50,000 brick per day, with Automatic Cutter and Re-presses.
- Toronto, Canada. Outfit, 50,000 brick per day, with Re-presses and Automatic Cutter.
- Opelousas, La. Complete Plant, 30,000 brick per day.
- Kingston, Jamaica. Complete Plant, 30,000 brick per day with Re-presses.
- Lewiston, Pa. Outfit, 30,000 brick per day.
- Cumberland, Md. Complete Plant, 40,000 brick per day, with Re-press.
- Vanport, Pa. No. 1. Outfit, 50,000 brick per day, with Re-press and Automatic Cutter.  
No. 2. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Doniphan, Mo. Outfit, 30,000 brick per day.
- Punxsutawney, Pa. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Cassadaga, N. Y. Outfit, 30,000 per day.
- Sieglingville, S. C. Outfit, 25,000 per day.
- Thomas, Alabama. Complete Plant, 50,000 per day, with Re-press and Automatic Cutter.
- Pittsburgh, Pa. No. 1. Outfit, 50,000 per day with Re-presses and Automatic Cutter.  
No. 2. Outfit, 50,000 per day, with Re-press and Automatic Cutter.
- Edenberg, Pa. Complete Plant, 30,000 per day, with Re-press.
- Mexico City, Mexico. No. 1. Outfit, 30,000 per day.  
No. 2. Complete Plant, 50,000 per day, with Automatic Cutter.
- Abbeyville, Ga. Outfit, 25,000 per day.

COULD A BETTER  
TESTIMONIAL BE OFFERED?



C. W. RAYMOND & CO., DAYTON, OHIO.





Chas. W. Palmer will start a brickyard at Bristol, Tenn.

A tile factory has been started at McKinley postoffice, Blount Co., Tenn., by Wm. Razor.

Jno. Price and J. K. Gunning have purchased the brick and tile factory at Industry, Ill.

Daniel Mullen has purchased land at Ashland, Me., and will open up a brickyard in the very near future.

Geo. Snyder, of Hamilton, Mo., has leased a tract of land at Braymer, on which he will start a brickyard.

A correspondent from New Ulm, Minn., writes that the demand for brick in that section is very brisk.

Swift & Gragg have purchased the tile factory at Waverly, Ill., and will at once put same in condition for operation.

Theodore M. McKnight has purchased the retail business of Costello & Neagle sewer pipe manufacturers at Elmira, N. Y.

In renewing his subscription J. H. Blythe, Monticello, Ark., says he desires to purchase a hand brick press, and would like to receive catalogues, etc.

The Gaffney Brick Co., of St. Louis, has purchased the property of the Winchester Brick Co., at Winchester, Ky, and will make extensive improvements in same.

The Frontier Brick Co., of Niagara Falls, N. Y., has been incorporated by A. Schoellkopf, J. B. Vogt, E. M. Clark and others, with a capital stock of \$20,000.

Damage to the extent of \$2,000 was caused by fire at the plant of the Mechanicsville (N. Y.) Brick Co. May 30. The loss has been repaired and work resumed.

Jno. W. Frid, the well-known brick manufacturer of Hamilton, Ont., Canada, died at his home in that city May 20. Mr. Frid had been ill a month or more with typhoid fever.

J. C. Houck, who recently purchased the Chenoa (Ill.) Brick and Tile Co. from our friend E. M. Pike, has in turn sold a one-half interest in same to A. Steinbarger of Ligonier, Ind.

Jos. Hatch, a member of the well-known brick manufacturing firm of Hatch Bros., of Camden, N. J., died in West Philadelphia, Pa., June 3. He leaves a widow and three children.

The Mattoon (Ill.) Brick and Tile Works have opened up again, with all the new machinery in motion, and is now one of the best equipped brick and tile plants in Southern Illinois.

J. B. Rockwell and C. H. Forey, of Lexington, Ky., are considering the advisability of moving their brick plant to Parkersburg, W. Va. The people of Parkersburg will offer \$20,000 bonus.

Felix Chillingworth, trustee of the Charter Oak Brick Co., of Hartford, Conn., has sold the plant to Frederick Broeckett and H. L. Thorp, New Haven, and Geo. H. Todd, of Hamden, for \$20,000.

The San Francisco Brick Co. has been incorporated at San Francisco, Cal., by C. F., M. F. and H. N. Gray, Clayton Bennett and F. Ames, all of that city, with a capital stock of \$500,000.

James Moore, a terra cotta manufacturer at Eldora, Ia., died there the 26th of May, from the effect of a paralytic stroke. Mr. Moore was formerly a resident of Wellsville, O., where the body was taken for burial.

The Sedalia (Mo.) Building & Paving Brick Co. has been incorporated with a capital stock of \$4,000. A. W. Winzenberg, W. J. Upton and Mrs. Anna Bernsch are interested. They will manufacture brick, earthenware, pottery, etc.

The death of Wm. W. Fell occurred at his home in Trenton, N. J., June 3. Mr. Fell had been in the brick business for many years, being at one time in business with his brother, the late Peter Fell. He leaves a widow and two children.

Reese, Hammond & Co., of Bolivar, Pa., one of the largest fire brick manufacturers in the United States, has just added to their new plant one of the Hercules fire brick machines, for making all kinds of fire brick shapes, and grate tile as large as 16x32 by the soft mud process. The Hercules machine

is manufactured by the Horton Manufacturing Company, Painesville, O., one of the largest manufacturers in the United States of soft mud machinery and brick yard supplies.

A subscriber, writing from North Dakota, says: "The brick made about Grand Forks are common bricks, soft-mud process, and sell from \$6.50 to \$7.50 per thousand. The building outlook is excellent, and all brickmakers are rushed with orders."

Philip Kennedy, of Scranton, Pa., and C. M. Elting, of Philadelphia, will erect a large paving brick plant at Exeter, Pa., where Mr. Kennedy owns a large tract of fine clay land. A company has been organized with a capital stock of \$250,000.

A storm which swept over the city of Quincy, Ill., May 19, did a great deal of damage to the plant of the Gem City Paving Brick Co. The entire plant was flooded to a depth of three feet. The greatest damage occurred in the drying department.

The National Web Tile Sewer Co., of Syracuse, N. Y., report that their product, of which mention was made in the Clay-Worker sometime since, is meeting with, as they put it, "phenomenal" success on all sides, and is now in great demand.

The brick works of the Illinois Supply and Construction Co., at Collinsville, Ill., were destroyed by fire Sunday morning, May 30. The loss is estimated at \$30,000. The company's office is in St. Louis. They will, in all probability, rebuild without delay.

The Natchez (Miss.) Brick Co. has been fully organized, and a plant has been established for the manufacture of building brick. The officers are R. E. Bost, president; R. L. Parker, vice-president; Dr. B. D. Watkins, secretary, and E. C. Edmiston, manager.

Drake & Morgan, who so recently started a new brick plant at Trenton, N. J., have everything running in first-class order, and have just opened their first kiln of brick, and are very much pleased with same. They are turning out a very fine grade of buff brick.

The plant of the Gay Head Brick Co., at Chelsea, Mass., was damaged to the extent of \$50,000 by fire, May 27. All the machinery was totally destroyed, and the buildings very nearly so. The loss is partly covered by insurance. The factory will probably be rebuilt.

The brick and tile works owned and operated by Chas. Hull at Lacey, Ia., were completely destroyed by fire recently. The origin of the fire is not known, but it is thought to have been caused by lightning, as a fierce storm was raging at the time. Loss is estimated at \$3,000.

The plant of the Union Brick Co., at Versailles, a little station near Pittsburg, Pa., was totally destroyed by fire May 30. The origin of the fire is not known. The loss is estimated at \$10,000. The company's main office is in Pittsburg. The plant will probably be rebuilt.

Frank Harper, of West Union, W. Va., writes that he is starting a brick plant at that point, and wants a complete equipment of soft-mud machinery, clay crusher or disintegrator, mould sander and fixtures for steam power. He expects to make about 15,000 daily.

The Linn Grove Brick & Tile Co. is the name of a new corporation organized at Linn Grove, Iowa, this spring for the manufacture of brick and tile. They at once began the erection of a plant, and are now burning their first kiln and expect to have a fine grade of common builders.

Westermain & Boehm is the name of a new firm that will erect a brick manufacturing plant at Montowese, Conn. At the start they will make common brick only, but later on expect to turn out front and ornamental brick and roofing and drain tile. The plant will be equipped with new and improved machinery.

The Campbell Brick Co., of Ithaca, N. Y., manufacturers of paving, buff and ornamental brick of all shades, have just placed in their works, at Newfield Station, a New Haven soft-clay brick machine. Any brickmaker happening in the vicinity of the Campbell Brick Works will be well repaid for the time spent in a visit to the factory.

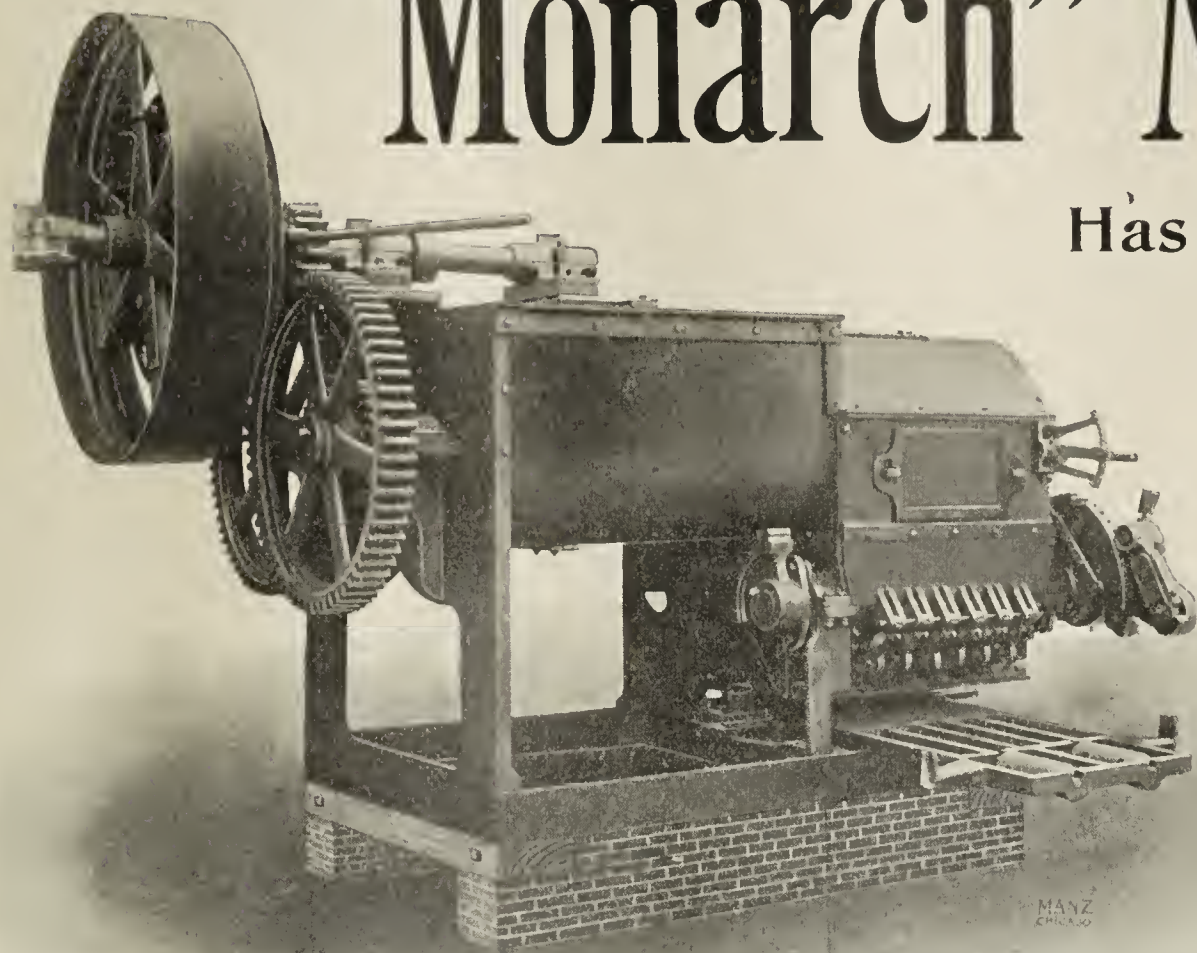
The plant of the Alton Paving, Building and Fire Brick Company, at North Alton, Ill., was shut down a day or two recently because of a peculiar circumstance. The shale used in making the brick is mined with steam shovels from a depth on a level with the coal measures. While a steam shovel was at work it dug into an abandoned coal pit that had been filled with water for many years. The mine that was opened was con-

[CONTINUED ON PAGE 538.]



FOUR STYLES OF.....

# "Monarch" Machines



Has Double Pug Mills,

Giving the most tempering capacity of any Machine made.

Double Presses

Giving the most pressing capacity of any machine made.

Presses

Are "all in the mud," thereby eliminating all unnecessary friction and wear.

❖ ❖ ❖

These and other MOST IMPORTANT points which are

IN NO OTHER.

## The "Iron Quaker" Machines

For 1898 are BETTER THAN EVER.

This cut shows the steam power in connection with our Mould Sander.

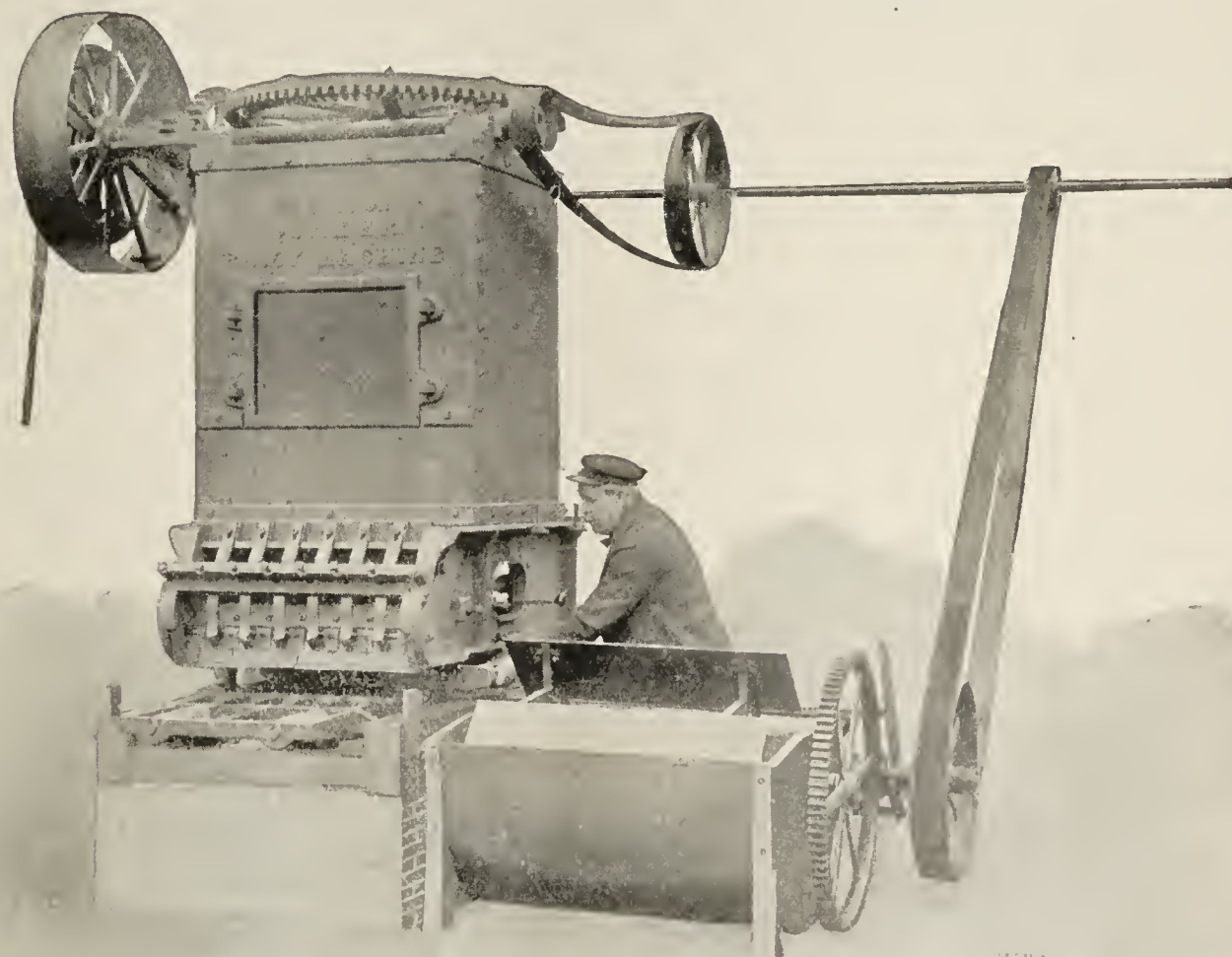
## Our Horse-Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

## Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE. At Bargain Prices.

Odd sizes of moulds. Have not been used.

20 moulds, 8 13-16 x 4 3-16 x 2 7-16. 9-16 in. partitions.  
2 moulds 9x4 1/8 x 2 5/8. 9-16 inch partitions.  
3 hand moulds (3's) standard size.

Second-hand, but used a few days only.

10 moulds, 9 1/2 x 4 9-16 x 2 3/4. 1 1/2 inch partitions.  
19 moulds, 9 1/2 x 4 5/8 x 2 9-16. 1 1/2 inch partitions.  
16 moulds 9x4 1/2 x 2 1/4. 9-16 inch partitions.  
19 moulds, 9 x 4 3/8 x 12 1/2.

The Wellington Machine Co.,  
WELLINGTON,  
OHIO.

Send for Circular.



## EDITORIAL NOTES AND CLIPPINGS.—Continued.

nected with a series of mines of the same character, and a deluge of water poured into the shale pit, filling it to a depth of about 16 feet. The old shale pit must be abandoned, as pumping out the flood of water would be too expensive to be profitable.

A. A. Winslow, of the firm of French & Winslow, stove lining manufacturers, was found dead in his stable on the morning of June 8, with a big hole in his chest and an empty shot gun by his side. It is supposed the gun was accidentally discharged, as Mr. Winslow was in good circumstances, and there was no apparent reason why he should commit suicide.

In a recent letter J. U. Shackelfords sends in his renewal order and asks that his address be changed, as he has sold his brick and tile factory at Maxwell Ia., and is building a new plant at North Des Moines, Ia., putting in an E. M. Freese brick machine and a dry pan from the Des Moines Manufacturing and Supply Co. He says he expects to be making brick by the middle of June.

On May 12, C. G. Reese, of Elizabethtown, Pa., and Miss B. F. Wiers, of Baltimore, Md., were quietly married in the latter city, and went at once to their own new home in Elizabethtown. Mr. Reese is a prominent brick manufacturer of that city, and a faithful member of the N. B. M. A. We know his friends in the association will join with us in wishing the young couple all kinds of prosperity and long life.

## PACIFIC COAST NEWS.

THE PRESS BRICK and terra cotta business is in a quiet state and, as a representative of Gladding, McBean & Co. said, the immediate prospects are not very encouraging. Common brick is in large demand because there are quite a number of buildings going up that require such material. A late rain has brightened things up considerably.

Work was begun at the Pleasanton, Cal., brick yards last week, and everything was getting along nicely, until it began to rain. Until the yards dry out very little work can be accomplished. Over 140,000 green brick were ruined by the showers.

Mitchell Brothers have about completed the burning of a kiln of 150,000 brick, at Ventura, Cal., which will be used at once in the substantial warehouse to be erected by Fred Baker and others.

The sheds and buildings at Thompson & Sons' brickyards, between Fortuna and Rohnerville, Cal., have been destroyed by fire.

Owens & Smith are burning a kiln of 100,000 brick near Forest Center, Wash. The clay in that vicinity is pronounced by experts to be fully equal to the Clayton material.

As a result of the demand for brick for building purposes, William Stevens, of the Palous Pottery Company, has decided to start a brickyard at Kendrick, Idaho. A large sum of money has been sent from Kendrick for brick every year, and this will now be spent at home. A bank of white clay has been found and lime is being burned on the Clearwater.

Keek & Bird, brick manufacturers, are reported starting at Republic, Wash.

The new brickyard in South Yuma, Arizona is being run by Phoenix parties, and is turning out an excellent article of brick. About 40,000 are now ready to burn. The clay used is of a superior quality.

About 50,000 brick in McClellan's brickyard at Windsor, Cal., were ruined by the recent rain.

Five hundred thousand brick are now being burned at the yards in Anaheim, Cal., for the new high school to be erected there.

At a recent meeting of the Bricklayers' Union of Portland, Oregon, a resolution was adopted to the effect that the dues of all the members who have gone to the front in the war would be kept paid up until their return, and furthermore, that after they come home they would receive a card free of charge.

State Mineralogist A. S. Cooper reports the yield and value of the mineral substances of the State of California for 1897 as follows, according to returns received at the State Mining Bureau in answer to inquiries:

|                                   |           |
|-----------------------------------|-----------|
| Clay—Brick, 97,468 M.....         | \$563,240 |
| Pottery, 24,592 tons.....         | 30,290    |
| Slate, 400 squares.....           | 2,800     |
| Sandstone, 77,000 cubic feet..... | 24,080    |

The total value of all the substances for the year is \$25,142,441. In 1896 the total value of the mineral product of the State was \$24,291,398, and in 1895 it was \$22,844,664.

P. L. Pickering & Co., brick manufacturers, will start a yard at Paso Robles, Cal.

The Remillard Brick Company, of Oakland, Cal., will resume operations shortly at their Pleasanton, Cal., yards, with a force of 150 men. Many large orders are on hand, and a long run is expected.

SUNSET.

## "THE SIMPLEST AND BEST BRICK MACHINE."

The following letter from one of Tennessee's best-known brickmakers speaks for itself. The Hercules is pictured on page 559 of this magazine. The manufacturers will be delighted to send similar letters of commendation to any reader of the Clay-Worker who wants information as to improved brick machinery and appliances.

Horton M'fg. Co., Painesville, Ohio:

Gentlemen—Thinking that you would like to know how the "Hercules" machine, recently purchased of you by this company, is working, will say, that I am pleased to inform you that the machine is doing good service, we have made nearly a million of brick per month, and the machine is working nicely. "The more we work it the better we like it." If there is any one in this section of the country who wishes to see it work you can send them along and I will guarantee they will go away perfectly satisfied that the Hercules machine is the best in the country.

The man who designed this machine certainly hit upon the right principle and seemingly burned all bridges behind him, and the chances for improvement do not seem possible and retain the simplicity in the marked degree which is shown.

I have been a brickmaker all my life and for the past 27 years I have been operating various machines, and I say frankly that the Hercules is by all odds the simplest and the best machine I ever saw. The mold device is simply perfect. The capacity of the machine is limited only by the party operating it. It seems to make all the brick that can be taken away from it. We frequently make four thousand an hour. It is the lightest running machine I ever saw. No trouble in slipping belts. I would rather pay \$1,000.00 for this machine than to have nine-tenths of the other machines as a gift.

Yours truly,  
Memphis, May 14, '98.

HARRISON McCUE,  
Supt. Tennessee Brick Co.

## AMERICAN IMPORTS AND EXPORTS OF BRICK AND CLAY.

The following exports and imports of bricks and clay have just been completed for the month of February, the latest period for which the official figures have been compiled by the Treasury Department.

The amount of building brick exported amounted to 163 M., valued at \$1,204, as compared with 315 M. last year, valued at \$1,958. The total for the eight months amounted to 2,581 M., valued at \$17,262, as against 3,612 M. last year, valued at \$18,762.

Fire brick was exported to the value of \$10,230, as against \$4,189 as compared with the exports of the eight months which were valued at \$76,327 during February, 1898, as against \$78,323 worth in 1897.

The dutiable imports of clay for the month amounted to 7,944 tons, valued at \$53,913, as compared with 6,101 tons last year, which was valued at \$41,756. The total during the eight months amounted to 67,911 tons, valued at \$469,079, as against 59,405 tons last year, valued at \$427,562.

The dutiable re-exports of clay amounted to 42 tons, valued at \$241, as against nothing the year before. The total for the eight months amounted to 43 tons, valued at \$255, as compared with 21 tons, valued at \$21 the year before.

## LAKE VIEW HOTEL,

Lake Maxinkuckee (Culver), Ind.,

Will reopen on June 20, 1898, for the summer season, with improved service and thoroughly modern appointments. Family accommodations a specialty. Rates reasonable.

Address J. B. Schofield, Manager, Culver, Ind.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

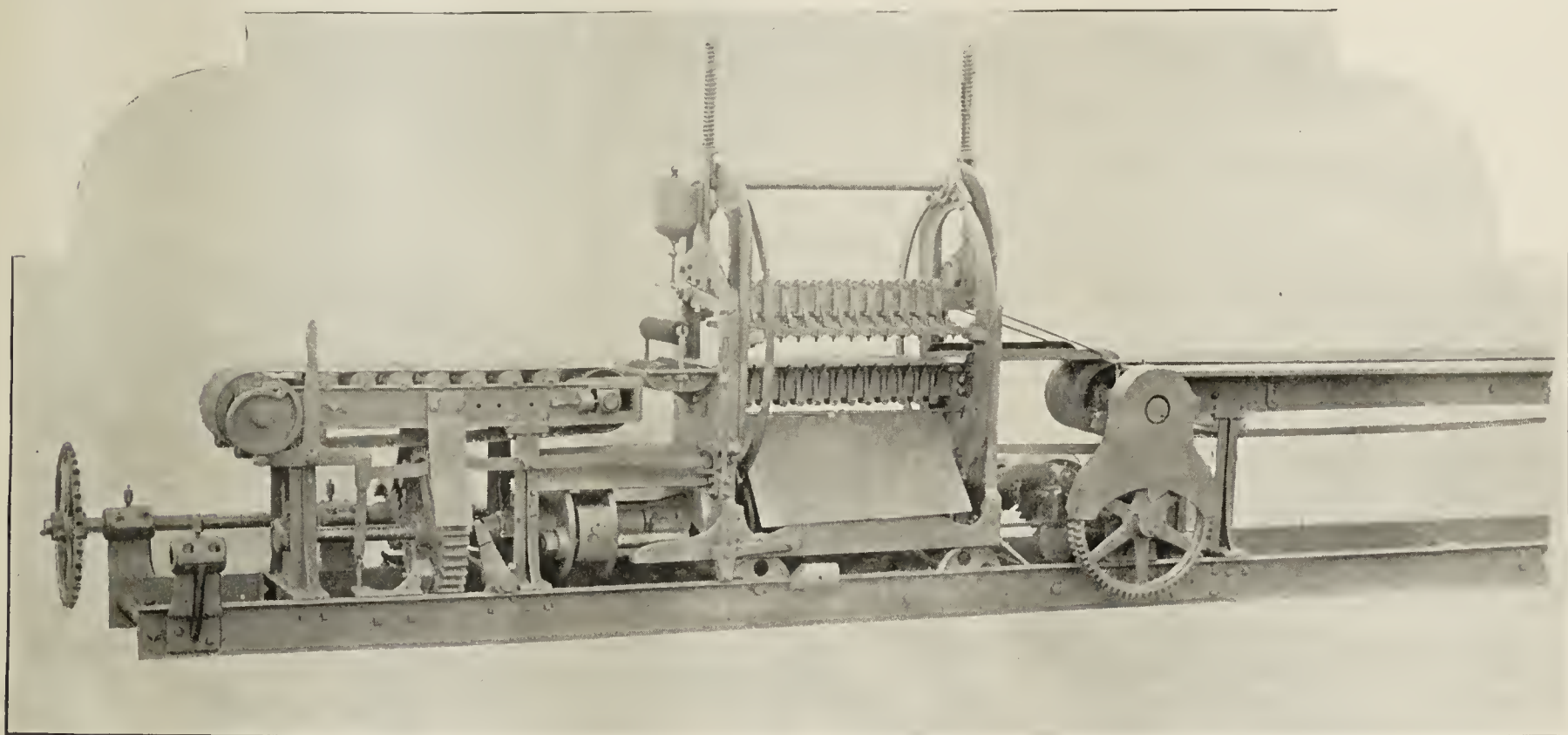


CUNNINGHAM'S IMPROVED COMBINED

# Automatic Cutting Table,

*Cuts Both Side and End Cut Brick.*

THERE is no branch of the clay working machinery business that has acquired more thought and expenditure of money than has the Automatic Brick Cutters, the result of which is, there are many good Automatic Cutters that will cut either end or side cut brick, but until we presented our improved Combination Cutter to the trade there was none that would cut both, therefore, we feel justified in claiming priority.



## Points of.... Advantage:

COMPACT, SIMPLE, DURABLE and ACCURATE.

No swelling of the bar of clay.

Will work in connection with any make of machine.

Has capacity of from 1 to 200 brick per minute.

We cut both end and side cut brick with one table.

Clamping the bar of clay improves it instead of sticking to it.

Only four feet of clay between the Cutter and the brick die.

The bar of clay is held firm while it is being cut, which insures perfectly straight cut brick.

Made of iron and steel, high grade workmanship; Friction reduced to a minimum by anti-friction bearing.

Only 10 brick beyond the last one cut, which prevents them from sticking together.

Clamping the bar of clay on the top and on the bottom strengthens and and smoothes the surface giving the brick the appearance of pressed brick.

The wires have a sheering action, being set on an angle which prevents ridged and feathered edges on the face of the brick.

No machinery driven by the registering belt, which overcomes the annoyance of the bar of clay sticking to the belt and marring the bottom of the brick.

The wires pass up at one stroke and down at the next, which overcomes the sliding of the bar of clay from one side to the other.

It Does Perfect Work. Write for Descriptive Circular.

## Wallace Manufacturing Co.,

CHICAGO AGENTS:  
Chicago Brick Machinery Co., Chicago, Ill.

FRANKFORT, IND.



## A LOOK AHEAD.

The sale of drain tile in many parts of the country this season has been very encouraging, and the outlook for business has been very much improved. Tile manufacturers should see to it that a sufficient supply for the coming season is provided for. Tile are not so easily or cheaply made when it rains frequently and the atmosphere is saturated with water. The tile dry slowly and more labor is required to handle them, and if the business is pushed it will require more drying room.

Those who depend upon the air to dry their tile will find it a slow business, but persistent effort will find a way to success.

Again we urge tile manufactures to stock up with tile. If we have two or three wet seasons there will be a great deal of draining done.

The prices of farm products are good and farmers will soon have money to pay for tile, and then there will be less higgling about prices. If you have been selling tile too low, advance the price, and then tell your trade why, and in the future stick to prices that will pay a fair return for labor. The men who want a right margin for profit may rise to the point that will pay handsomely, but the man who does not put his business upon a paying basis cannot succeed, let him make ever so great an effort.

There is such a thing as allowing ourselves to drift in our business, we can hardly tell why. But there is such a thing as "tact," and tact seizes the opportunity and leads on to success.

Again we say, stock up your tile yards and be ready for the trade.

## FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

**FOR SALE** — One three-mold Boyd dry press brick machine, or will rent same, with kilns and all necessary machinery. For particulars address  
SUFFERN & LONGMUIR.  
61 cm. Coal City, Ills.

**WANTED** — Position as burner or engineer, experienced in fire, press, paving and building brick, up or down draft kilns. First-class with fuel oil. References.  
CRUDE OIL,  
611 pm. Care Clay-Worker.

**WANTED** — A thoroughly competent man to supervise the burning of street paving brick. The works are located on the island of Jamaica, West Indies. Give references and state salary expected. Address,  
E. M. FREESE & CO.,  
61 d. Gallon, Ohio.

**FOR SALE AT YOUR OWN PRICE** — One improved Acme Frey-Sheckler brick machine, nearly new, with end cut-off table. Also one Frey-Sheckler side cutting-off machine; one Quaker brick machine, molds, etc., complete; one Penfield double plunger brick machine; one 35 H. P. Westinghouse engine; one No. 2 Dean Bros. boiler feed pump. The above are in good condition and must be sold at once. Also one 6 H. P. Peerless engine and boiler complete  
THE CAPITAL IRON WORKS,  
61 cm. Topeka, Kans.

## BRICK YARD PLANT

**FOR SALE AT A BARGAIN.** For particulars, address  
WILLIAM O. AMES,  
61 cm P. O. Box 475, Tallahassee, Florida.

**FOR SALE** — By order of Court — Complete brickmaking plant of W. C. Hill Estate, now running at good profit, nineteen acres of land one mile from postoffice, Seattle, Washington. Price \$30,000. Address  
WILLIAM H. LEWIS, Administrator,  
611 pm P. O. Box 52, Seattle, Wash.

**WANTED** — Situation as Superintendent or foreman by man experienced in the manufacture of fire, paving, press and building brick, understands up and down-draft kilns; capable of constructing new plants. Reference.

FIRST-CLASS, Care Clay-Worker.  
611 pm.

**FOR SALE** — One 25 H. P. boiler, one 9 by 14 engine; 5,500 wood pallets, ½ by 10 by 33; one Kells brick and tile machine; one New Quaker brick machine; one Potts disintegrator; one Potts brick mold sander; three dump carts. All in good condition, and will sell cheap. Address,  
61 cm. MECHANIC, Care Clay-Worker.

**WANTED** — By an experienced enameiler, a position with a firm of first-class standing. Every proof of ability given. Address  
62 cm. COPE, Care Clay-Worker.

**WANTED** — One or two second-hand storage tanks, 150 to 200 barrels capacity, or information as to where same can be obtained. Address  
MONMOUTH POTTERY CO.,  
61 d. Monmouth, Ills.

**FOR SALE** — Entire lot of machinery for manufacturing brick and tile. One one hundred H. P. engine; one dry pan, capacity 50 tons; one wet or mixing pan, capacity 50 tons; one steam press (Bruner make), capacity 10,000, with dies from 3½ to 18 inches; one E. M. Freese & Co. brick table; one Dean Bros. force pump; one 40 H. P. boiler and a lot of shafting and pulleys; 60 rods of tramway and four dump cars. All in good order. Address,  
W. G. WILSON, assignee of Barber Bros.  
63 cm. Lostant, Ills.

## A Foreign Market for Clayworking Machinery IS A PROFITABLE MARKET.

A Special Engineer familiar with the field desires the agency for a full line of Clayworking Machinery and appliances, Fire Clay Products, etc. Can speak French, German and Russian and has a large acquaintance in those countries. Will cheerfully give information as to best shipping routes, prevailing prices, method of delivery and superintend the erection and operation of plants. Correspondence solicited. Address

ROYAL SCRIBE, care Clay-worker, Indianapolis.

## The Best Brick Drier



Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the Phillip's Fan Dryer will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The PHILIP'S DRYER is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS Agent and Patentee, 161 Grand Street, Rahway, N. J.



Arthur True,

39 East 28th St.,  
NEW YORK.

Dealer in....

Antiques,

Rare Old Furniture,

English Mantel Clocks,

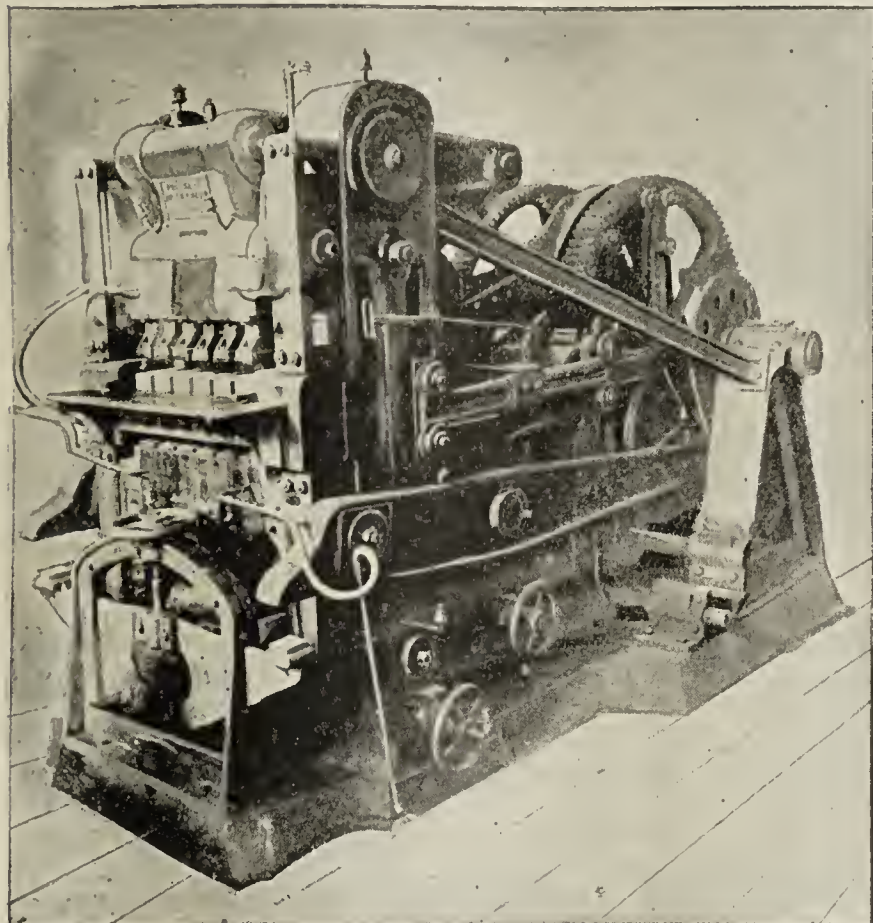
Old Prints and Paintings,

Old Jewelry and Curios.

Also, Fine Collection American Historical Blue Plates.



# The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

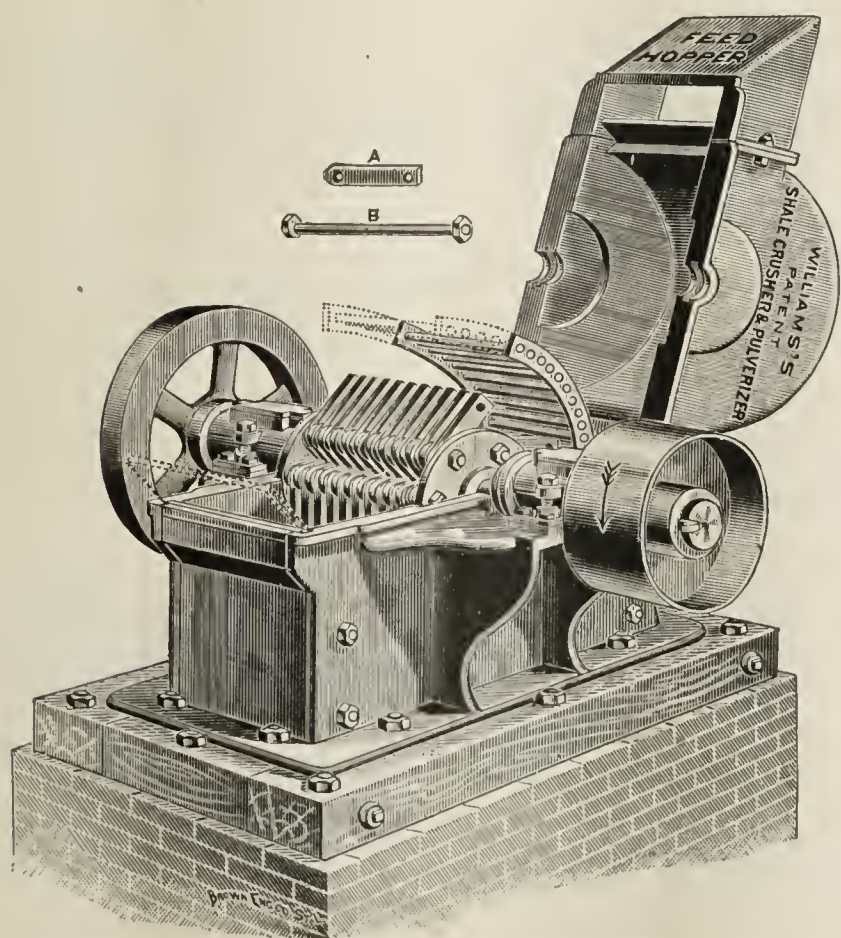
Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE  
ON APPLICATION. . . . .

**Progress Press Brick and Machine Co.,**  
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**

## WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

A Clay Pulverizer of Wonderful Capacity.



Williams's Shale and Clay Pulverizer.  
With Clay Steamer Attached.

Our Pulverizer is Fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.

Office of HYDRAULIC PRESS BRICK CO.

St. Louis, Mo., October 30th, 1897.

MILTON F. WILLIAMS, Esq., City.

Dear Sir;—Enlosed please find our order No. 125 for one No. 2 Pulverizer. In a few days, or as soon as our drawings are completed, I expect to give you an order for two more. We have three of your Pulverizers now running, giving perfect satisfaction. We are able to grind clay to any degree of fineness by making very slight changes in the machine. They have been running several months without repairs worth considering.

Yours truly,  
HYDRAULIC PRESS BRICK CO.,  
W. N. Graves, Gen'l Supt.

HOTEL BERNARD, Wagner, Ind. Ter.

WILLIAM'S PATENT CRUSHER AND PULVERIZER CO.,

Dear Sirs;—The Pulverizer we bought of you sometime ago is a dandy, we would not exchange it for any grinder we know of. Keeping it in repair costs nothing to speak of. Wishing you every success, we are

Yours respectfully,  
TAYLOR & RAINS.

These machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known. Will guarantee them under any and all circumstances.

**The WILLIAMS PATENT CRUSHER & PULVERIZER CO.**

2705 North Broadway, St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.



**FOR SALE.**—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 1 tf d JESSE T. MORGAN, Wilkes-Barre, Pa.

**NO DRY PRESS BRICK PLANT** complete without the Carmichael Clay Steamer. T. W. CARMICHAEL, Inventor and Manufacturer, Clarksburg, W. Va. 6 tf d

**FOR SALE**—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN, Room 13 Palmer House, Chicago, Ill. 3 t f d

**WANTED**—Situation as Superintendent or Foreman of brick works. Practical in every detail. No. 1 burner, up or down-draft kilns, dry or stiff clay process. Address SUCCESS, 6 tf 125 P. Care of Clay-Worker.

**FOR SALE**—A complete pottery and brick plant, located in a growing city of 18,000 population. Railroad facilities good. Five roads with prospects for another. Good home and shipping trade well established. Fine clay and plenty of water. Prices and terms reasonable. For particulars address Box 375, Meridian, Miss. 6 l dm.

**FOR SALE CHEAP.**—One Second-hand, double die Columbian Repress; practically as good as new. One Quaker Horse-power Brick Machine, in good order. One Monarch Brick Machine, only used one short season. All in running order. THE HORTON MFG. CO., Painesville, Ohio. 1 tf L.

**FOR SALE**—Brick and tile plant in the South; R. R. switch to kilns, soft and stiff mud machines, Sharer dryer. Clay good for front brick and fire proof wares. Growing market from wide and prosperous territory. Will sell entire plant, or machinery alone. Will sell part interest with management to right man. Address G. P. ORENDORFF, Lacon, Morgan Co., Ala. 4 tf 5p

**FIRE BRICK MANUFACTURERS** desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address SUPERINTENDENT, care Clay-Worker. 4 l d

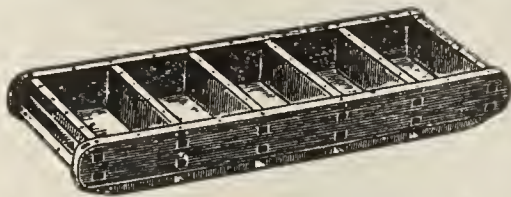
**FOR SALE**—Street-paving brick plant, situated at Peoria, Ill., a city of 60,000 inhabitants. This city has adopted brick almost exclusively and have the season's work yet to be done. This plant has been in successful operation for five years and the brick have stood all tests. It has an inexhaustible supply of shale clay, an abundance of water, and coal bank adjoining factory. Shipping facilities unsurpassed. Owing to the death of the two principal stockholders within the past year, and to settle their estates, this property is offered for sale. Here is a bargain for some one. SPURCKS STREET-PAVING BRICK CO. 6 l 1 pm. Peoria, Ills.

**FOR SALE**—Fire clay property and factory site; 2,500 acres within six miles of Baltimore, Md., a large part underlaid with clays of fine quality and great variety, suitable for making red, buff and other kinds of brick, tiles and terra cotta. Railroad through property connects it with Baltimore and Washington. Water connection with Baltimore and Chesapeake Bay by channel 15 feet deep. Good water power on property. Fine site for factories. Parts of property are suited for suburban development and parts for truck farming. For sale as a whole or in lots to suit, on reasonable terms. Also a small factory equipped for making roofing tiles and brick. Address CURTIS CREEK M. F. & M. CO., 12 St. Paul St., Baltimore, Md. 5 6 cm

**PRESS BRICK PLANT FOR SALE OR LEASE.**

Complete. Daily capacity 15,000. Good condition. Good opportunity for active parties. Terms easy. Located in the Central part of Pennsylvania. Address "JOHN," 43 c care Clay-Worker.

## G. COLDEWE & CO.,



MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and... MACHINE **MOULDS**

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

## FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

**Sewer Pipe all Sizes.**

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

**EVENS & HOWARD,**  
920 Market Street, - - - ST. LOUIS, MO.

## CENTRAL MACHINE WORKS

MANUFACTURERS OF

**J. N. K. Brick Machines and  
P. L. Sword Brick Machine,  
Pug Mills and Clay Crushers.**

With our improved machines a superior quality of building brick can be made with less outlay of labor and capital than by any other method. The J. N. K. Machine makes a fine front brick as cheaply as other machines make common brick. Full particulars for the asking.

**J. N. KAUFHOLZ,** Proprietor and Patentee,  
226-236 Abbey Street, CLEVELAND, OHIO.

# For Sale....

5,400 white pine pallets, 33 $\frac{3}{4}$  inches long, 10 inches wide, tops of four pieces  $\frac{7}{8}$ -inch thick, with three cleats 1 $\frac{1}{2}$ x $\frac{7}{8}$ -inch nailed on with wire nails, entirely new and first-class. Will be sold cheap if ordered at once.

**W. B. MERSHON & CO.,**  
Saginaw, East Side, Mich.

MENTION THE CLAY-WORKER,  
WHEN WRITING TO ADVERTISERS,  
MENTION THE CLAY-WORKER.



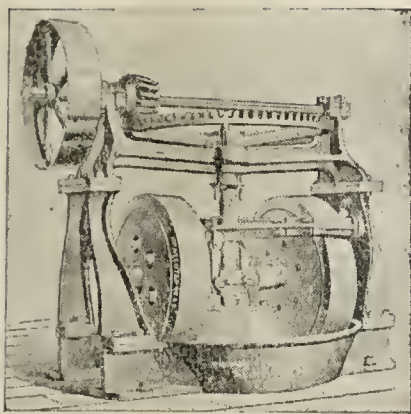
# BRICK CARS and TRUCKS

Of Any and All Kinds.  
**Easy Running. Light yet Strong.**

Don't fail to get our prices. Catalogue free.

**THE ATLAS BOLT & SCREW CO.,**  
Cleveland, Ohio.

## CARLIN'S DRY PANS are



Stationary Wet Pans.

THE BEST and in the long run the cheapest Dry Pans on the market. They are the cheapest because they are the best. Carlin's Dry Pans are built for service and capacity. Ask those who are using Carlin's Dry Pans and they will tell you they are the best and cheapest pans made. We make several different sizes. If you are going to buy a Dry or Wet Pan and want the best value for your money don't fail to get our prices.

We also sell Engines, boilers, Pallet cars, Revolving derricks, Conveyors, Hoisting machinery, etc. Send for prices and terms.

## Thomas Carlin's Sons,

ALLEGHENY, PA.

Mey Detachable Chain Belt.

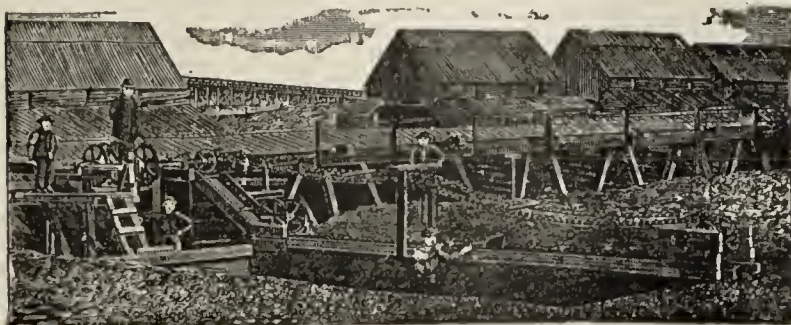
Ewart Detachable Chain.

**F. H. C. MEY,**  
**Chain Belting Engineering Works,**

Approved Appliances for  
**Elevating, Conveying and Transmission of Power,**  
64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

**Make  
Many More  
Thousands**

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

**FOR SALE**—One nearly new 4-mold Boyd Dry Press brick machine; one 4-mold Eureka dry press brick machine; one No. 2 Worrell clay dryer; one 48-inch Ross disintegrator; five second-hand horizontal boilers, 15 and 16 ft lengths, 3-inch tubes, ranging from 50 to 60 h. p., 5 and 6 foot diameter; one straight line engine, 14 x 14 cylinder, nearly new, a No. 1 order; 8 fans, 7 ft. diameter, good as new. Will be sold very low. Address C. SIEDLER, Pres. 156 Fifth Ave., New York.

### FOR SALE CHEAP.

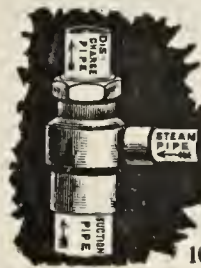
One second-hand, double die Columbian Repress; practically as good as new.  
One Quaker Horse-power Brick Machine, in good order.  
One Ten Horse Power Portable Engine, in good order. THE HORTON MFG. CO., Painesville, O.

### FOR SALE.

Two 8-foot dry grinding pans, under gear pan.  
One 8-foot, under geared, iron frame wet for wood work.  
One new 5-foot wet pan for wood frame.  
One Potts stock brick machine.  
One Potts sanding machine.  
One 7-foot horizontal pug mill.  
Two vertical pug mills.  
Large lot of steel and iron pallets.  
Twenty pallet cars.  
One 30 H.-P. horizontal tubular boiler.  
Lot of boilers, tanks, etc.  
THOMAS CARLIN'S SONS, Allegheny, Pa.

### FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.  
6 spring brick trucks.  
Lot shafting, belting and pulleys.  
1 Barr Pumping Company steam pump.  
All new or little used, and in excellent condition. WALNUT, Care Clay-Worker.



**VANDUZEN STEAM PUMP**  
THE BEST IN THE WORLD.  
Pumps Any Kind of Liquid.  
Always in Order, never Clogs nor freezes. Every Pump Guaranteed.  
**10 SIZES.**  
200 to 12000 Gallons per Hour.  
Cost \$7 to \$75 each. Address  
**THE E. W. VANDUZEN CO.,**  
102 to 108 E. Second St., Cincinnati, O.

## Study Law at Home.

An opportunity for ambitious young men to take up the study of law without neglecting the business of earning a living. You can live at home while preparing for admission to the bar. We require only your evenings and guarantee as thorough a legal training as may be had at any law school in America. Write at once for our special offer to new students.

**Indianapolis College of Law,**  
80 When Building, INDIANAPOLIS, IND.

## FORTIFY!

Fortify yourself against the delays and losses incident to constant repairs by using "The Machinery That Never Disappoints." You are then assured of a victory for profits in your yard. Write for particulars on all kinds of Clay-Working Machinery.

The American Clay-Working Machinery Co.  
BUCYRUS, OHIO, U. S. A.



## ENGLISH PLANS FOR PLASTIC BRICK WORKS.

Complete sets including general plan and elevation of works.

Plans and sections of machine room.

Plans for Dryer heated with waste gas from boiler.

Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.

Prices on application to

BENNETT & SAYER, Derby, England.

## A. F. TENNILLE'S

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## News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,  
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

The Henry Martin  
Brick Machine Mfg. Co.,  
Lancaster, Pa.

## Machine Brick Moulds a Specialty.

### PRICES:

Steel bound machine moulds,  
5 or 6 brick ..... \$1.75 each

With Steel Lined Heads,  
5 or 6 brick ..... \$2.00 each

With Panel Bottoms, solid, 5 cents per brick extra.

With name plates 5 cents per brick extra.

Top irons dovetailed, or crimped if preferred.  
Handles any desired pattern.

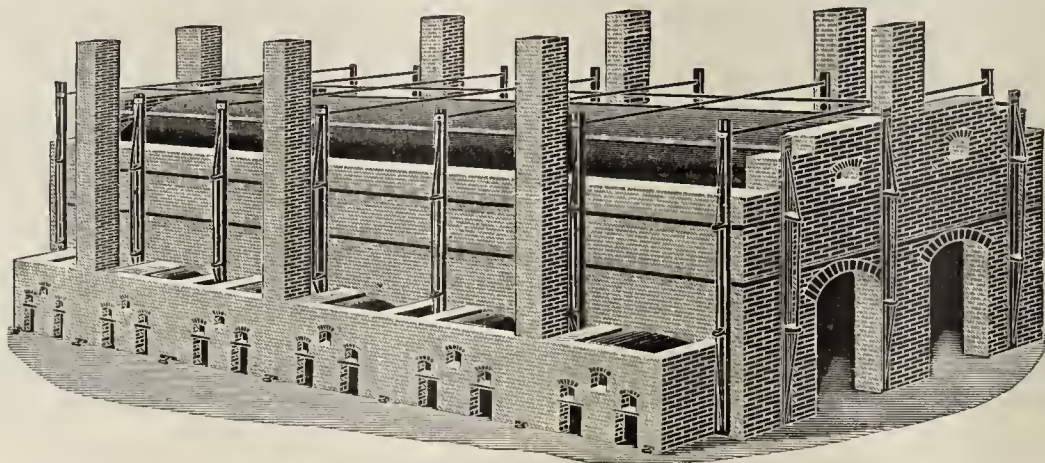
Prompt attention to all orders guaranteed.

**OUR GRAVERS  
ARE HANDLED  
BY SKILLED  
ENGRAVERS.**

LET US  
HAVE  
SOME OF  
YOUR BUSINESS

IND'PLS-ENGRAVING-ELECT-CO  
INDIANAPOLIS, IND.

## The SWIFT SLACK COAL COKING TABLE FURNACE KILN.



Furnaces can be attached to either Up-draft clamp kilns, or round or square down-draft kilns. Have already changed a large number of kilns of almost every patent, both down-draft and up-draft, and one continuous kiln for the Galesburg Paving Brick Co.

F. E. SWIFT, Washington, Ia., U. S. A.

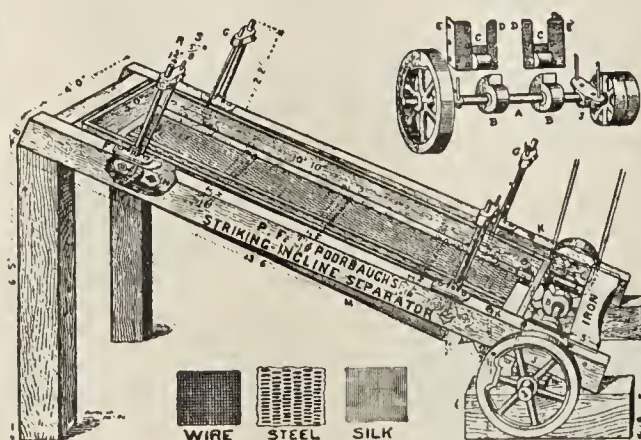
## The PERFECT CLAY SCREEN,

..Is the Acme of Perfection..

THIS SCREEN was not designed with the object of placing it on the market, but instead is the product of **Practical Experience**. The old adage "necessity is the mother of invention" is true in every sense of the word in this particular case. This screen is the result of the serious obstacles encountered in endeavoring to screen shale and fire clay for semi-dry pressed brick, and its work proves that it is worthy of its name—**Perfect**—for no dry pan can grind shale or fire clay or any other clay as moist as it can be screened on **The Perfect Clay Screen**. This screen enables its users to get more clay and a finer grade and with more moisture than any other make, in fact it is the only **Clay Screen** on the market. The commendable features of this screen are that it cannot be **pasted** over and **perfectly separates** all the clay to the full size of the perforations. Bear in mind that each and every one is fully guaranteed, no payment required until purchaser is satisfied. Taking into consideration that 10 of these screens have been sold since January 1st, is evidence that our claims can be substantiated by our patrons. Write for full description, prices and terms.

ELDER & DUNLAP, Bloomington, Ill.

## STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

• • • • •

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

## THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

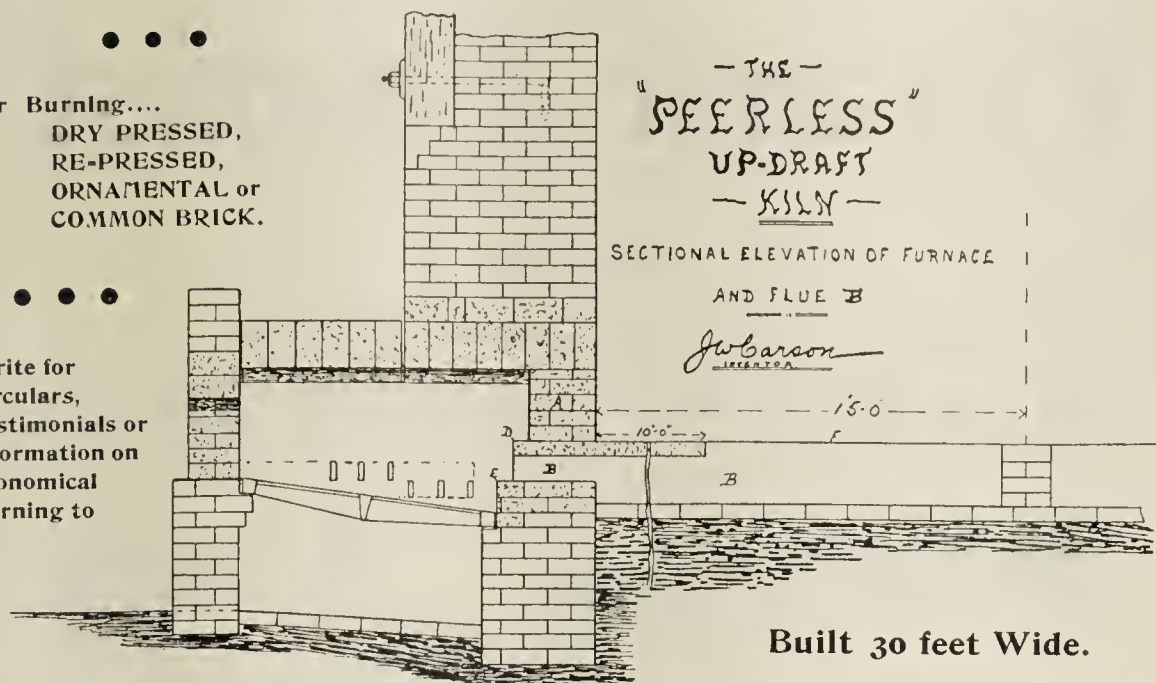
PITTSBURG, PA



# The "PEERLESS" UP-DRAFT ....KILN.

For Burning....  
DRY PRESSED,  
RE-PRESSED,  
ORNAMENTAL or  
COMMON BRICK.

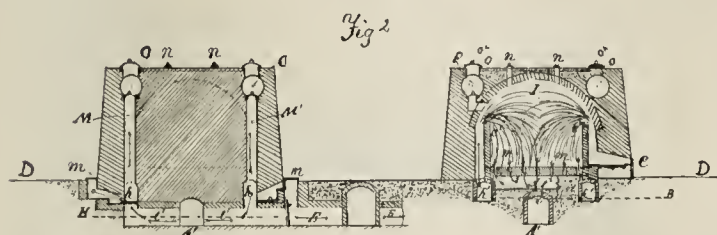
Write for  
Circulars,  
Testimonials or  
Information on  
Economical  
Burning to



Built 30 feet Wide.

J. W. CARSON, LaPrairie, P. Q., Can.

## The Down Draft Continuous Kiln.



This kiln is fired by suitable furnaces on each side of the tunnel, no fuel comes in contact with the clay ware, no firing through the top, no refraction from the down draft whatever; it saves as much fuel as the old Continuous fired through the top. It is adapted to use any suitable kind of fuel to

burn clay ware. The automatic draft regulator assures an even draft at all times in every compartment in operation. The cooling of the clayware is fully controllable in the hand of the burner at will. The draft of the advance heat and combustion through the floor is connected from compartment to compartment until the heat is taken up by the wares before leaving the stack. The heat from the cooling compartments are drawn to the compartments for steam drying the green wares. For small yards it is not necessary to construct the full kiln, only build compartments as is necessary for the output and if the demand requires more kiln room, extend any time later. I guarantee that my Kiln will burn as clear color, sound enameled clay ware as any other down-draft kiln in use. Parties intending to improve their product and profit should not fail to correspond with me in regard to cost of construction and license right, which I will give for a reasonable living price. In corresponding, state the kind of material manufactured, also daily capacity, to the Inventor and Patentee,

C. F. KAUL, Madison, Neb.

## NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in  
United States, Canada  
and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitriified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt.  
Marletta, Pa.

Chenoa, Ill.



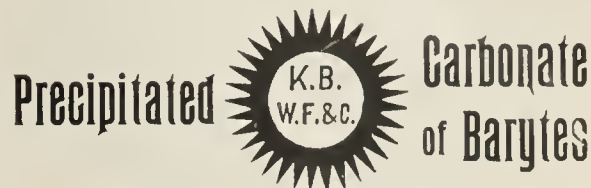
## GABRIEL & SCHALL

P. O. Box 2654.

205 Pearl Street.

NEW YORK.

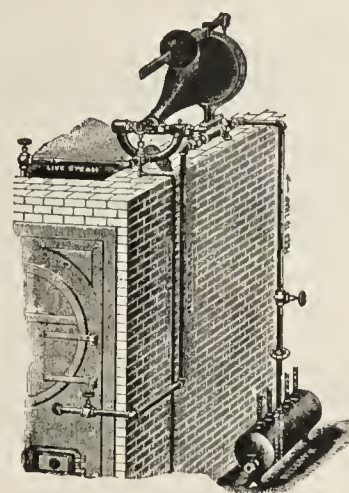
Sole Importers in the United States of the



The only preventative for seum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

## Return Trap



For returning direct to Boiler the condensed Steam from the steam dryers, etc.

Positive and Automatic.  
Economical.

If you are using steam apparatus, particularly a steam dryer, I can save you good money.

For particulars write to

A. SORGE, Jr.,

1021 Monadnock Block, CHICAGO, ILL.

## Protection!



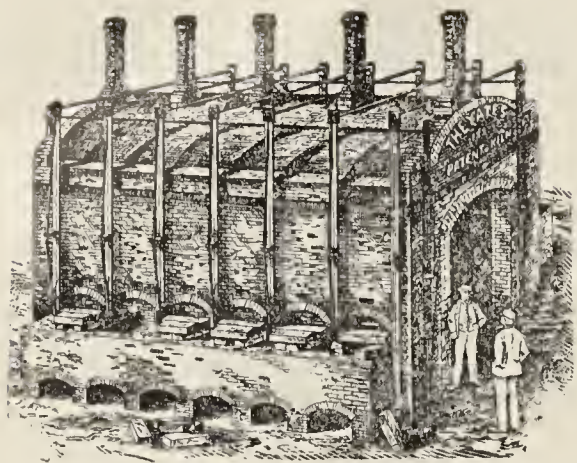
Uncle Sam can't protect you from loss, but the American Co. can. We can protect you by furnishing a faultless equipment, machinery built of honest, flawless iron in an honest faultless manner by workmen who are skilled in their lines. We manufacture Dry Press, Stiff Mud and Soft Mud Machinery of all kinds.

THE AMERICAN  
CLAY-WORKING  
MACHINERY CO.,

BUCYRUS, OHIO,

U. S. A.





For Economy of Fuel and Percentage of Hard Burned Brick.

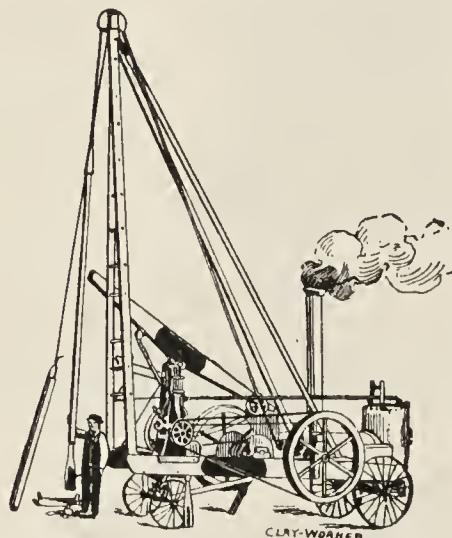
This kiln has no equal, come and see what we are doing.

**ALFRED YATES,**  
Man. Johnsonburg Vitriified Brick Co.,  
Johnsonburg, Penn.

**W. R. Osborne,**

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

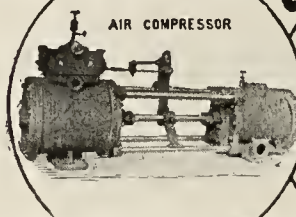
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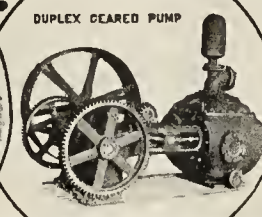
# S. GEYSBEEK, Ceramic Chemist,

New Brighton, Pa.

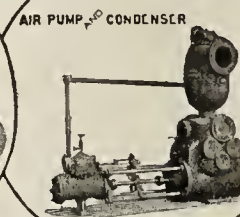
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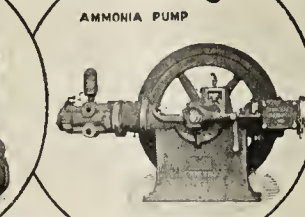
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PUMPING MACHINERY  
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For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

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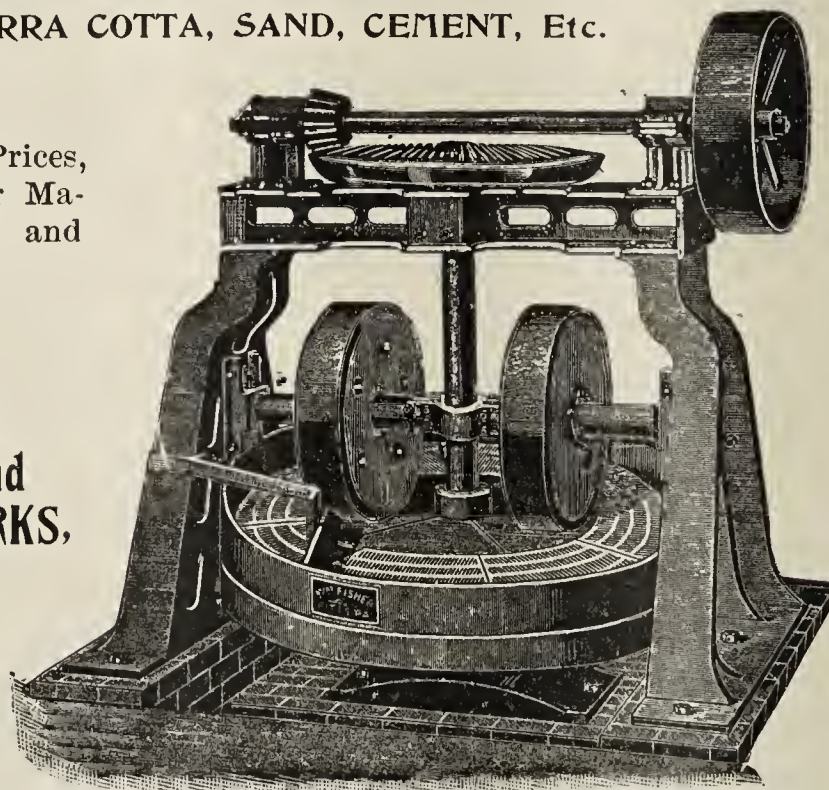
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state kind of Clay or Material to be ground and capacity required.

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# The Carmichael Clay Steamer,

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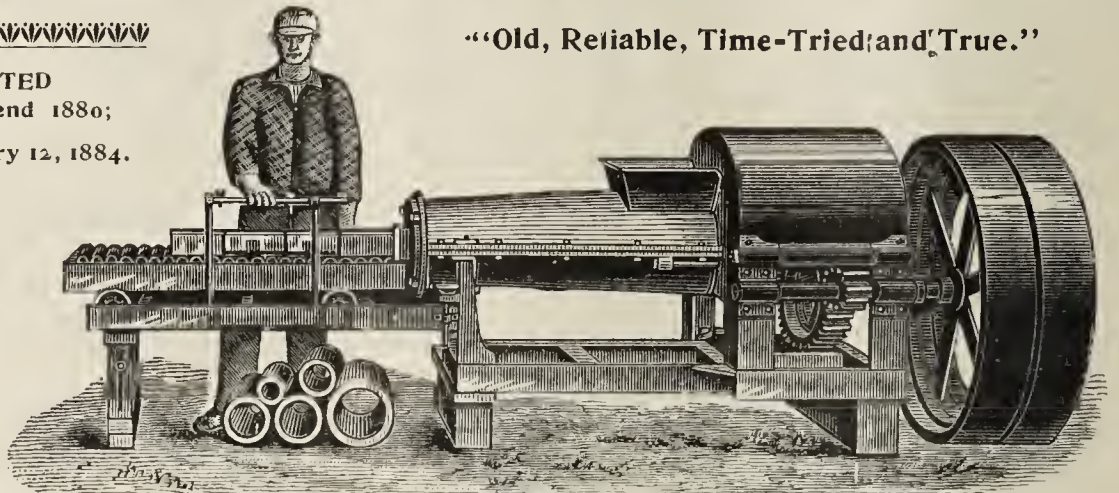
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## IMPROVED BRICK AND TILE MACHINES

PATENTED

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P. H. Kells, the Original Inventor of the Auger Machine.

**THIS MACHINE** works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

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Bucyrus, Ohio, U. S. A.



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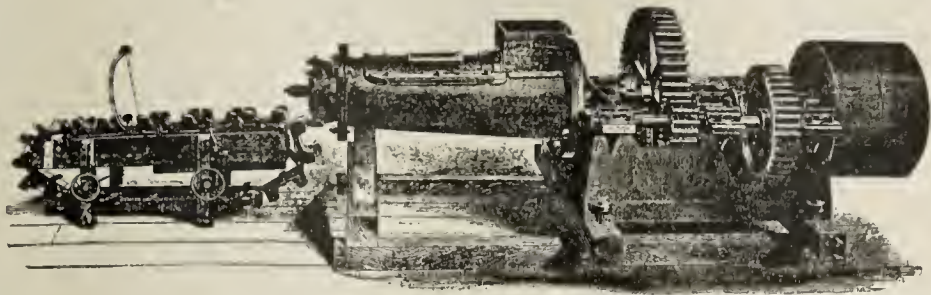


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Manufacturers  
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## Tile and Brick Machines.



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Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

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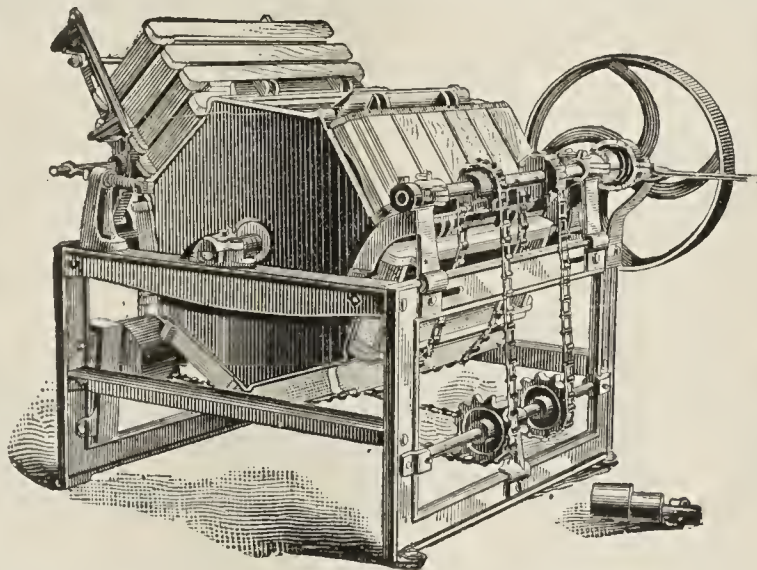
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No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

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Manager and Sole Agent,  
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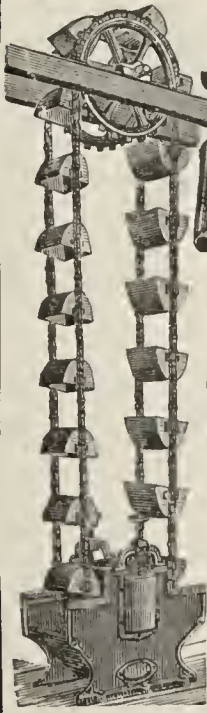
The case of Newton vs. Buck, has again been decided, February 4, 1898, by Judge Cox, in the United States Court, holding that Newton is the owner of patents, Nos. 284,115; 301,087; 272,698; and 407,030, and has the exclusive right to manufacture machines under these patents, and entitled to an injunction against Buck and all persons claiming through or under him, from making, using or selling the Buck machines, and for damages for past infringements. This is absolutely the end of the long litigation between Newton and Buck and every point is decided in favor of Newton.

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6,000 two-inch Pots;

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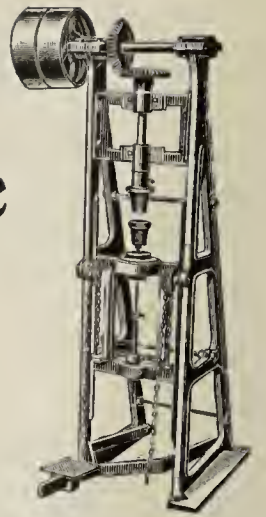
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Write for Circular and prices.

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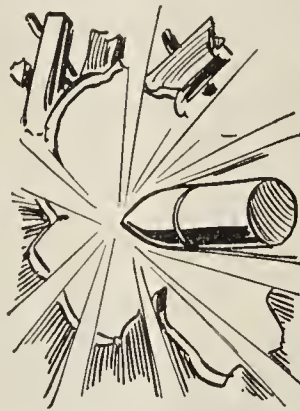
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Who hasn't heard of the American eagle, now on its way with peace for Cuba. Who in the Clay-Working Trade has not heard of the American Eagle Repress? It brings you peace and also prosperity. No repairs, no toggles. The monarch of every repress, the victor of every contest. It's the only press that's best. Write to-day, tomorrow never comes.

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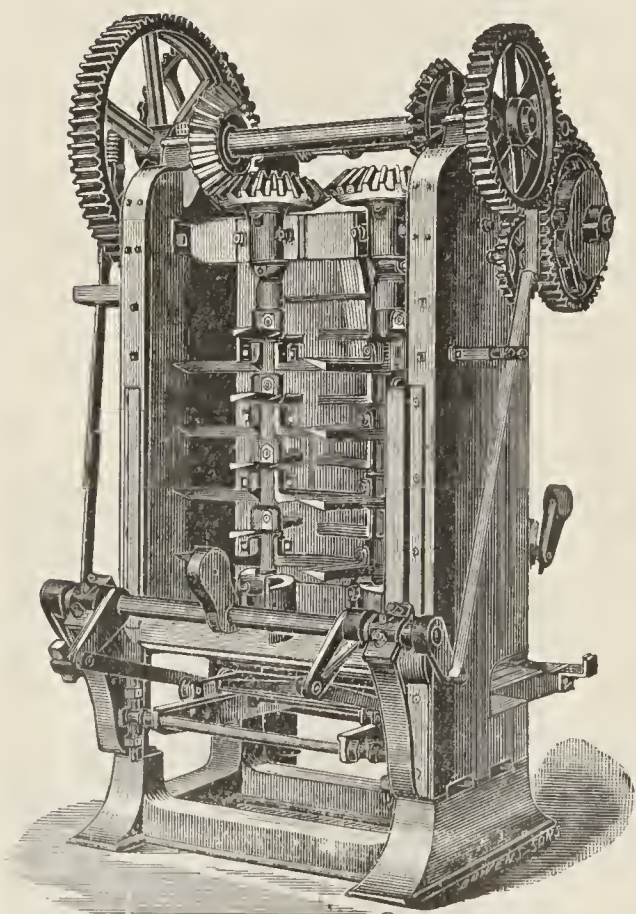
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We hit the mark every time. Our aim is to sell you machinery that will make you money, so built that repairs are few. If you are pleased you'll call again. We have customers who have called a dozen times. They succeed and branch out, this means more machines. They like ours and come to us. Every machine and appliance used in the manufacture of clay products.

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It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

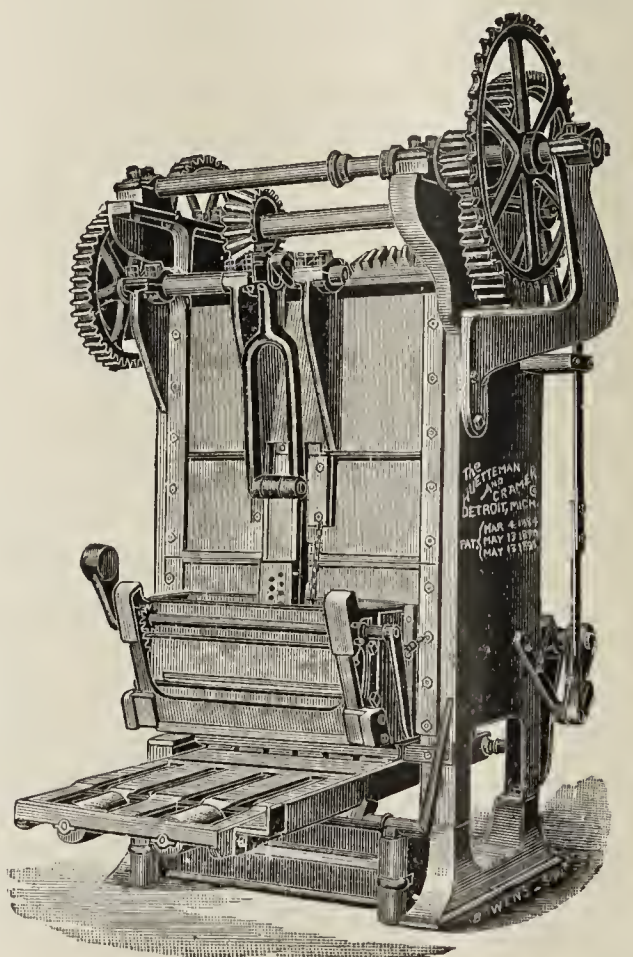
WRITE FOR CATALOGUE  
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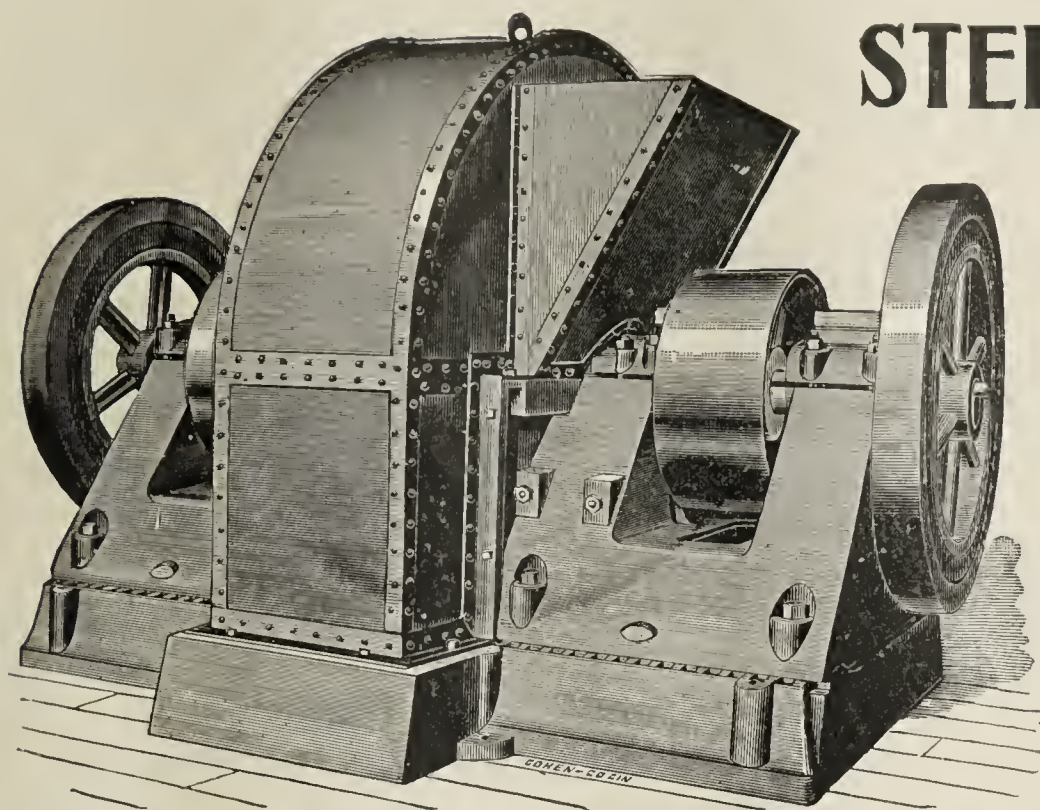
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For Thoroughly  
Pulverizing Clay in a  
Dry, Semi-Dry or  
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

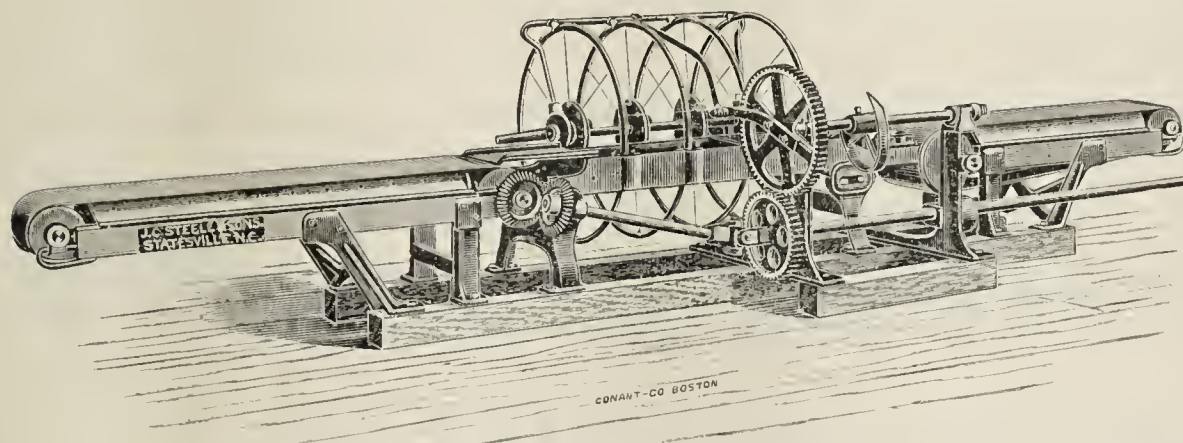
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## The "New South" Brick Machinery

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.



Automatic Cutting Machine.

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Yours truly,  
J. W. CARY, JR., & Co.

Strictly modern machinery at the lowest price. Send for Catalogue.

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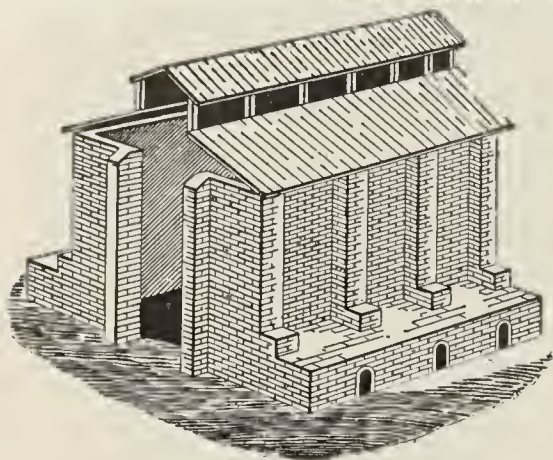
We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

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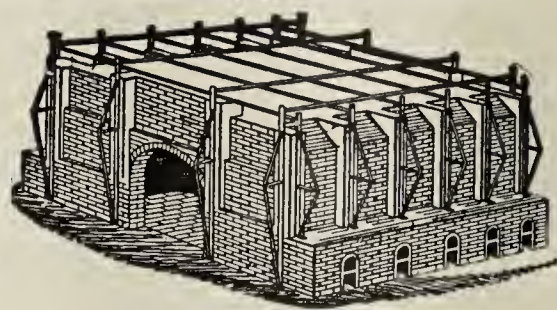
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For Burning all Kinds of Wares.



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The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

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It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

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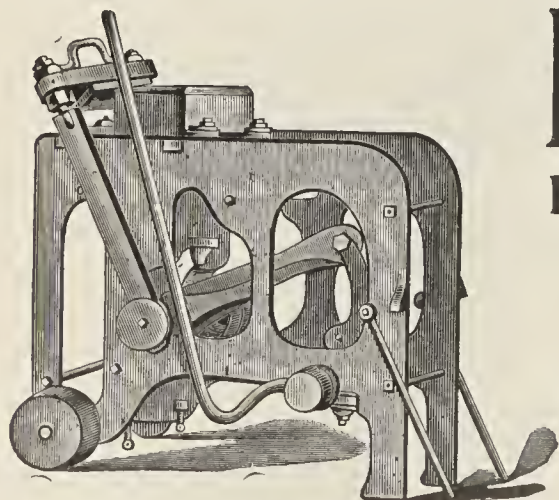
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

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**GEORGE CARNELL,**

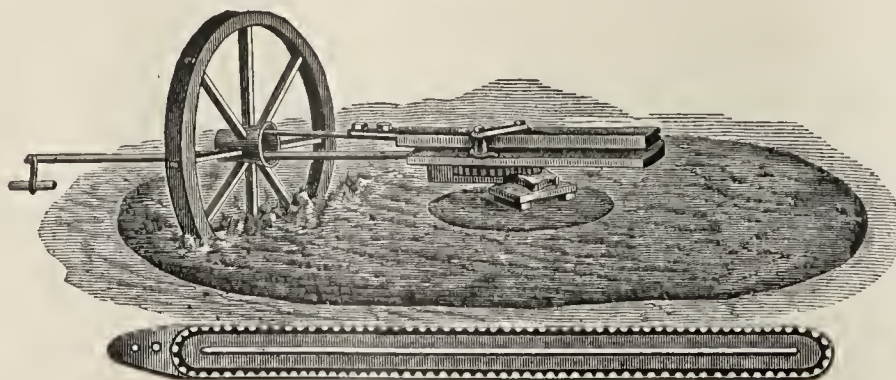
Nos. 1,819, 1,821 and 1,823 Germantown  
Avenue and Fifth Street,  
PHILADELPHIA, - - - PENN.

## PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.

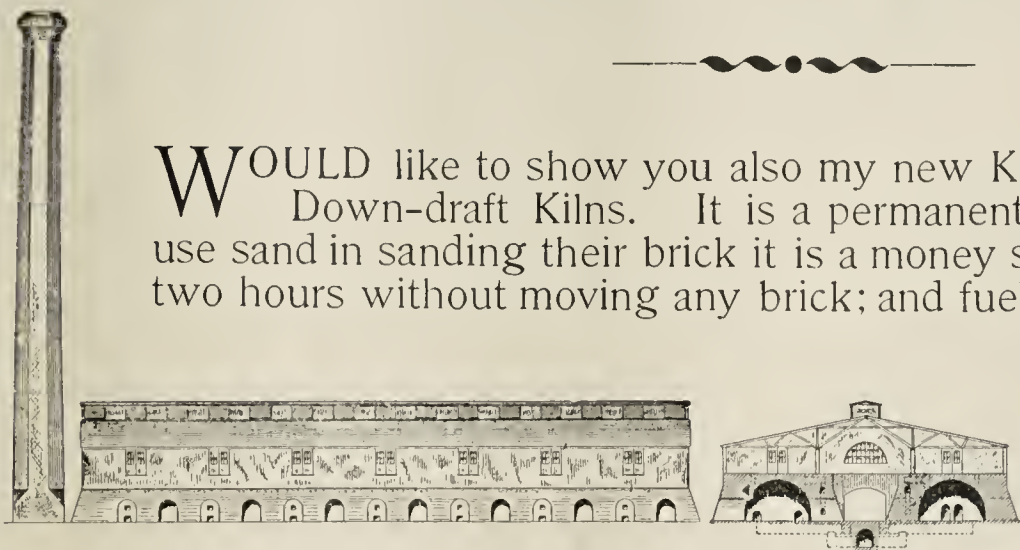


# HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



WOULD like to show you also my new Kiln Floor for Round or Square Down-draft Kilns. It is a permanent floor, to any one who has to use sand in sanding their brick it is a money saver, a floor can be cleaned in two hours without moving any brick; and fuel is saved in the burning of the product, and a great deal of annoyance saved in leveling etc., for dry pressed and other high grades of brick.

Address H. HAIGH, Catskill, N. Y.

## The Lehmann <sup>Portable</sup> <sub>Continuous</sub> Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

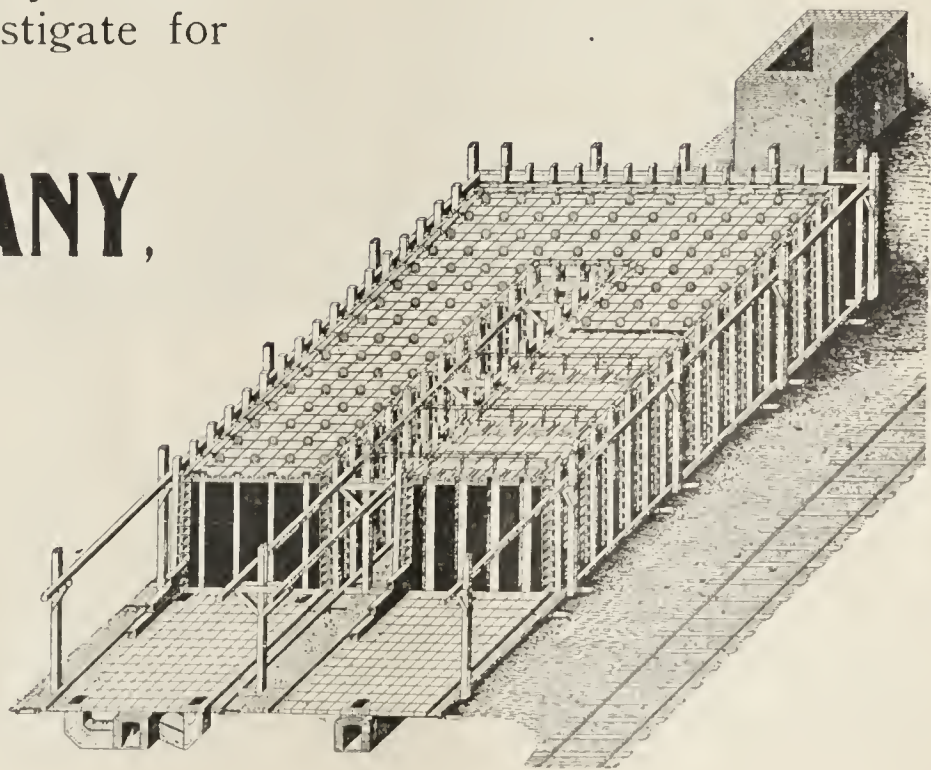
### F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,  
Plans and estimates furnished for Brick, Lime and  
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.





# Morrison's Latest

## Improved Kiln,

### FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

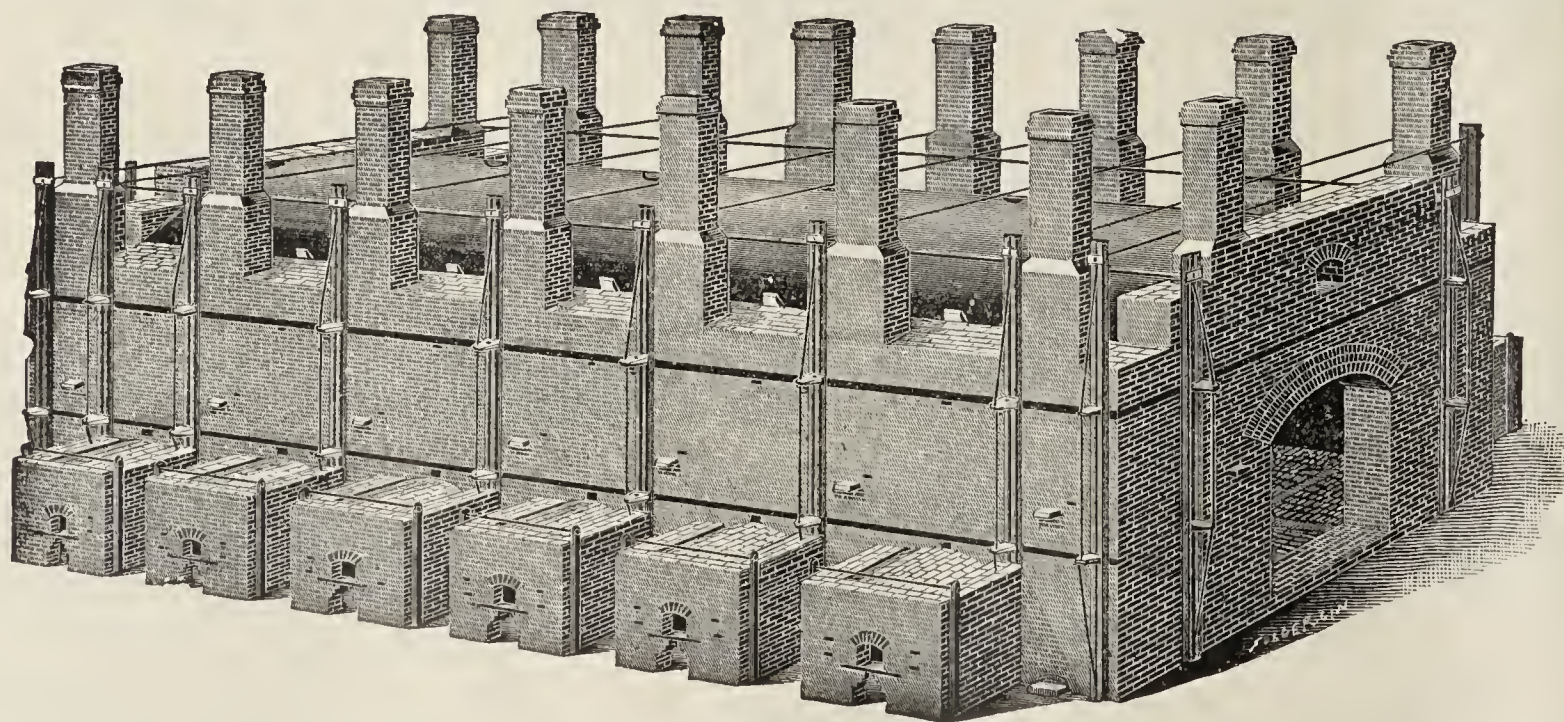
**R. B. MORRISON & CO.,**

*P. O. Box 335.*

*ROME, GA., U. S. A.*

## The EUDALY

IMPROVED —  
DOWN-DRAFT KILN  
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

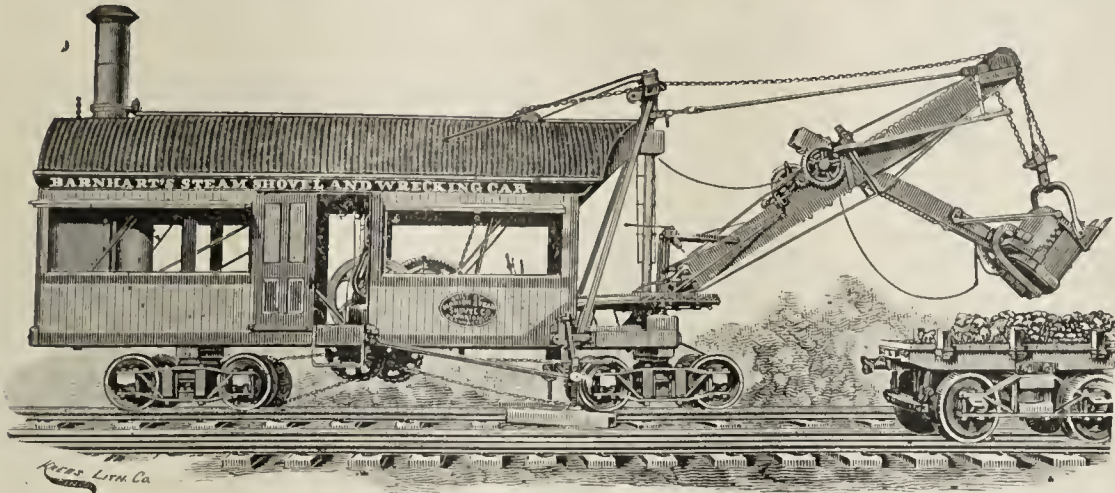
We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

**W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.**



# Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

**The Marion Steam Shovel Co.,**

603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

## We Are Ready!



To meet any competitor. We invite inspection. We challenge comparison. We guarantee satisfaction. When we sell a machine we deliver a value equivalent to your cash. You buy a quality you will always be satisfied with. Few repairs and profitable work are attributes of our Dry Press, Stiff Mud and Soft Mud Machinery.

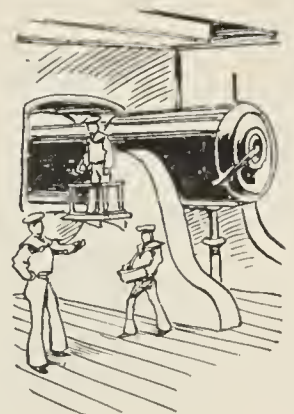
Write for particulars.



THE...  
AMERICAN  
CLAY-WORKING  
MACHINERY  
CO...

Bucyrus,  
Ohio.  
U. S. A.

## Man the Guns!

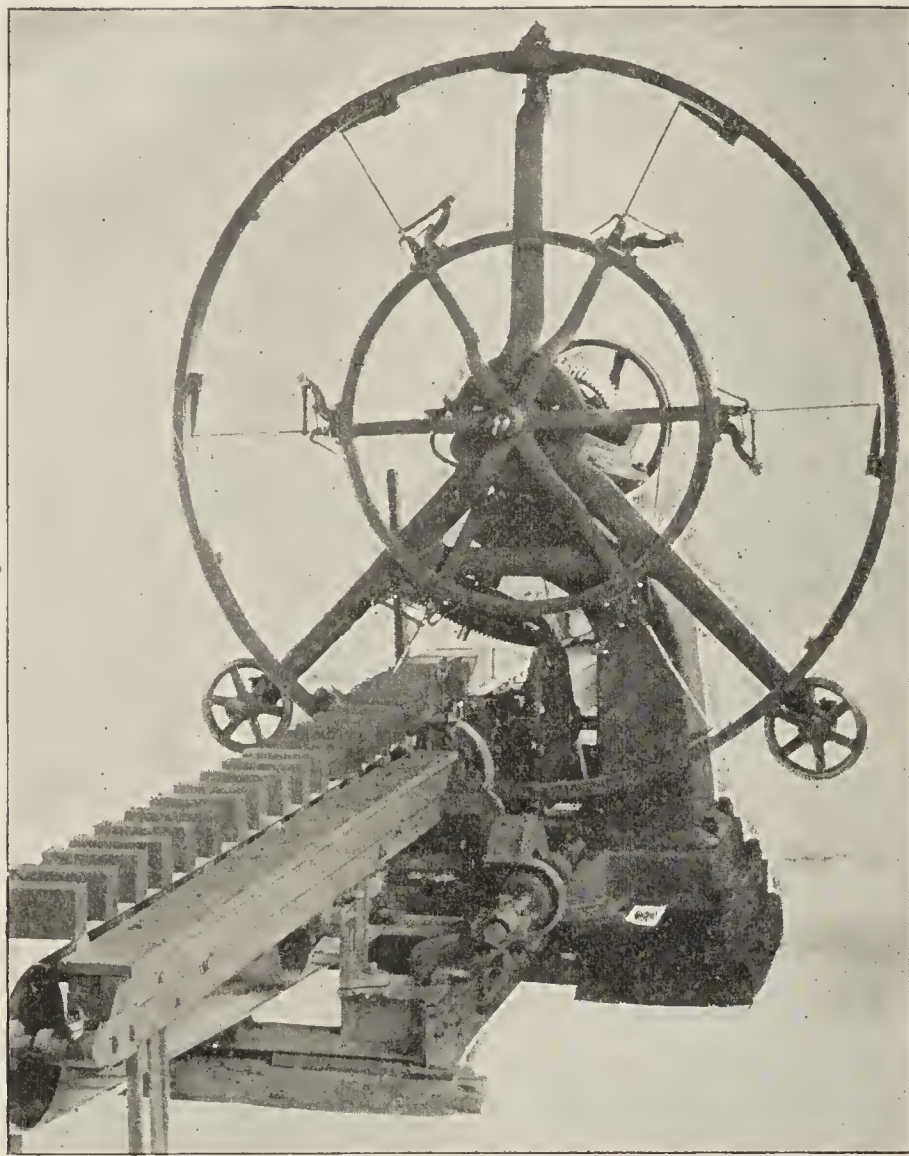


We are manning our guns not so much for gain as glory. We have made a reputation for rightful building of Clay-Working machinery which brings good reports from every user. Our line includes every machine necessary for the manufacture of clay products. What are your wants? Write to-day.

**The American Clay-Working Machinery Co.,**

Bucyrus, Ohio, U. S. A.





The Chambers Automatic Side-Cutter.

## Automatic Side-Cutter For Stiff-Tempered Brick Machines.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

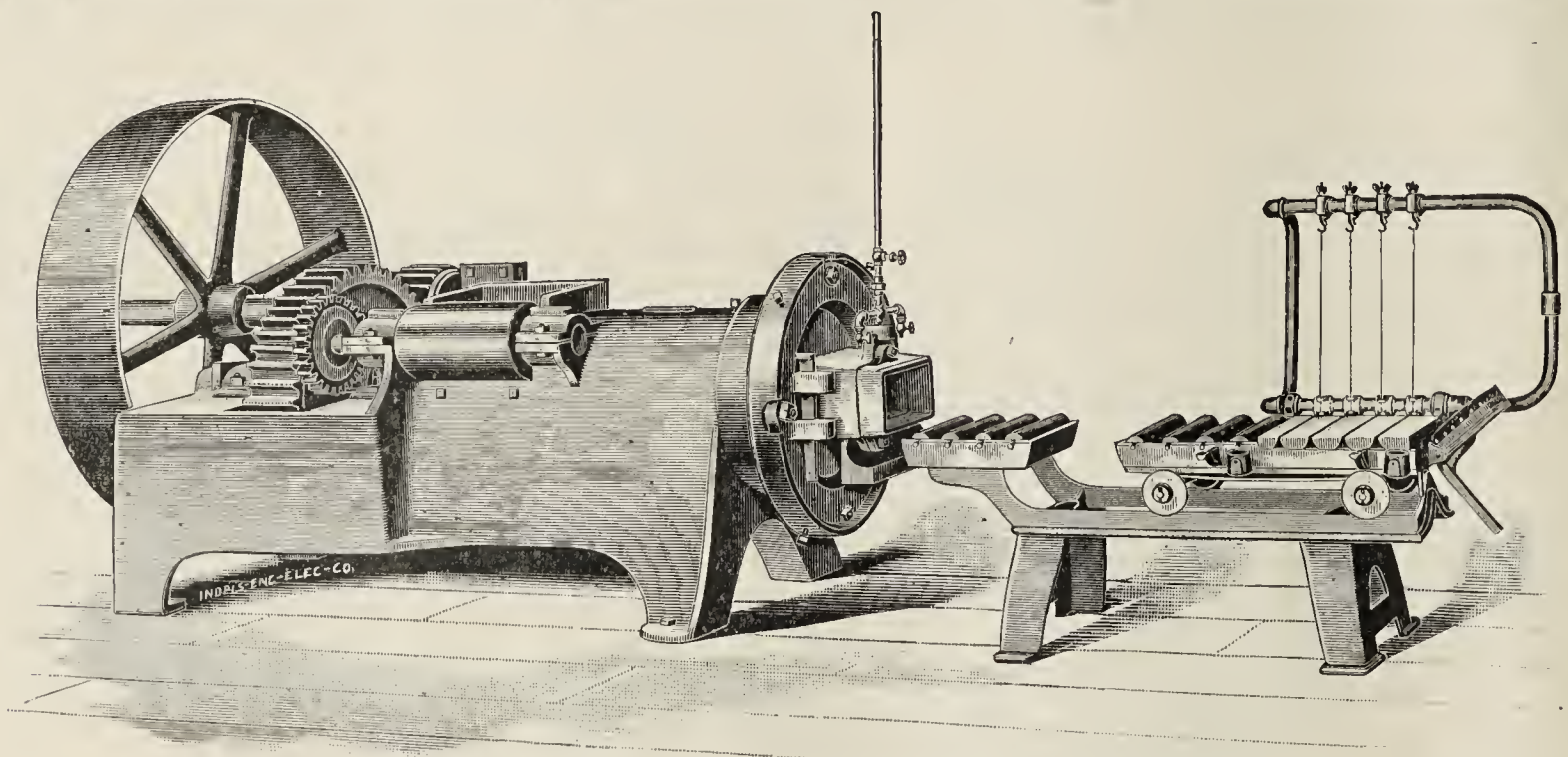
An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

The machinery is above the dirt and all gearing encased.

MANUFACTURED and  
GUARANTEED. . . .

**Chambers Brothers Co.,**  
**PHILADELPHIA, PA.**

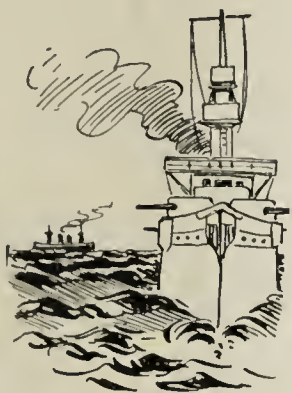


**This Cut Illustrates** our smallest brick machine, **Leader No. 15**, which has a general average capacity of 20,000 side cut or 15,000 end cut brick per day. Like all **Leader** machines it is simple, strong and efficient. Printed matter describing this and larger machines as well as Represses, Automatic Cutters, Pug Mills, Crushers, etc., etc., will be mailed free to any address.

Complete brick machinery outfits of any desired capacity our specialty.

**LEADER MANUFACTURING CO., Decatur, Ill.**





## Our Guns Are Pointed

And our aim is to give you machinery which is worth dollar for dollar what we charge for it. If excellence of material, the know how of construction, the best patents and the sanction of the most progressive clay workers of the country count for anything then you can run no risk in buying "The Machinery that Never Disappoints." It costs little to get particulars, a minute and a postal will bring a reply. Dry Press, Stiff Mud and Soft Mud Machinery.



The American Clay-  
Working Machinery Co.,

Bucyrus, Ohio, U. S. A.

## A Boom

in the Brick business may not come today, but it's only a question of time. Are you prepared for the boom when it comes? Why not make the needed improvements now.

Look about your plant and see what you need, then write us for prices, terms and information. We make "The Machinery that Never Disappoints."



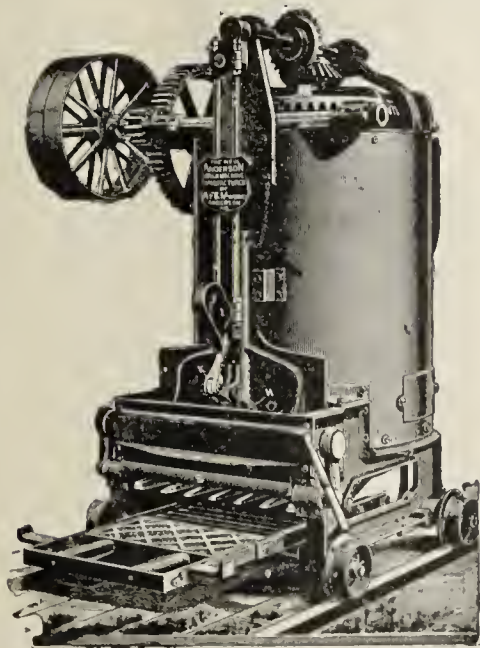
THE AMERICAN  
CLAY - WORKING  
MACHINERY  
CO...

Bucyrus, Ohio.

U. S. A.

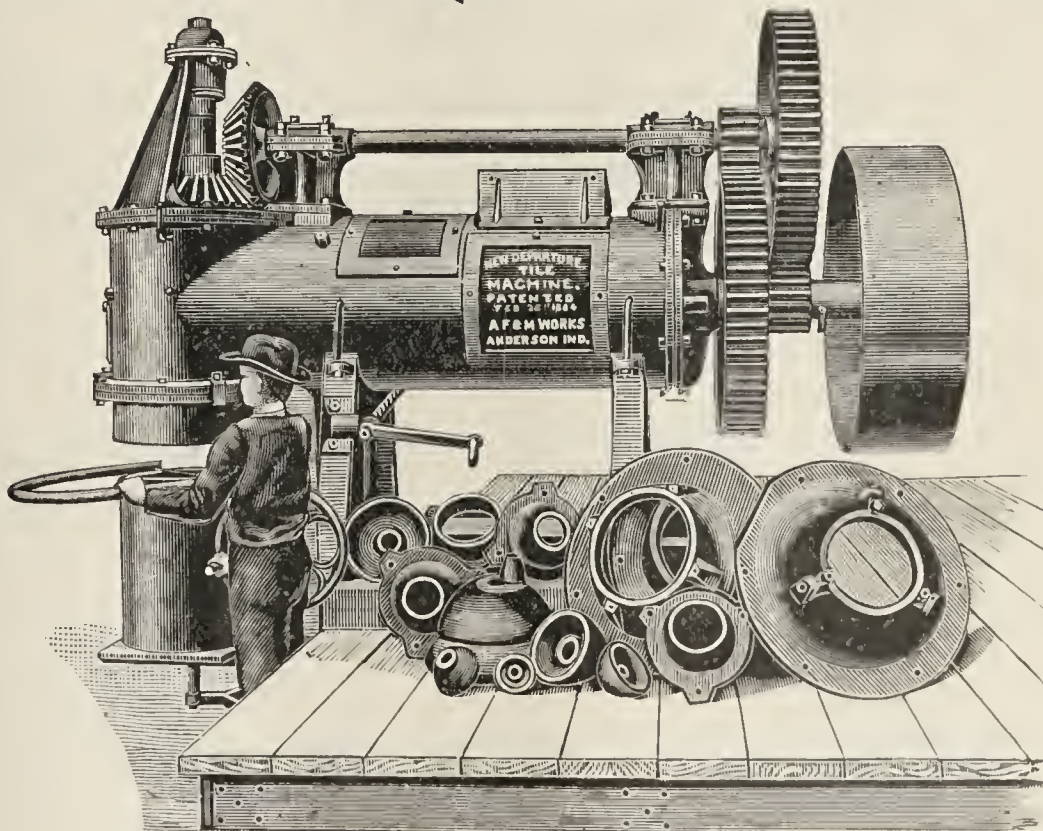
# New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.  
Steam Power.

Write  
for  
Catalogue  
and  
Prices.



NEW DEPARTURE TILE MILL.



The New Departure Tile Mill.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

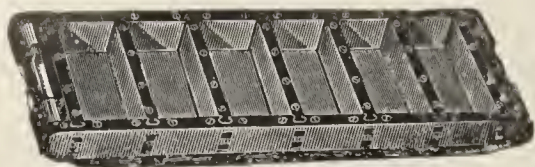


THE ANDERSON FOUNDRY & MACHINE WORKS,

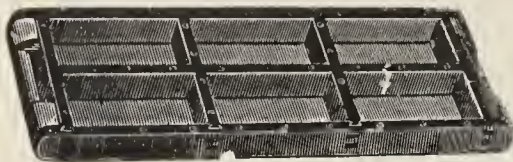
Anderson, Indiana



# DO YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

future delivery desired now. We make the best

You are missing good thing if you art not. You must no expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see!"

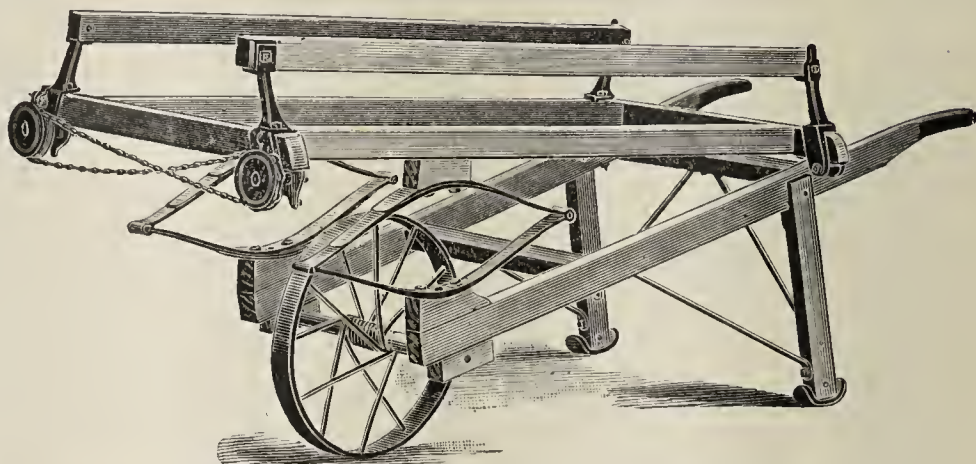
We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

➔ Moulds, Trucks  
and Barrows,

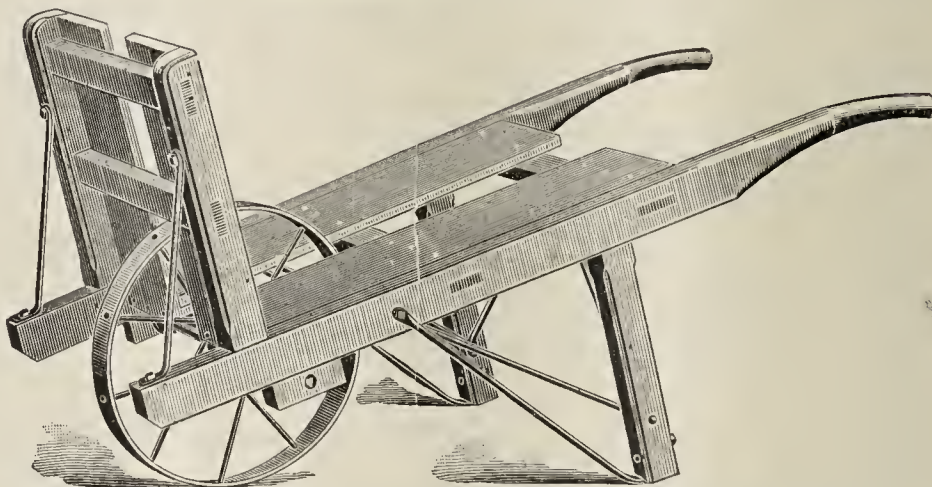
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00  
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

## The Past and the Future



## In the Past

# Cutting

## BICYCLES.

Have given universal satisfaction.

In the Future we agree to protect you by our liberal guarantee.

Six models to select from \$35, \$45, \$60.

We refer by permission to the editor of the CLAY-WORKER.

Get our Catalogue.

These wheels are fitted with gear cases and the Willits Rear Hub Brake.

A full line of Cycle Sundries.

Get our Sundry Catalogue.

# HAY & WILLITS MFG. CO.

West 18th St. and Belt Railroad, INDIANAPOLIS, IND.



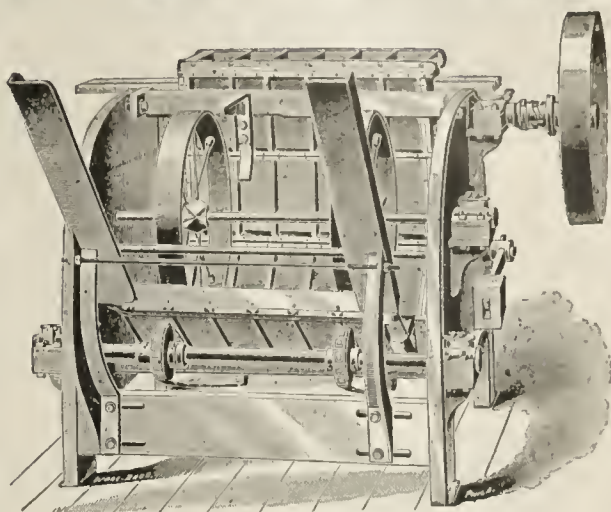
# See What One of Our Customers

Says of the "Hercules."

This machine is simple in construction, powerful in operation, and practicably non-breakable, cannot fail to lead the procession.

Will be glad to correspond with any one in regard to brick machinery.

SEND FOR  
'98 CATALOGUE.

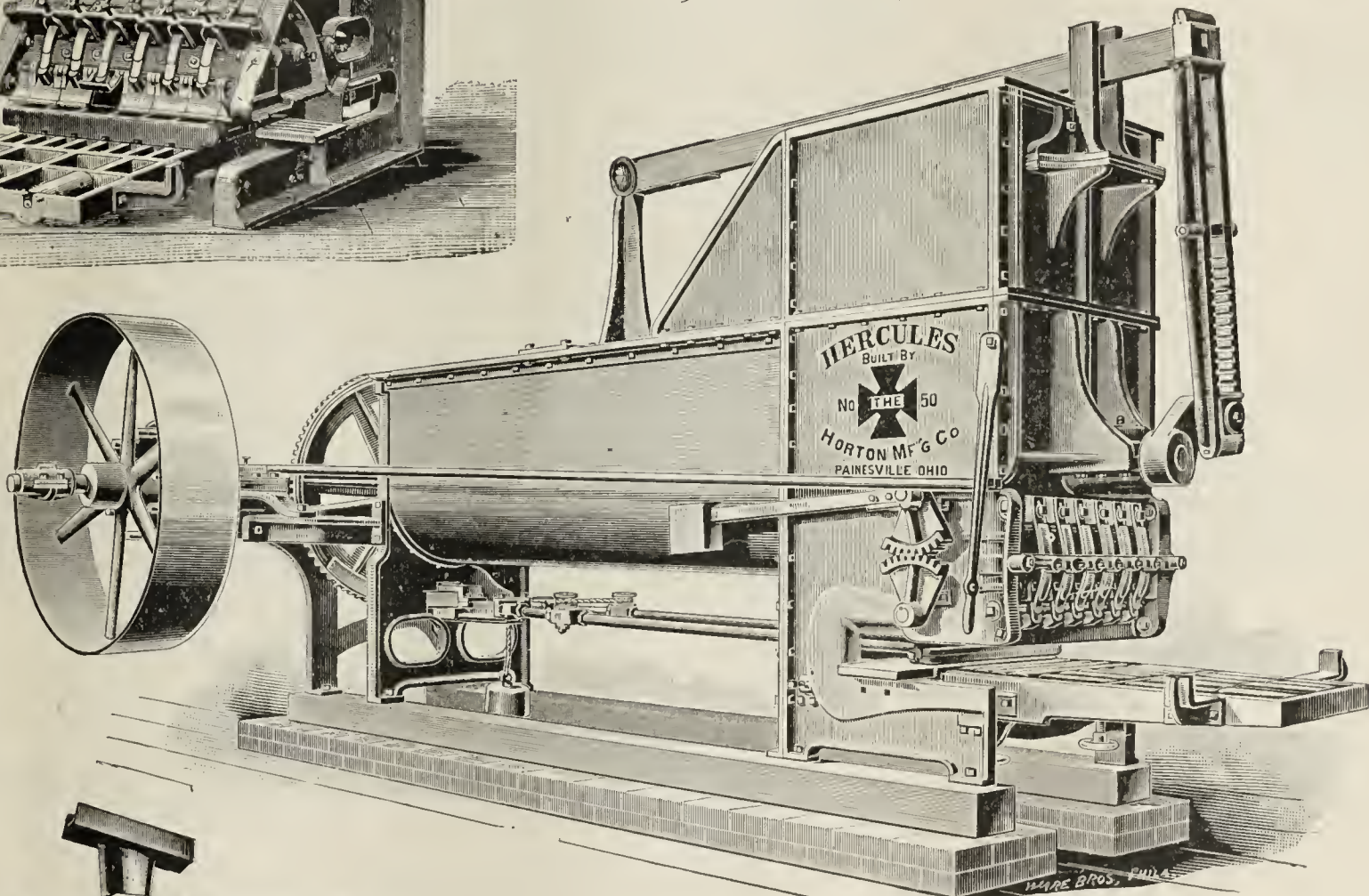


HORTON MOLD SANDER DIRECT FEED.

Standard  
"Special"  
Heavy  
Steam  
Power.



Hercules capacity 40,000  
to 50,000.  
Weight 7½ tons.



We are making a special drive on Molds this season. Send for our new circular on molds.

FRANK DUDENHOEFFER,

Manufacturer  
... of **BRICK,**

130 West 24th Street.

HORTON MFG. CO., Painesville, Ohio.

Gentlemen:—I have had your Hercules brick machine in operation for sometime, and wish to say that it makes the best square brick in the market, and it runs easiest of any brick machine that we ever saw. I save \$2 in coal every day I make brick and it will make from 30,000 to 50,000 brick in ten hours without any inconvenience, the only trouble I have is getting clay enough to the machine.

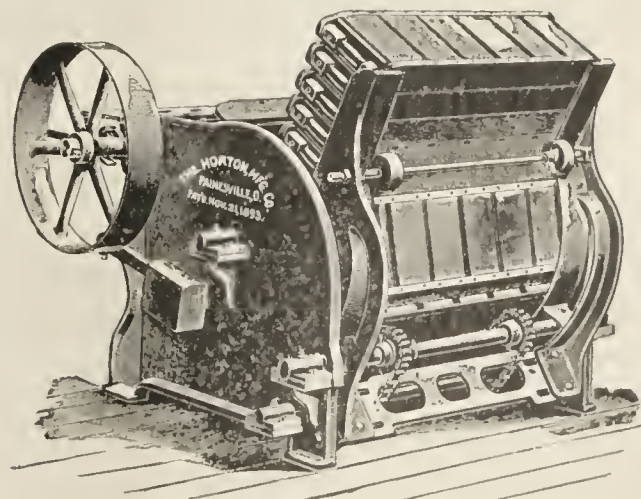
It does more than I expected and I think that you have the finest machine on the market and you will have no trouble in selling them. If any body wants to see how the machine works, send them up to my brick yard and they can convince themselves of what I say.

Very respectfully yours,  
FRANK DUDENHOEFFER.

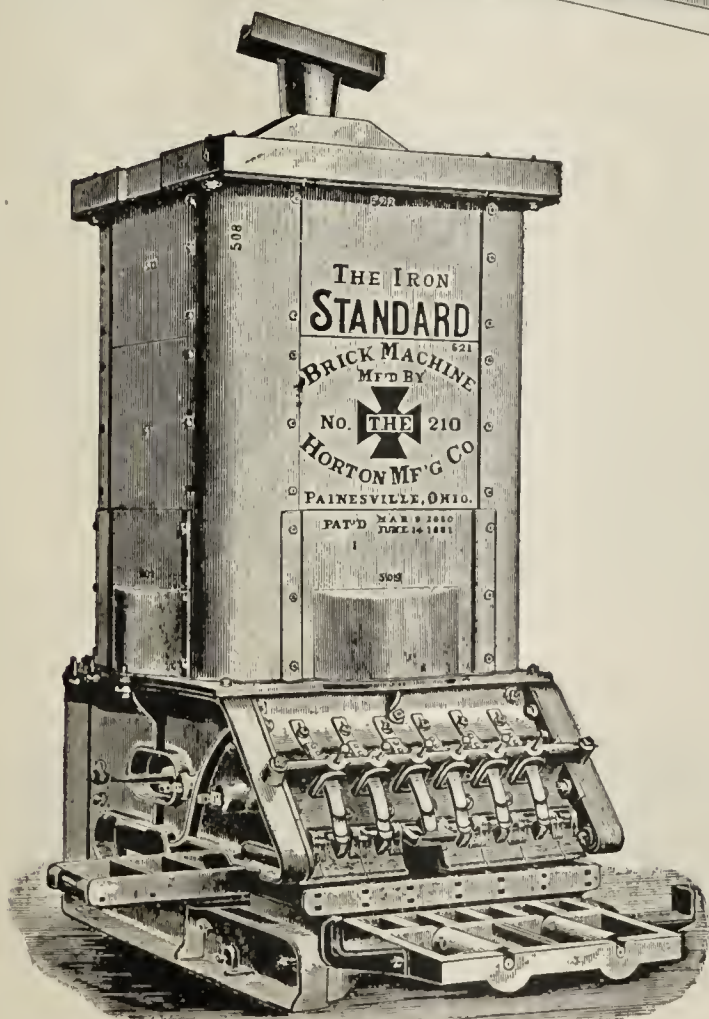
...

The Horton  
Manufacturing  
Company,

PAINESVILLE,  
OHIO.



THE AUTOMATIC FEED MOLD SANDER.



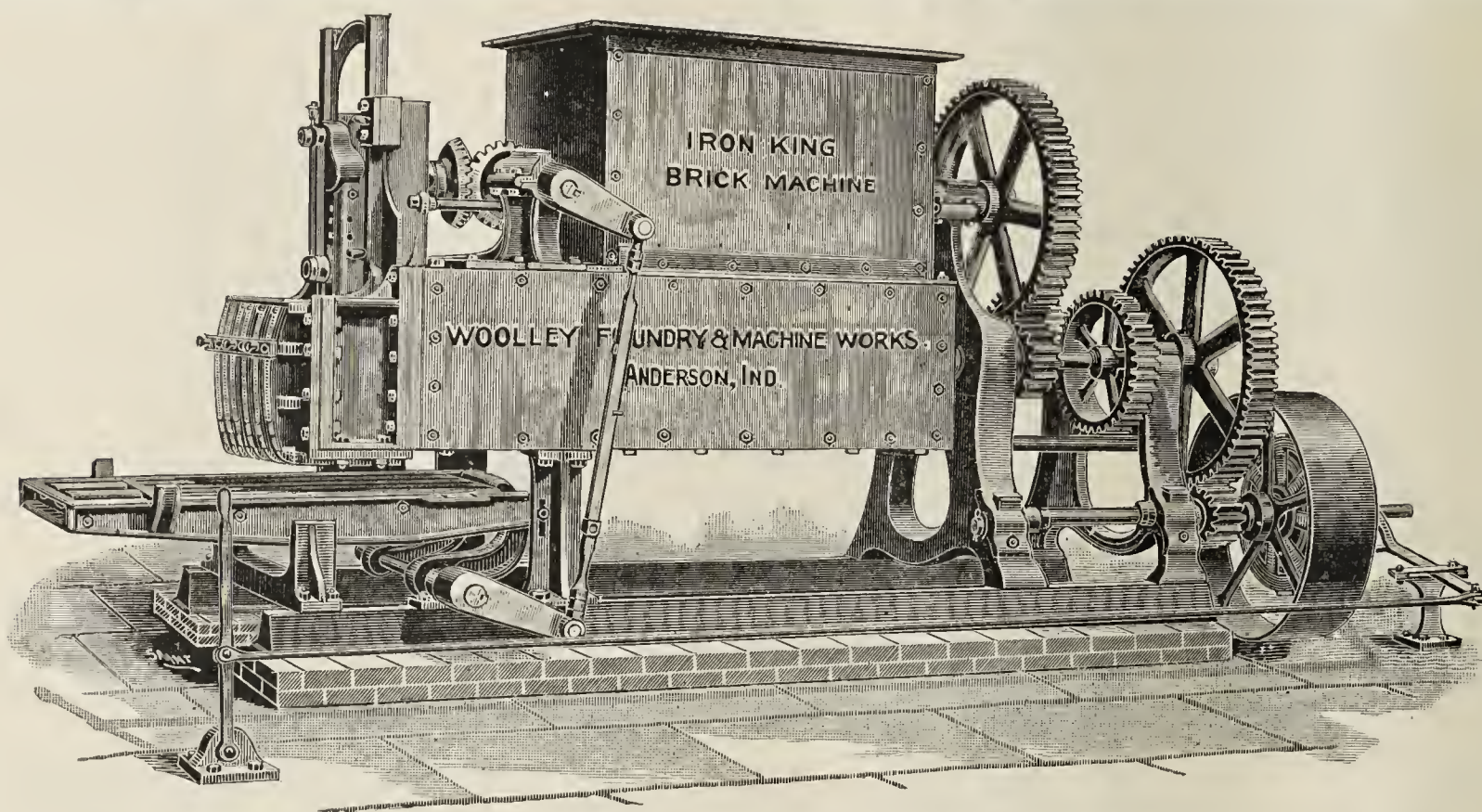
IRON STANDARD HORSE POWER.



# SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “**IRON KING**” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

**WOOLLEY** DRY PANS,  
PUG MILLS,  
SLIP PUMPS  
and PRESSES

Are all made for hard service If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US  
PLEASURE TO QUOTE  
YOU PRICES. . . .

Mention the Clay-Worker.

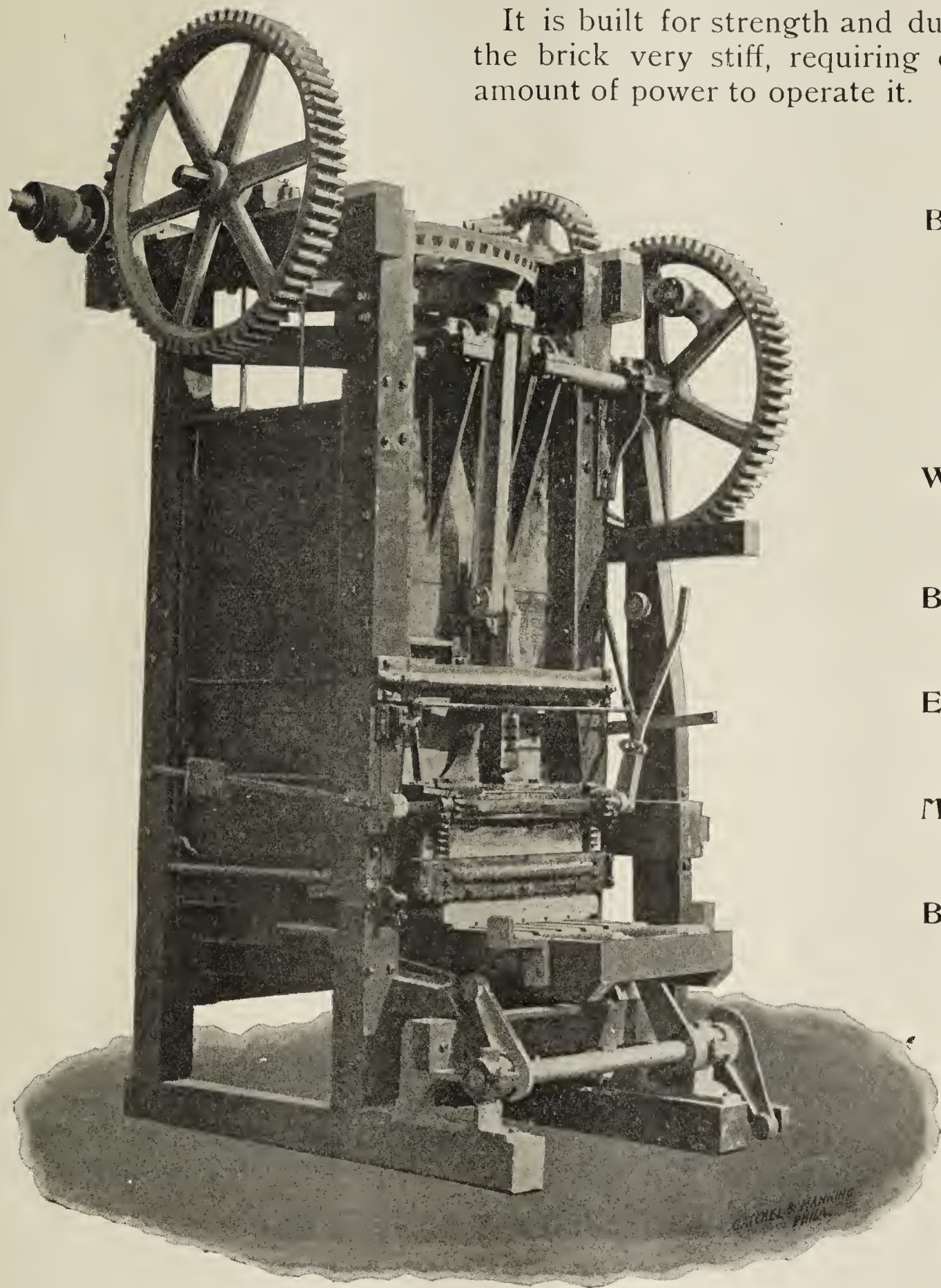




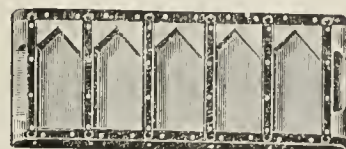
# The Favorite Stock Brick Machine.

Weight 10,500 Pounds.

It is built for strength and durability, and to mould the brick very stiff, requiring comparatively a small amount of power to operate it.



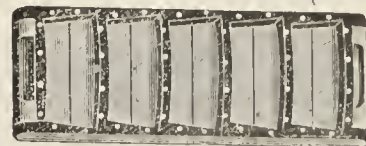
• • •  
BRICK MOULDS



....a Specialty.

• • •  
We furnish everything  
a Brickmaker needs.

• • •  
Brick Machines,  
Pug Mills,  
Clay Crushers,  
Elevators,  
Sand Grinders,  
Mould Sanders, etc.  
Machine Moulds,  
Hands Moulds,  
Wheel Barrows,  
Brick Trucks,  
Sand Dryers,  
Dump Cars,  
Dryer Cars,  
Kiln Castings, etc.



ALL SIZES. ALL SHAPES.

Send for our 1898 Catalogue and mention anything you need.

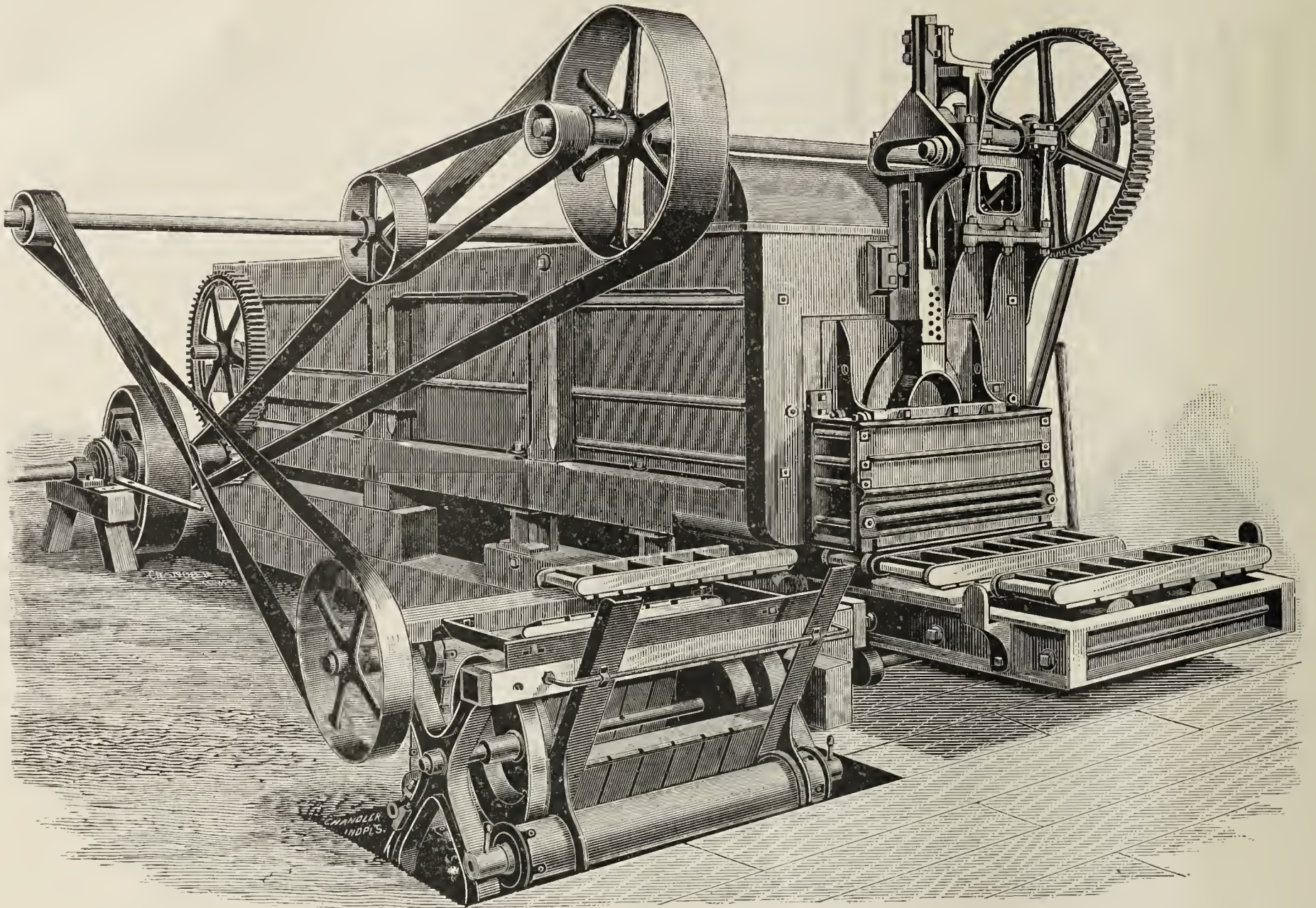
## The Henry Martin Brick Machine Mfg. Co.,

OFFICE AND WORKS: 552 No. Charlotte St.

LANCASTER, PENN.

Postal Telegraph-Cable Co. Direct wires to Factory Office.





And from every State in the Union we have any number of just such letters as the above.]

...THE...  
**POTTS** Horizontal Stock  
 Brick Machine

*Is the LEADER.*

Hundreds of them are in use and every one giving entire satisfaction. We manufacture everything needed on the Brickyard. Now is the time to purchase your supplies for the coming season.

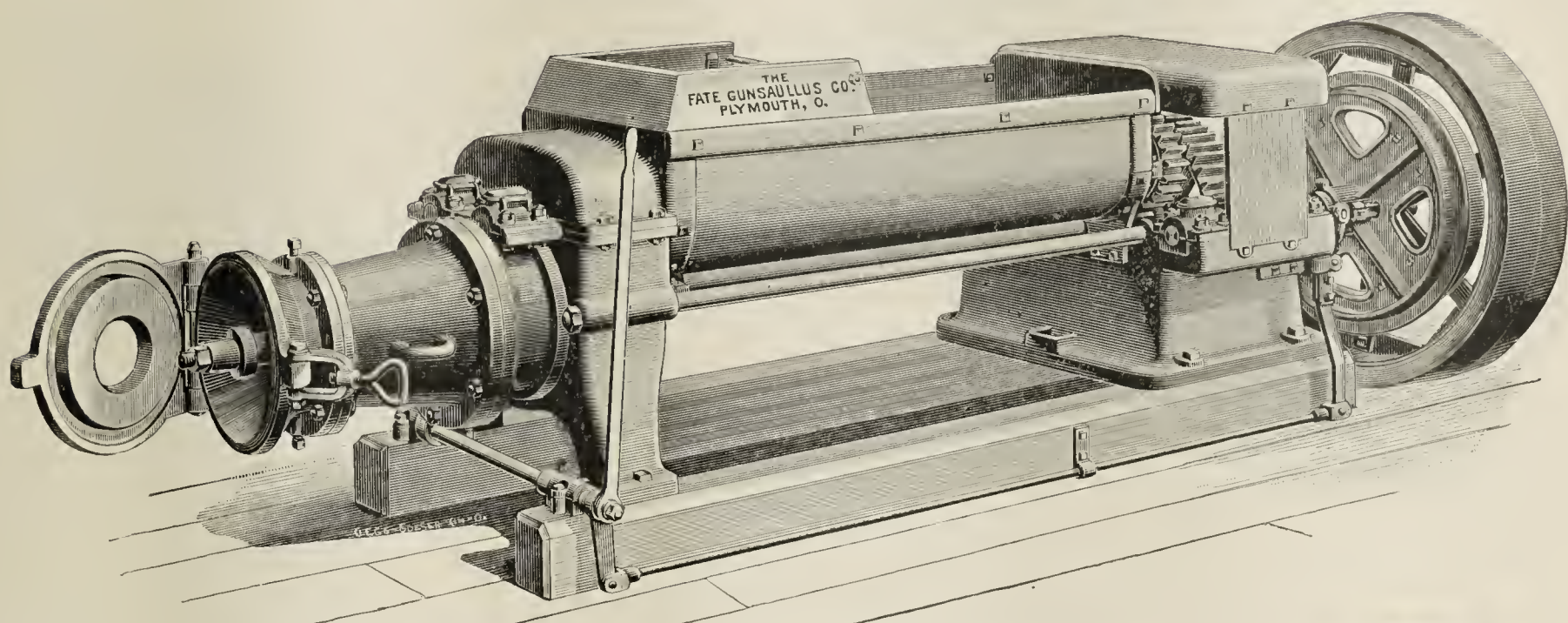
Brick Machines, Disintegrators, Mould Sanders, Granulators, Elevators, Cars, Winding Drums, Moulds, Trucks, Barrows and all Brickyard supplies.

Our prices are low and terms liberal.

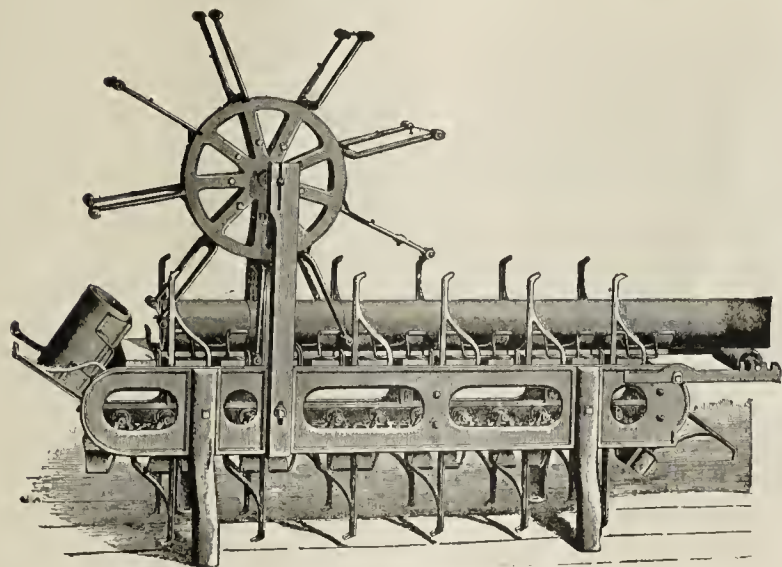
**C. & A. POTTS & CO.,**  
 816-828 West Washington St., INDIANAPOLIS, IND.



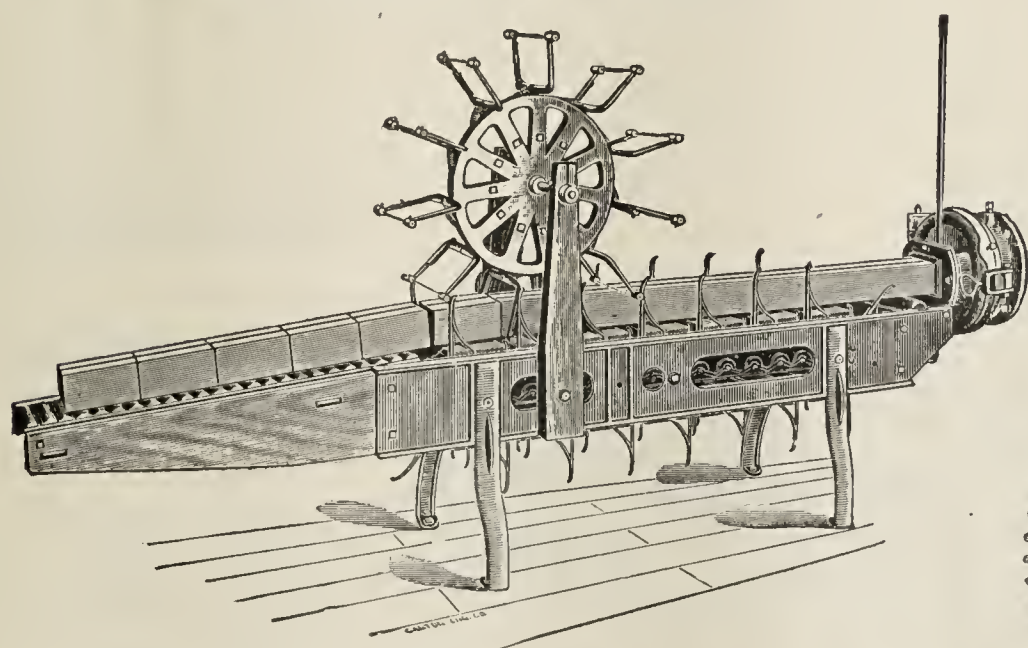
# The "PLYMOUTH."



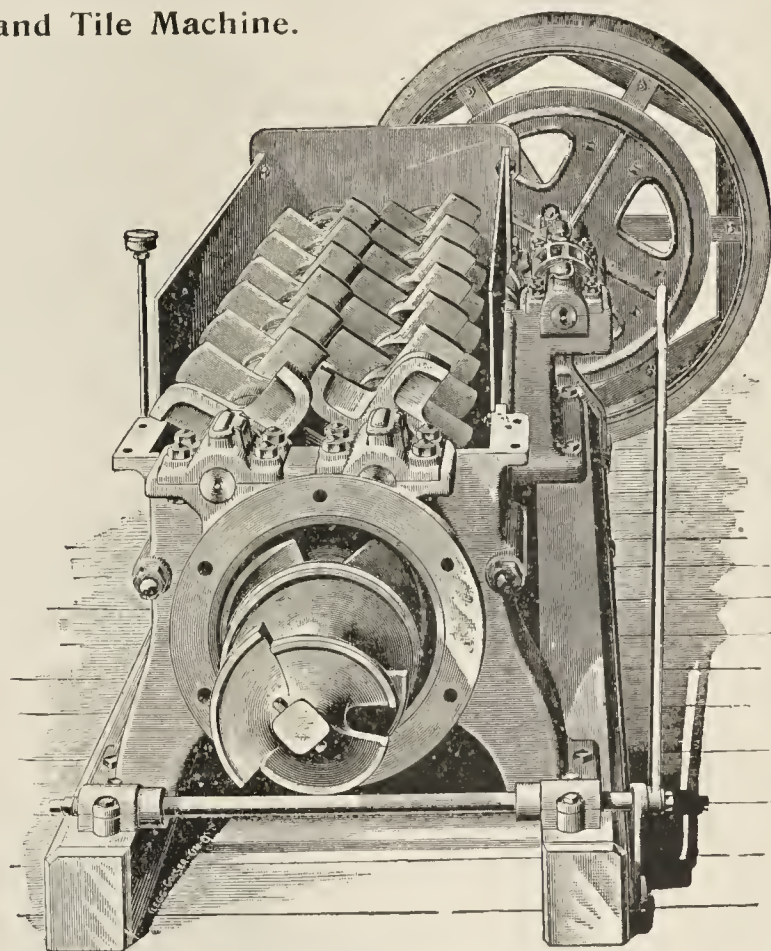
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



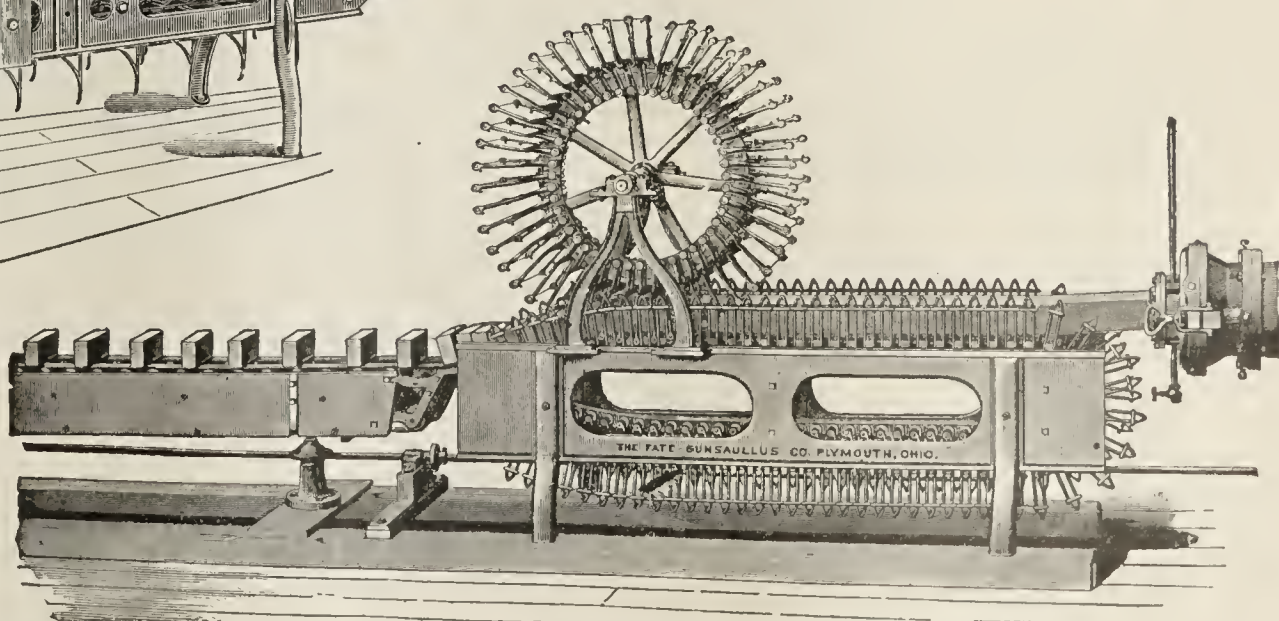
Automatic Table for Tile-2½ to 8-inch and Hollow Blocks.



Automatic End-Cut Brick Table.



"HUMMER" (Interior View.)



Automatic Side-Cut Brick Table.

Write for particulars to

**J. D. Fate & Co.,**

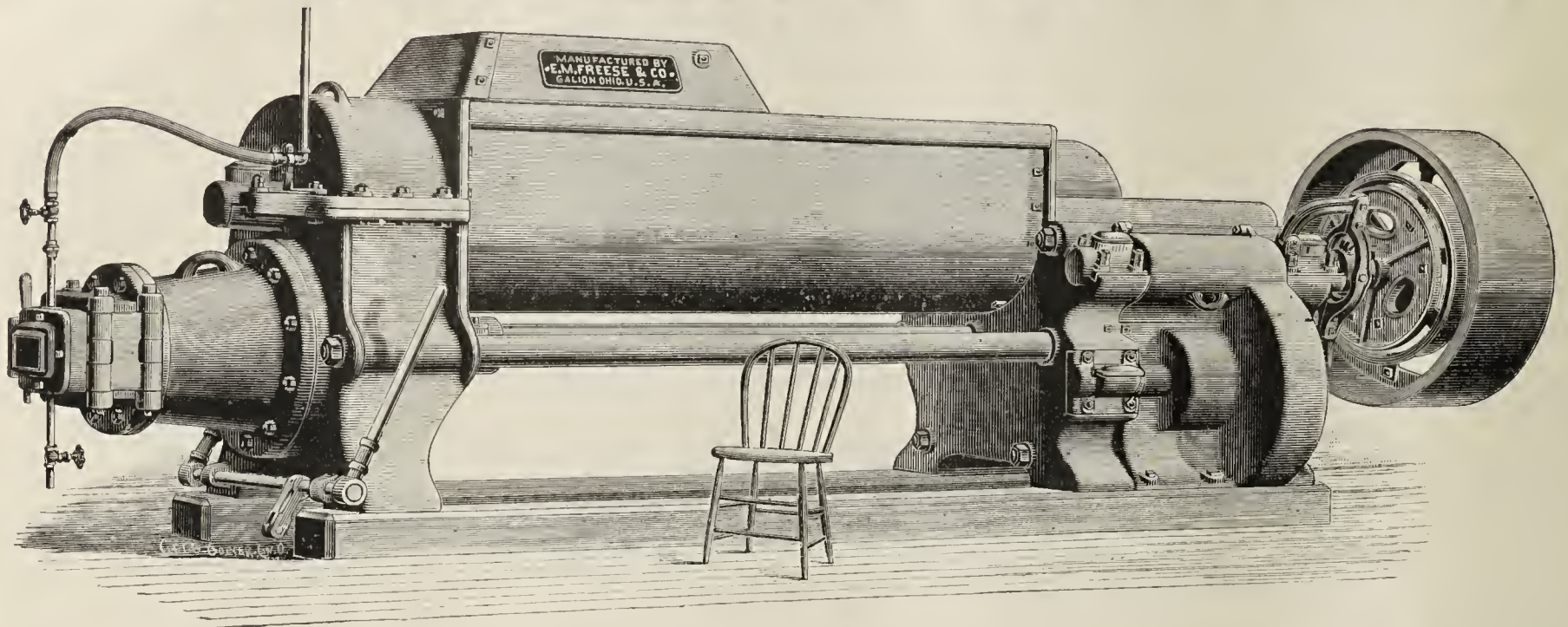
PLYMOUTH,  
Richland County, OHIO.

**B. E. LaDow,**

Special Western Representative,  
406 Chamber of Commerce Bldg., CHICAGO, ILL.

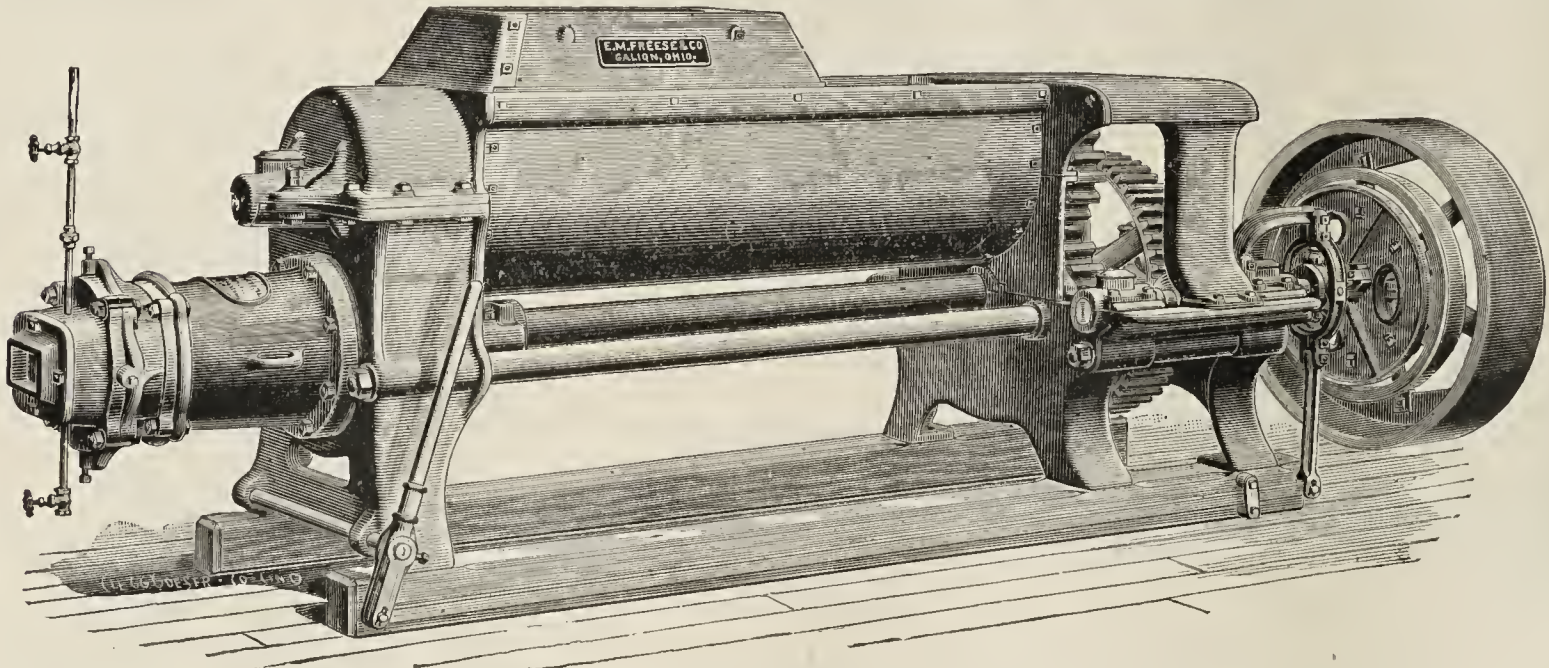


# The Original Union Brick Machines



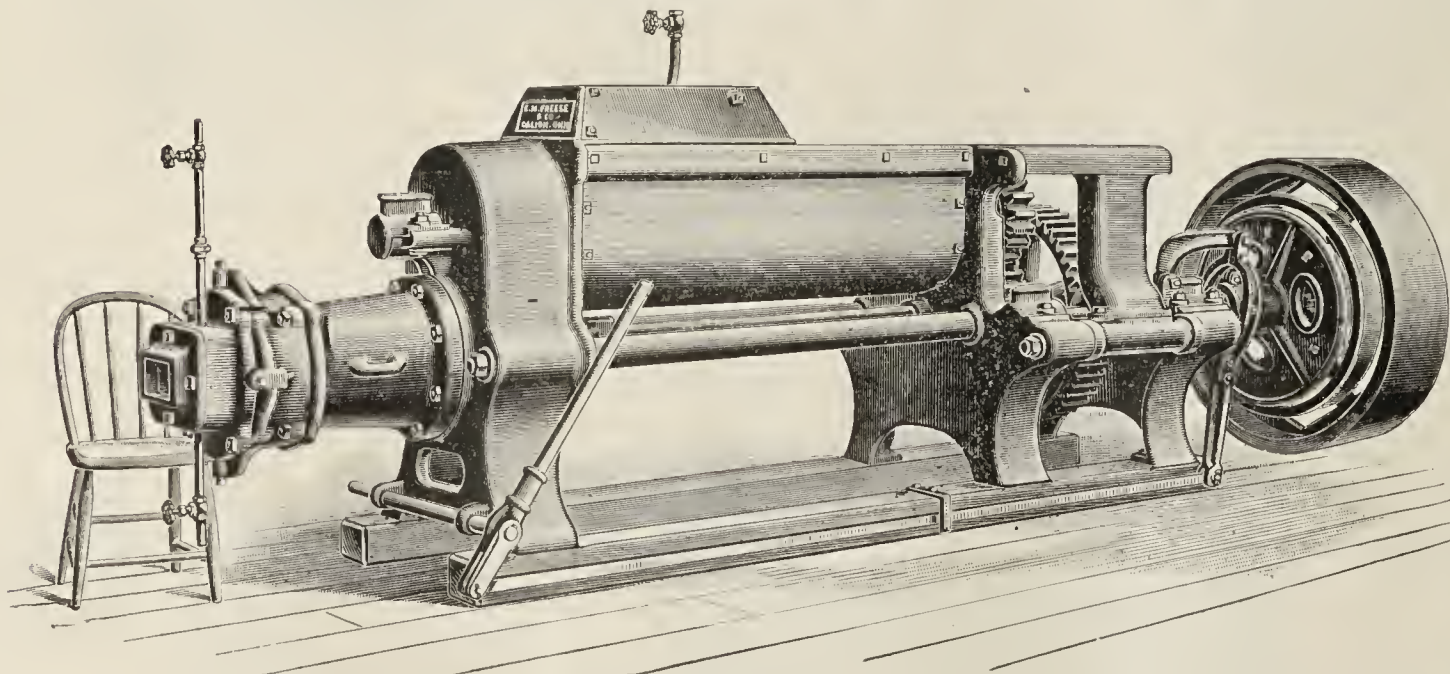
## SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



## No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



## No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

These Machines are  
NOT an experiment.

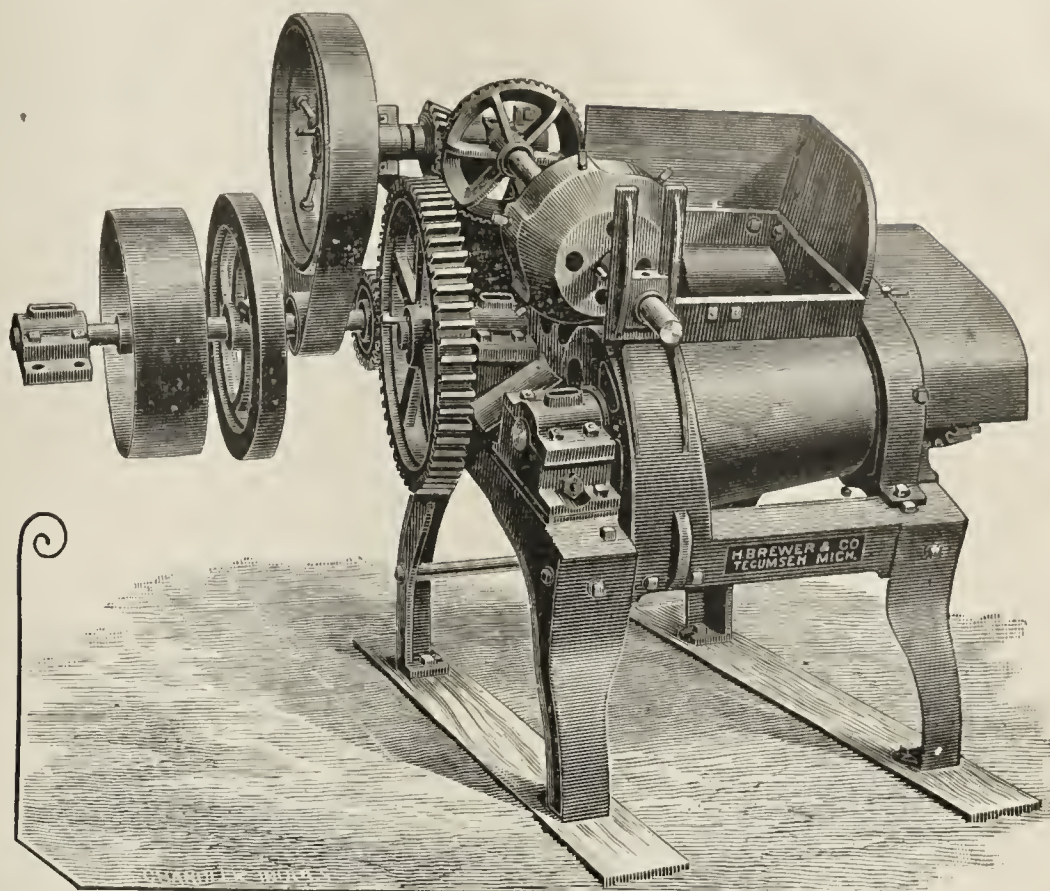
They are used in fif-  
teen States.

They are a SUCCESS  
Investigate them.

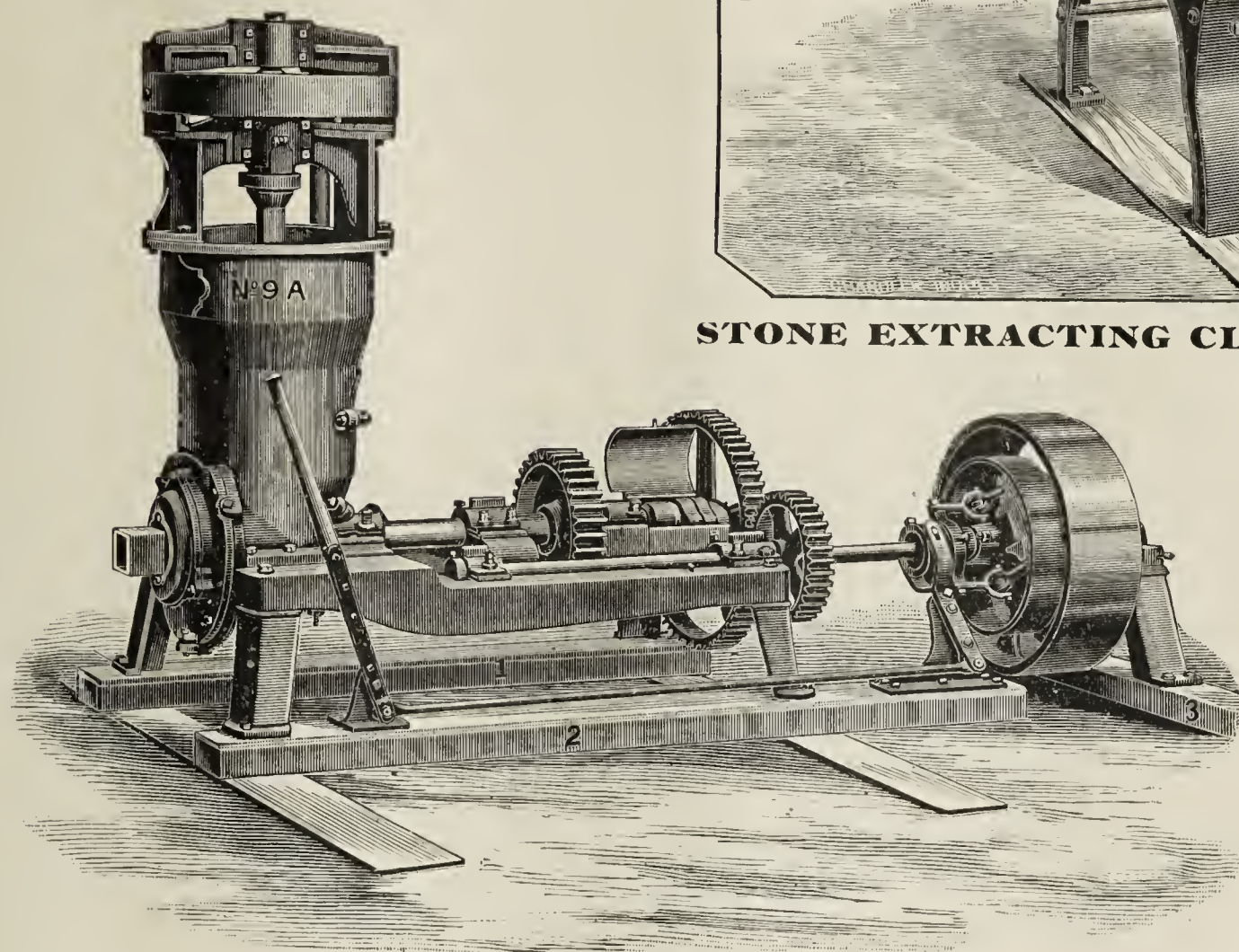
No separate Pug Mill  
required.



# Clay . . . . Working Machinery

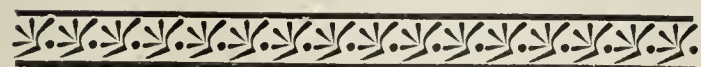


**STONE EXTRACTING CLAY CRUSHER.**



**No. 9 "A" BRICK MACHINE.**

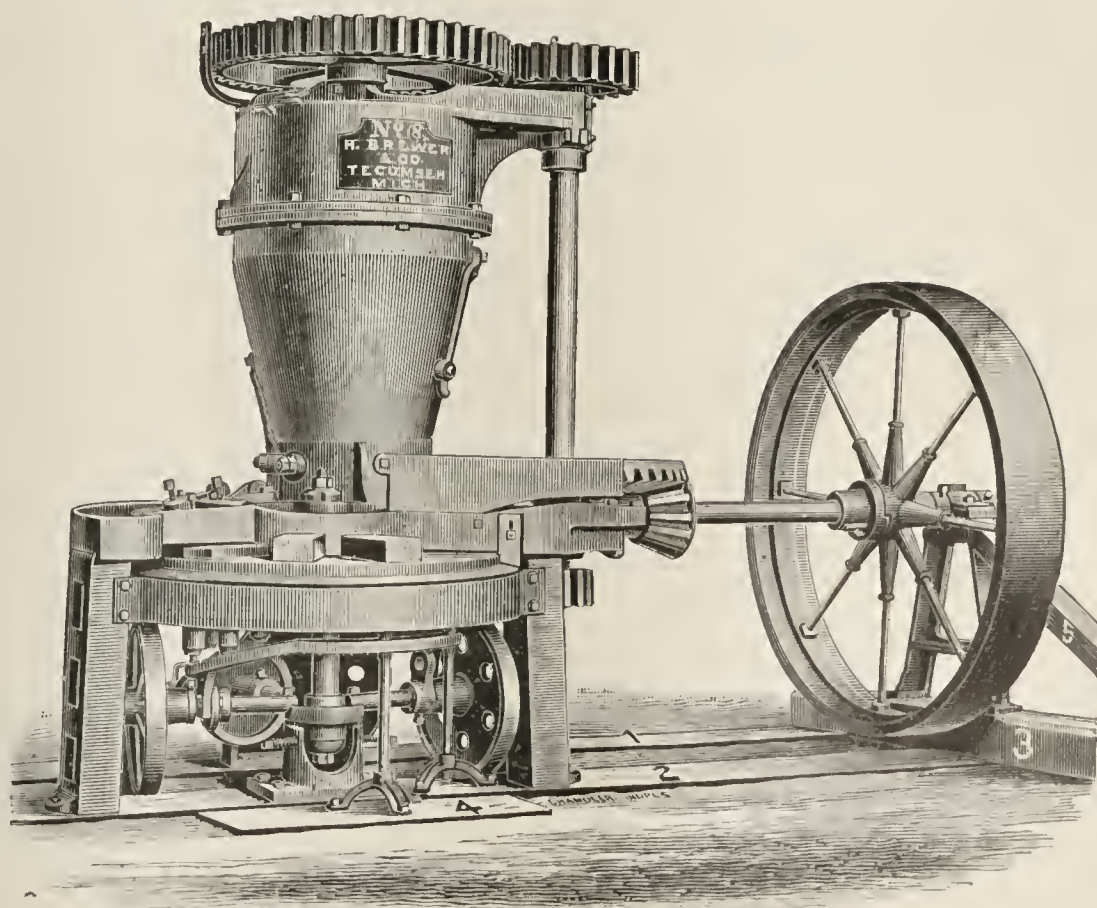
Complete  
Brick  
and  
Tile  
Outfits  
a Specialty.



*Manufactured by*

**H. Brewer  
& Co.,**

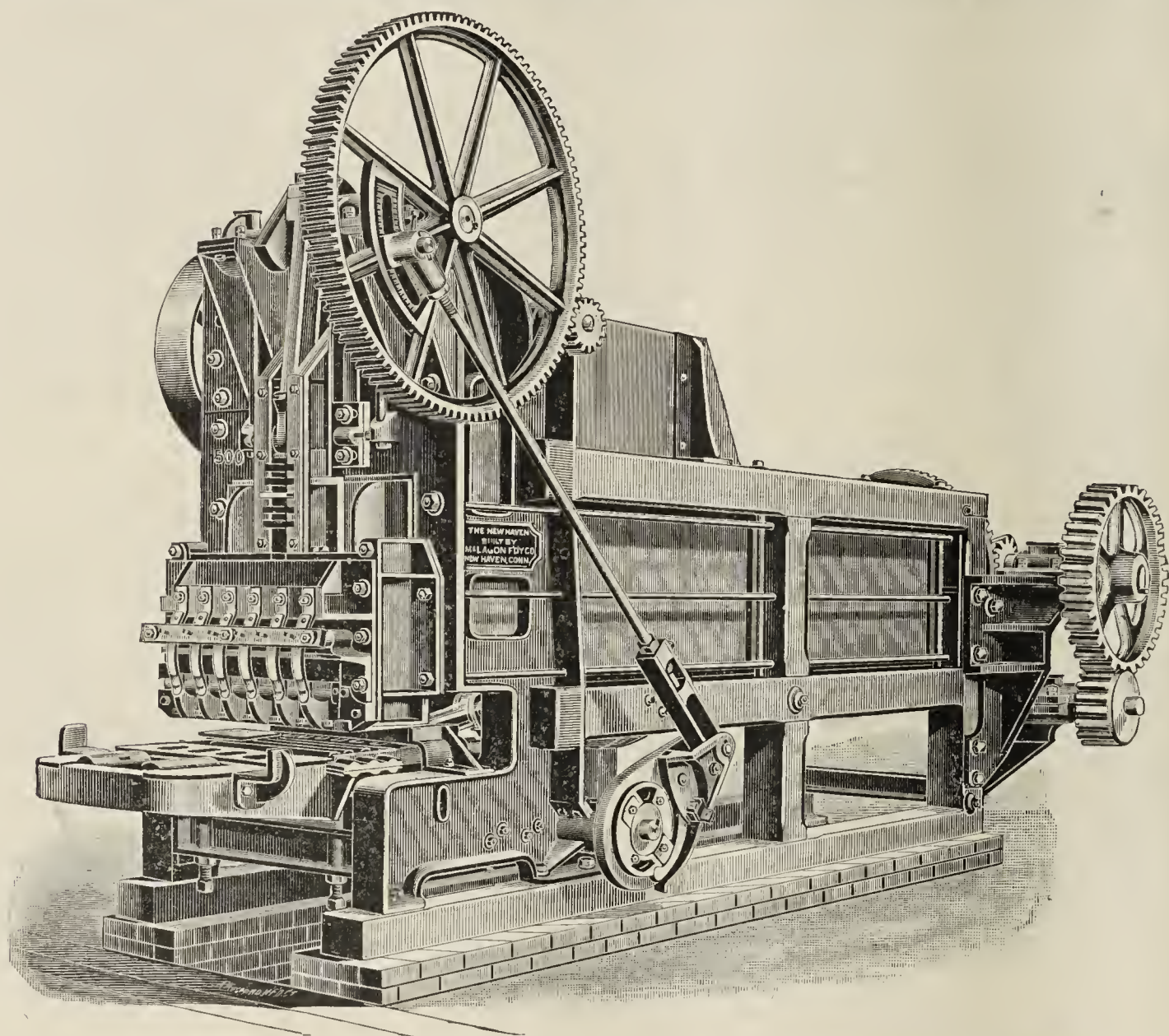
**TECUMSEH,  
. . . . MICH.**





# After Seven Years Use

Ran Just as Good as It did the First Year,  
The Second Machine also Ran Well. . . .



MIDDLETOWN, CONN., Oct. 9, 1897.

THE EASTERN MACHINERY CO., New Haven, Conn.:

Gentlemen:—Having completed the **Seventh Season** with one of your “New Haven” Horizontal Brick Machines, we take pleasure in saying that it has run **just as good this season as it did the first year we used it.**

The machine you put in for us the past Summer has also run good and smooth.

Yours respectfully,

THE TUTTLE BRICK CO.

The History of “New Haven” Brick Machines does not record a single failure.

## The Eastern Machinery Co.,

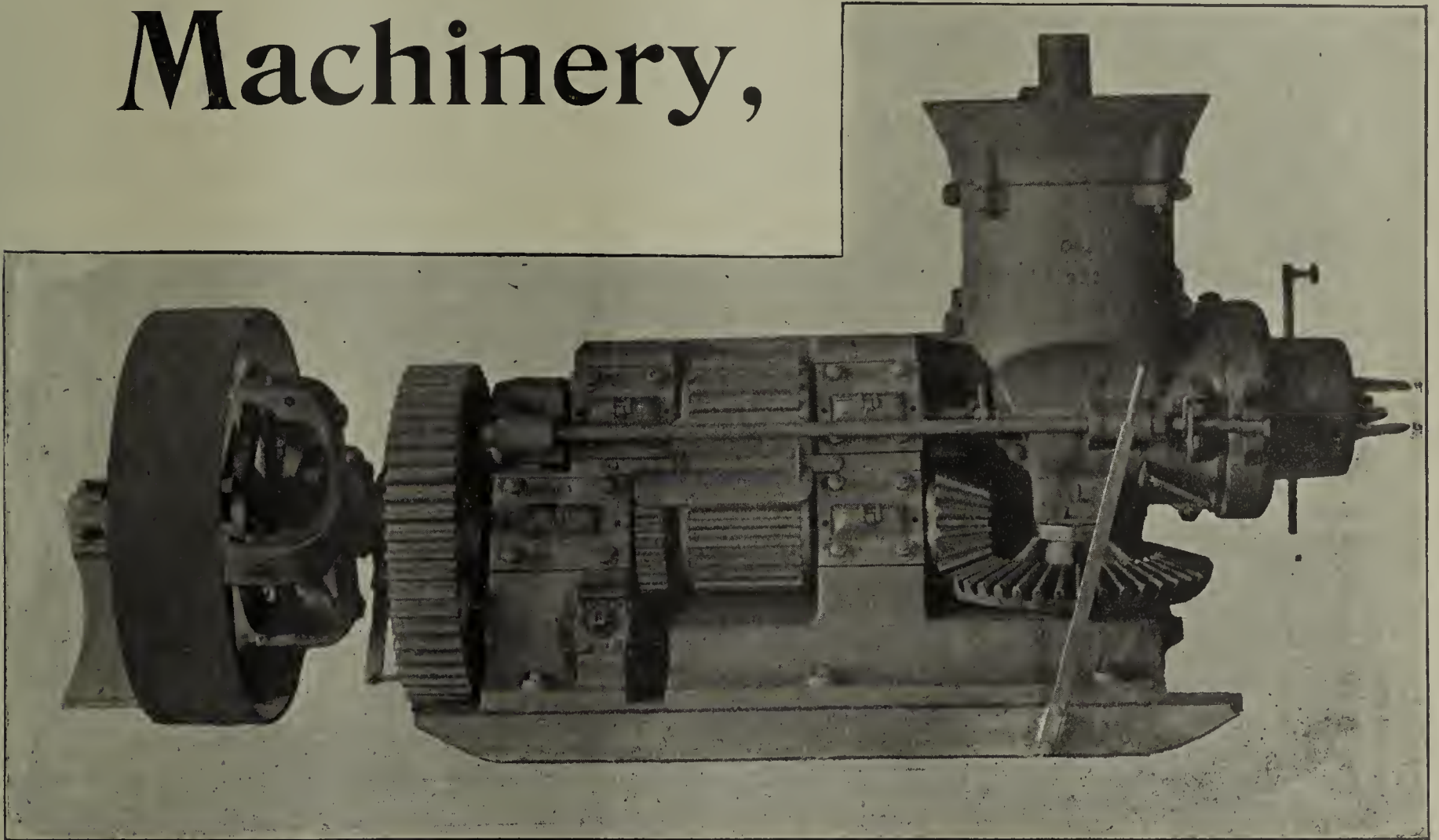
NEW HAVEN, CONN.



## What's in a Name?

A GREAT DEAL IF A THING BE WELL AND TRULY NAMED AND THIS IS TRUE OF

# Wonder Clayworking Machinery,



WHICH is so called because it has proven by actual work in various kinds of clays to have a **Wonderful** capacity, both for quantity and quality. It has a **Wonderful** pugging and tempering capacity and produces a **Wonderfully** strong brick, free from laminations, and in connection with our new automatic cutting table a **Wonderfully** straight, true brick is made of almost any clay. It is this **Wonderful** quality that enables our machinery to work successfully some clays which other auger machines can not work at all satisfactorily. This fact has been demonstrated time and time again. The users of **WONDER MACHINERY** all testify that it is well worthy of the name. They have demonstrated that it has **Wonderful** wearing qualities for which reason it is, in the long run, the best and cheapest machinery on the market.

It will afford us pleasure to send you testimonial letters attesting these facts and quote prices on individual machines or complete plants.

---

## Wallace Manufacturing Co.,

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

Frankfort, Indiana.



# Iron Clad Dryer.....IN THE LEAD

**All Dry Houses** Built in 1898

will be equipped with Important new inventions for reducing cost of drying.

...

**Steam  
Heat,  
Natural  
Draft.**



**Guaranteed** To dry soft mud, stiff mud, dry pressed brick and tile, free from white-wash, disintegration or other injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

## WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,  
Harrison 296.

CHICAGO, ILL.



## DETROIT, MICH.

**The  
Best Brick  
Dryer  
On Earth**

NOTE -

- WE DRY ENOUGH BRICKS ANNUALLY -
- TO BUILD A WALL TEN COURSES -
- HIGH FROM SAN FRANCISCO TO -
- NEW YORK -





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX, No. 1.

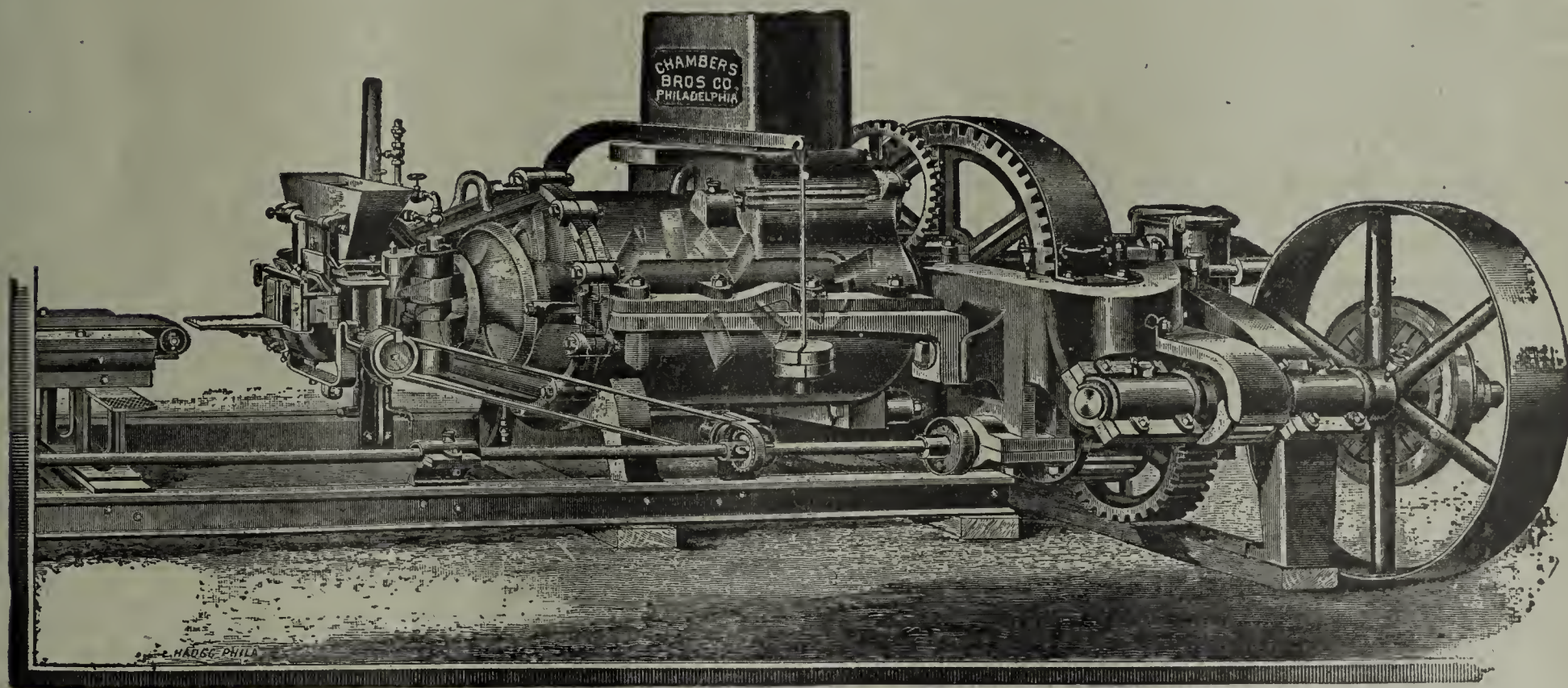
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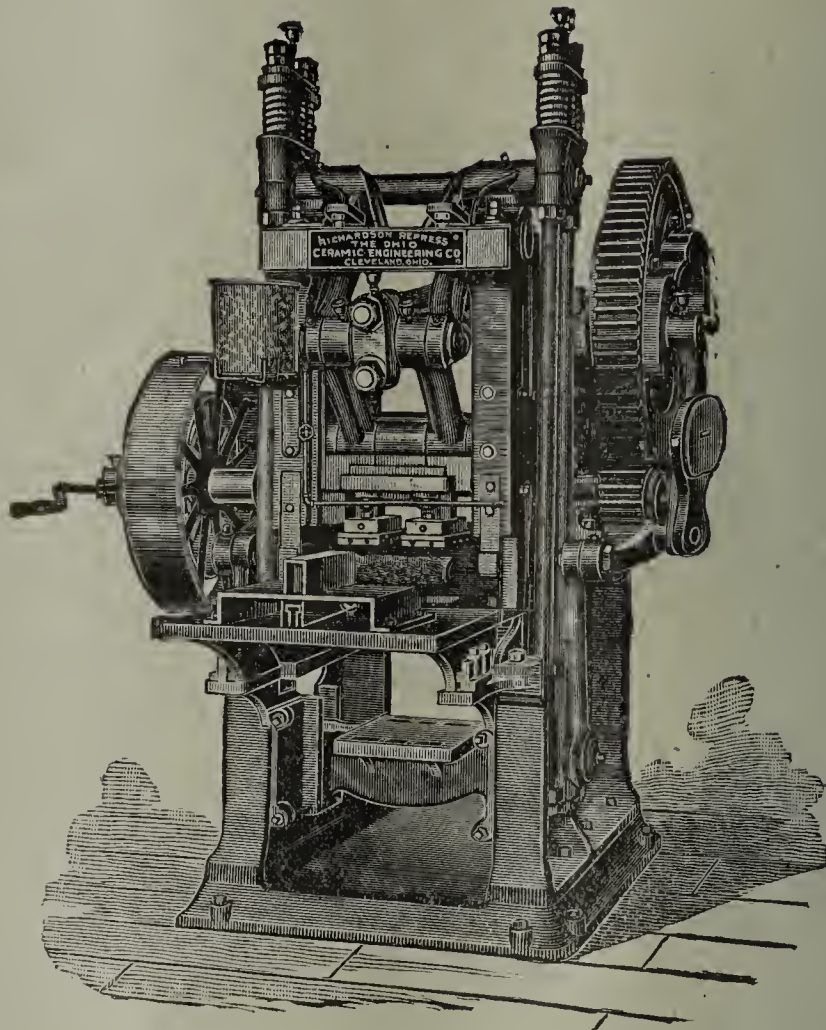
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## INDEX TO ADVERTISERS.

### Brick Machinery—Dry Press Process.

| Name.                                    | Page. | Name.                                    | Page. |
|------------------------------------------|-------|------------------------------------------|-------|
| American Clay-Working Mach Co., The..... | 75    | Progress Press Brick and Machine Co..... | ..    |
| Chisholm, Boyd & White Co., The          | 4     | Ross-Keller Brick Machine Co. ..         | ..    |
| Fernholtz Brick Press Co., The.          | 6     | Simpson Brick Press Co .....             | 5     |

### Brick and Tile Machinery.

|                                            |        |                                         |        |
|--------------------------------------------|--------|-----------------------------------------|--------|
| American Clay-Working Mach Co., The.....   | 75     | Horton Mfg Co, The.....                 | 77     |
| Anderson Foundry and Mach. Works.....      | 73     | Huetteman & Cramer Co, The..            | 67     |
| Baird and Son, H. C.....                   | 66     | Kells & Sons .....                      | 66     |
| Brewer, H. & Co .....                      | 81     | Leader Mfg. Co, The.....                | 74     |
| Central Machine Works .....                | 59     | Madden & Co.....                        | 65     |
| Chambers Brothers Co.....                  | 1, 74  | Ohio Ceramic Engineering Co., The.....  | 2      |
| Chicago Brick Machinery Co....             | 56     | Potts & Co., C. & A.....                | 76     |
| Eastern Machinery Co, The....              | 82     | Raymond & Co., C. W.....                | 51     |
| Fate & Co., The J. D.....                  | 79     | Steele, J. C., & Son.....               | 68     |
| Freese, E. M. & Co .....                   | 80     | Wallace Mfg. Co, The.....               | 57, 83 |
| Henry Martin Brick Mach. Mfg Co, The ..... | 62, 67 | Wellington Machine Co, The....          | 55     |
| Hensley, J. W.....                         | 3      | Wiles Co., A. M. & W. H .....           | 68     |
|                                            |        | Woolley Foundry and Machine Works ..... | 78     |

### Brick Kilns and Dryers.

|                                |    |                                |    |
|--------------------------------|----|--------------------------------|----|
| Alsip, S. H .....              | 69 | Morrison & Co., R. B .....     | 71 |
| American Blower Co, The.....   | 84 | Phillips, S. G.....            | 58 |
| Carson, J. W.....              | 61 | Pike, E. M.....                | 61 |
| Eudaly, W. A .....             | 71 | Reppell, L. H .....            | 69 |
| Fernholtz Brick Press Co, The. | 6  | Standard Dry Kiln Co, The..... | 8  |
| Haigh, H.....                  | 70 | Swift, F. E.....               | 62 |
| Kaul, C. F.....                | 61 | Wolff Dryer Co.....            | 84 |
| Lehmann & Co, F.....           | 70 | Yates, Alfred.....             | 64 |

### Brick Yard Supplies.

|                                              |        |                                                 |    |
|----------------------------------------------|--------|-------------------------------------------------|----|
| Arnold, D. J. C.....                         | 72     | Horton Mfg. Co, The.....                        | 77 |
| Atlas Bolt & Screw Co, The.....              | 60     | Jeffrey Manufacturing Co, The.                  | 65 |
| Carlin's Sons, Thomas .....                  | 60     | Marion Steam Shovel Co.....                     | 73 |
| Caldwell & Son Co., H. W.....                | 63     | Mershon & Co., W. B.....                        | 59 |
| Carmichael, T. W.....                        | 63     | Mey, F. H. C.....                               | 60 |
| Carnell, Geo.....                            | 69     | Newton, A. H.....                               | 65 |
| Coldewe & Co., G.....                        | 59     | Phillips & McLaren .....                        | 64 |
| Elder & Dunlap.....                          | 62     | Pittsburg Mineral Screen Company, The .....     | 62 |
| Frost Engine Co .....                        | 7      | Stedman's Machine Works.....                    | 68 |
| Harrington & King Perforating Co, The .....  | 3      | Williams Patent Crusher and Pulverizer Co ..... | 58 |
| Henry Martin Brick Machine Mfg. Co, The..... | 62, 67 |                                                 |    |

### Miscellaneous.

|                                            |        |                                      |    |
|--------------------------------------------|--------|--------------------------------------|----|
| Associated Trade & Industrial Press .....  | 66     | Indianapolis School of Medicine..... | 63 |
| Bennett & Sayer.....                       | 62     | Indiana, Decatur & Western ...       | 63 |
| Big Four R. R.....                         | 64, 65 | Illinois Central R. R .....          | 66 |
| Cincinnati, Hamilton & Dayton R. R .....   | 63     | Lake Erie & Western.....             | 65 |
| Chesapeake & Ohio R. R.....                | 65     | Main Belting Co .....                | 63 |
| Cotton Belt Route.....                     | 65     | McAvoy Vitriified Brick Co ....      | 53 |
| Dean Bros. Steam Pump Works                | 64     | Monon Route .....                    | 63 |
| Dover Fire Brick Co.....                   | 66     | Osborne, W. R.....                   | 64 |
| Evens & Howard .....                       | 59     | Purinton Paving Brick Co, The        | 53 |
| Gabriel & Schall.....                      | 61     | Royal Scribe .....                   | 64 |
| Geysbeek, S.....                           | 64     | Rockwood Mfg. Co, The.....           | 66 |
| Hay & Willits Mfg. Co .....                | 72     | Sorge, A. Jr.,.....                  | 61 |
| Indiana Bermudez Asphalt Co.               | 52     | Tennille, A. F.....                  | 62 |
| Indianapolis College of Law ...            | 60     | True, Arthur.....                    | 58 |
| Indianapolis Engraving and Electro Co..... | 62, 66 | Vandalia Line .....                  | 66 |
|                                            |        | VanDuzen Co, The E. W.....           | 60 |
|                                            |        | Wabash Railroad.....                 | 61 |
|                                            |        | Small Ads., Wanted, For Sale, etc.   |    |

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# The MONARCH

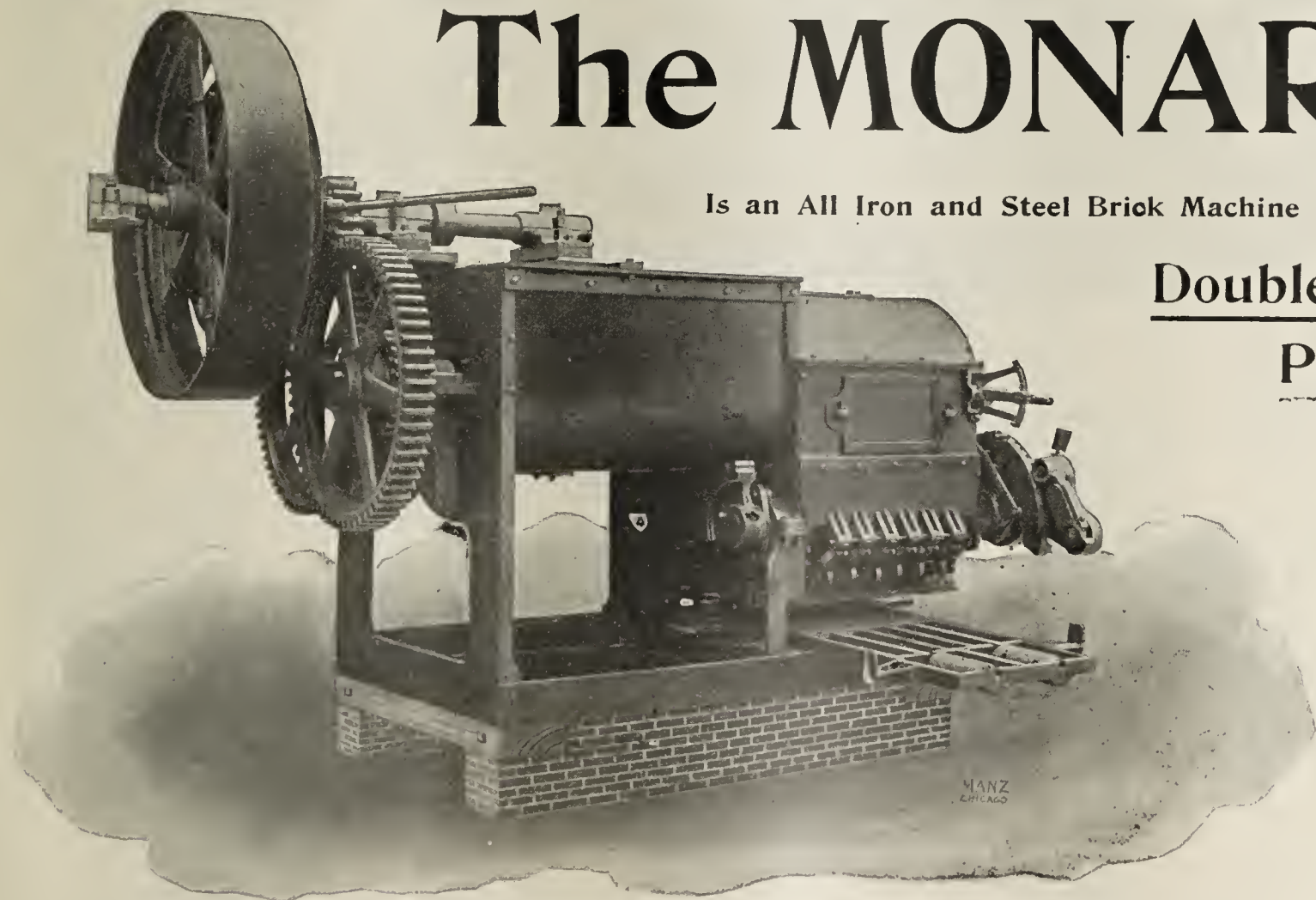
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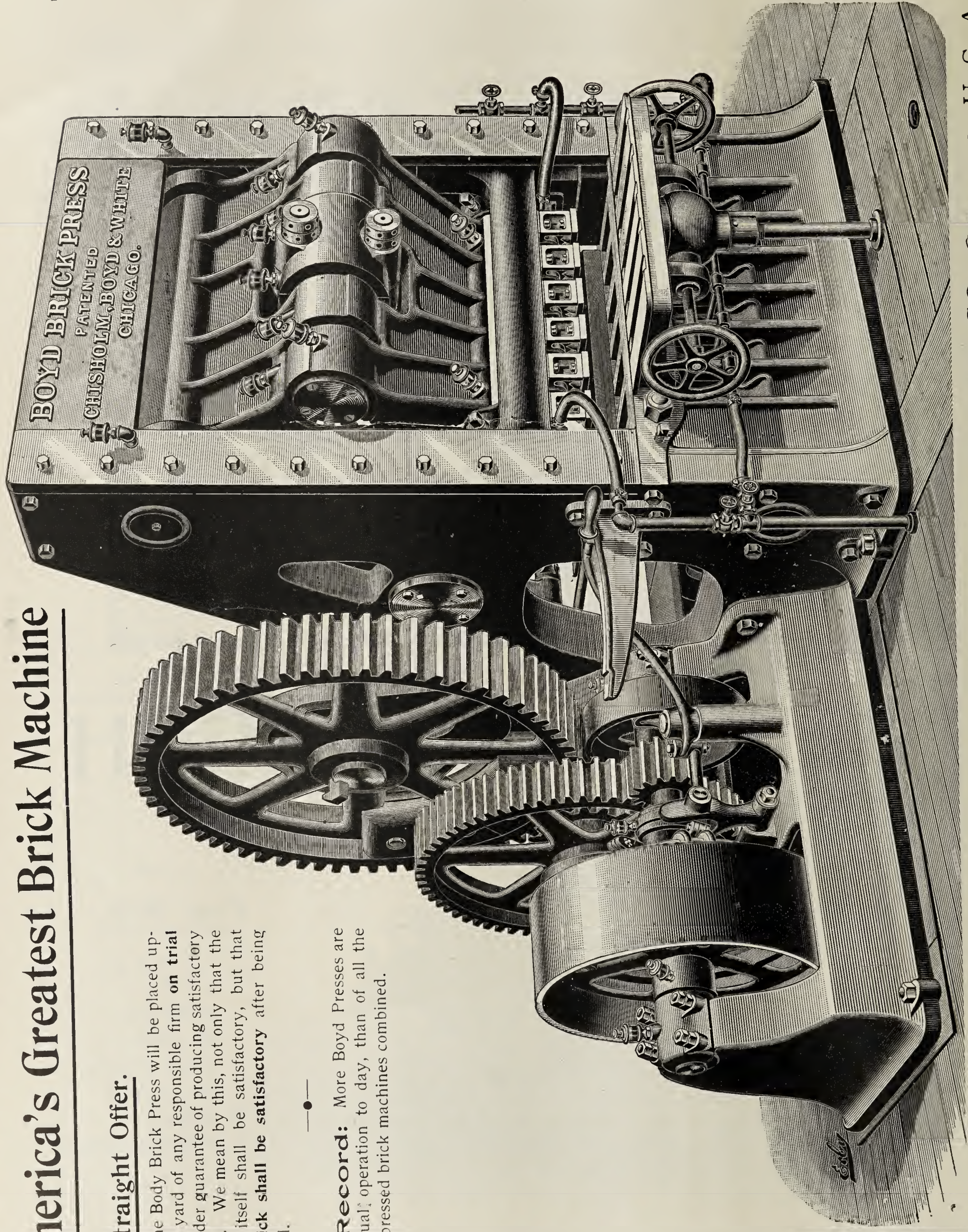


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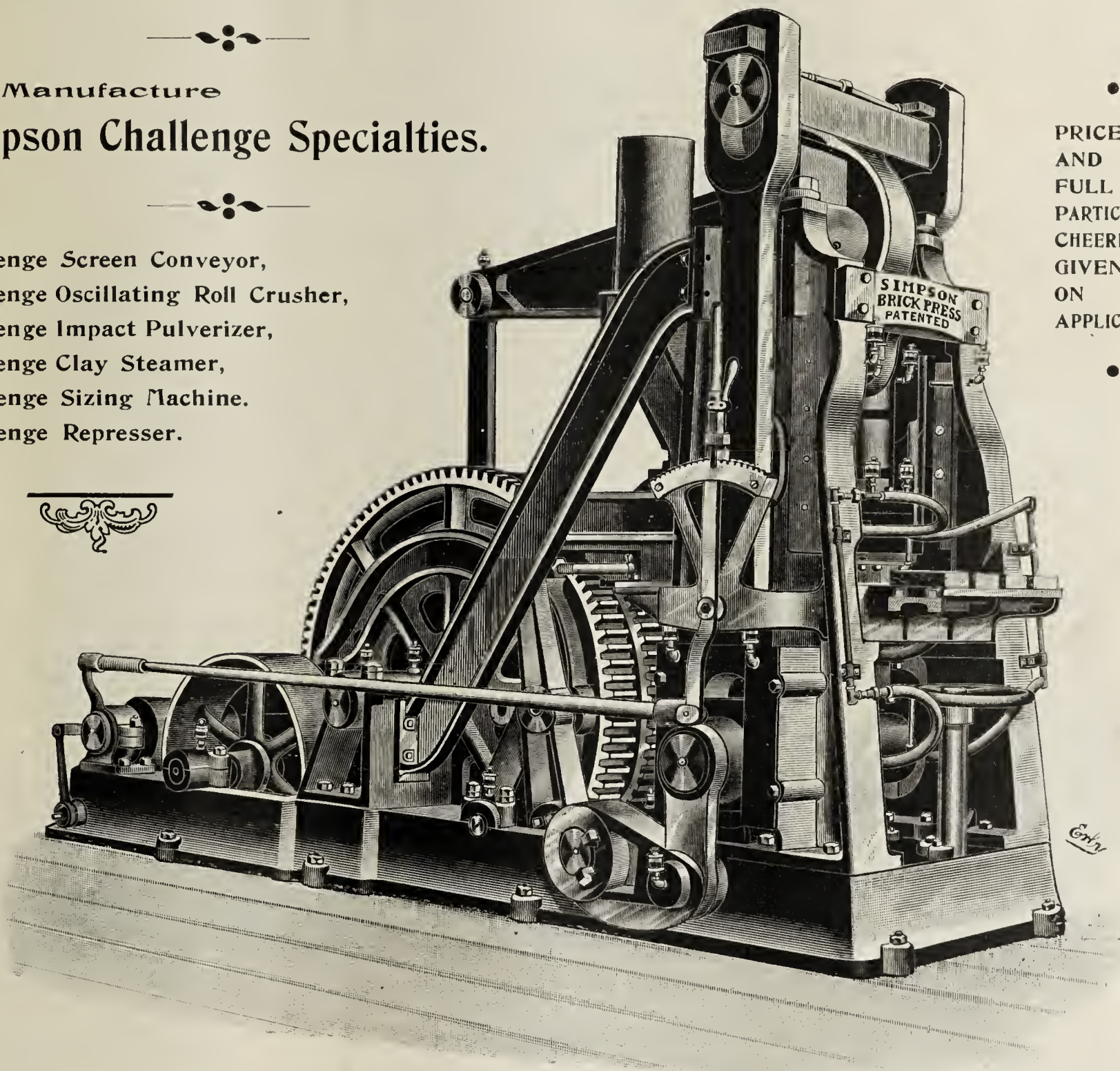
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**SIMPSON MACHINERY CO.,**

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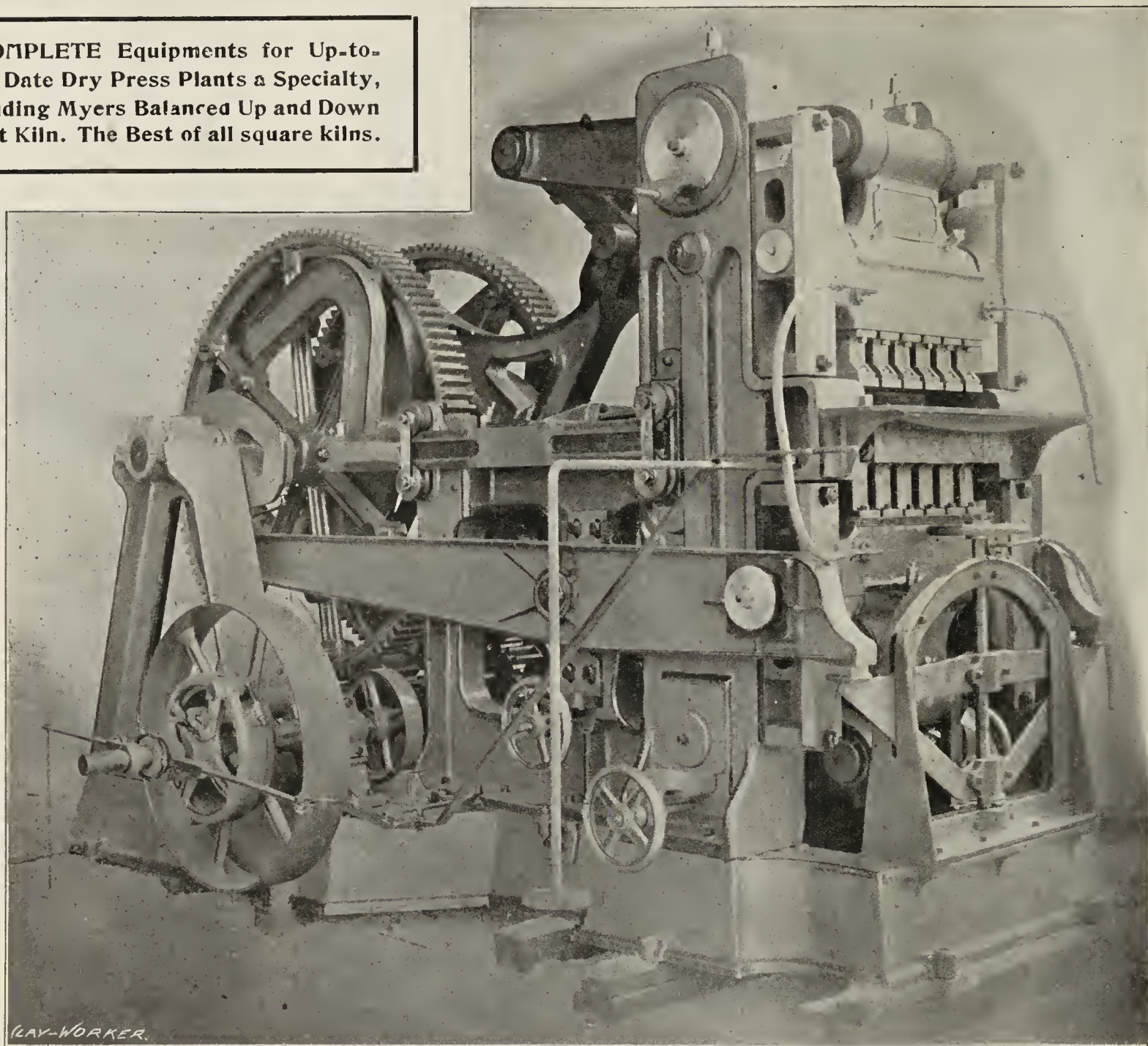
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# The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

**C**OMPLETE Equipments for Up-to-Date Dry Press Plants a Specialty, including Myers Balanced Up and Down Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

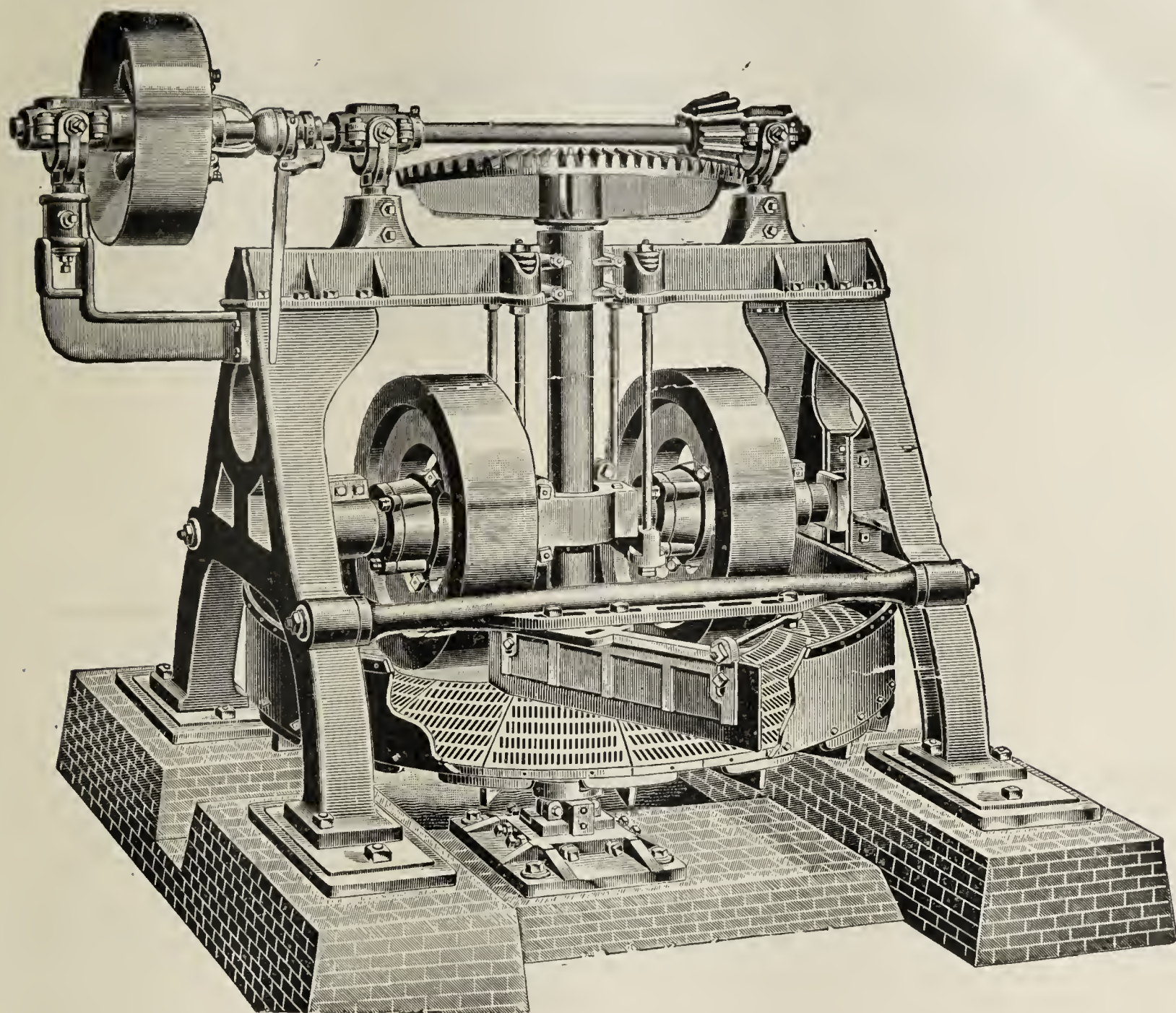
The opinion of those using our press and full information on application.

## The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

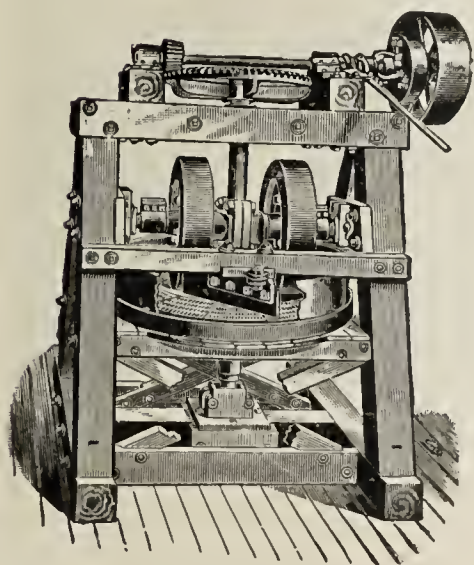
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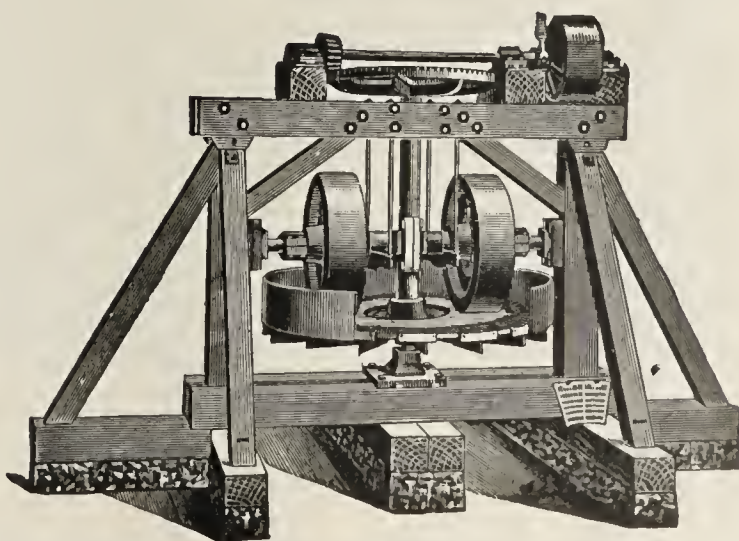
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Any Size Plant.
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Between success and failure in the brick-making business is many times in the Drier. No matter how good your clay may be, no matter how thorough your equipment may be, no matter how efficient your force may be, if your Drier isn't right, failure, in a greater or less degree will attend your efforts.

This is a logical conclusion, based on the following facts: If your Drier doesn't do its work quickly; dry your brick uniformly in a given time; prevent checking and cracking, and do it all with an economical use of steam, it will lose you money every day you operate it, and **that** means failure.

This much agreed to, the question arises, "which is the best Drier to buy," and "why?" We unhesitatingly say that



## The STANDARD IMPROVED

## BRICK AND TILE DRIER

Comes nearer being a **perfect** Drier than any other in the World. Of course we would naturally be expected to say that, because we are "interested," but why shouldn't we say it--when we have many letters from brick and tile makers in all sections of the country, which prove it?

See this is what one company thinks of **The Standard**:

THE STANDARD DRY KILN Co., Indianapolis, Ind.

In answer to your favor regarding the "Standard Drier" erected at my brick works at Maple Shade, N. J., would say;

Before putting in your Drier I was much troubled with whitewash in my brick, but this has all disappeared. I have burnt over two million brick since you put in the Drier, and have no whitewash whatever. We dry our brick very dry (25,000 every day) and presume it is carried off in the watersmoke from the Drier, as there is a vast decrease of gas from the kiln now when burning.

Your method of returning the condensed steam from the Drier back to the boiler with your Trap is perfect, working automatically, and raising the water about fifteen feet to throw it into the boiler. It requires no attention whatever.

I am glad I followed your advice and took the double deck cars, as the brick dry better, and there being less weight on each one the shrinkage can take place more naturally. The cars are entirely satisfactory, and move easy.

The Drier simplifies our business very much. I would not be without it, and consider it the **best Drier I have seen during an experience of thirty years.**

Yours respectfully,

AUGUSTUS REEVE.

Camden, N. J., Sept. 25, 1897.

Now, as this letter is but a single expression, taken from hundreds of a similar nature, does it not convince you that if you **want a Drier**, you should investigate this one?

We don't care what kind of clay you have, we will guarantee to Dry your product economically and satisfactorily.

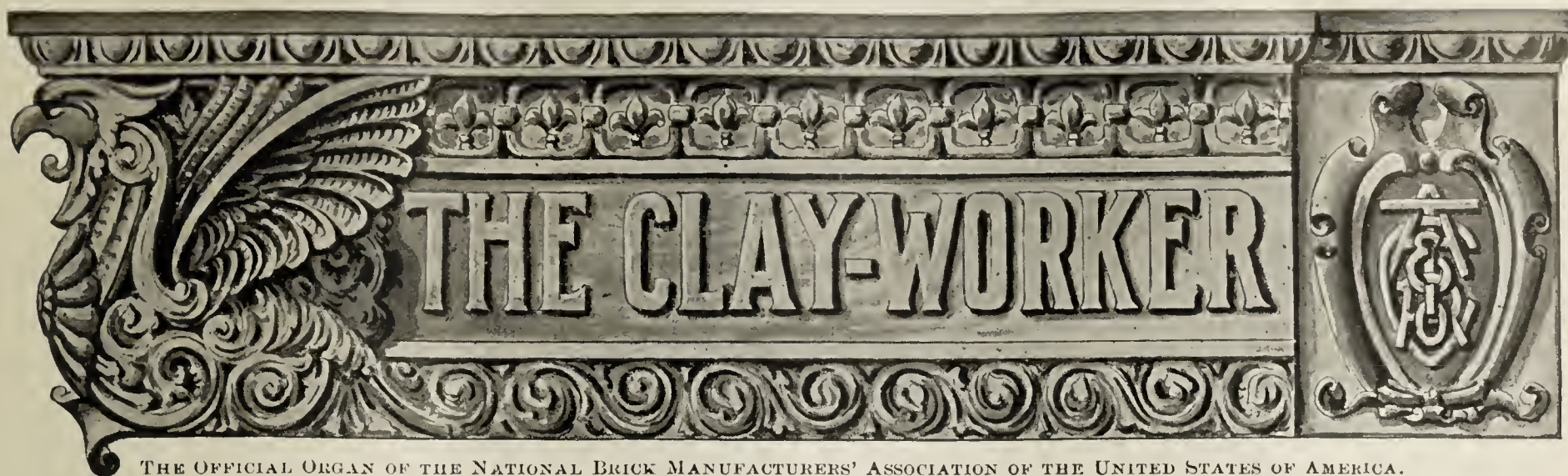
Write for catalogue, testimonials and full particulars.

# The Standard Dry Kiln Co.,

186 South Meridian Street.

INDIANAPOLIS, IND.





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX.

INDIANAPOLIS, IND., JULY, 1898.

No. 1.

Written for the CLAY-WORKER.

### CLAYWORKING IN TURKEY.

#### How Brick, Tiles and Pottery are Made in the Orient.

I HAD NOT BEEN long in Constantinople before I asked my guide what there was to show to one interested in clay working, and was told that at the upper end of the Golden Horn, where the Sweet Waters of Europe flow into it, there were large brick and tile works. Accordingly the next morning we went down to the bridge leading over to Stamboul and hired a "caïque," as the long narrow Turkish row boats are called, and after a swift row of half an hour up the Golden Horn, past mosques, curious Turkish houses and factories, we

thoroughly tempered. It was then loaded into wheel-barrows and taken to the yard where the brick were molded by hand, each one being stamped with Turkish characters. After a day in the sun, the green brick were hacked until ready for burning in small scove kilns. There was no hurry about anything, but the whole process was carried on in such a leisurely way that it was hard to believe that it was being carried on for profit. Nevertheless about 10,000,000 brick are annually manufactured in this locality.

Clay roofing tile, which are so extensively used in southern countries, are not wanting in Constantinople, for we see them on the houses, the mosques, and covering the curious bee-hive shaped roofs of the bazaars. They are unglazed, and of a curved form, but not interlocking. Many of these are also



MAKING BRICK IN THE "GOOD OLD WAY"—Tempering Clay with the Feet—A Gang of Molders.

suddenly rounded a sharp point and came in sight of our destination.

It had often seemed to me that certain portions of America could afford primitive methods of brick manufacture, but the Turks can beat us. Out in the middle of the stream was a flat-bottomed boat, in which stood a Turk with a long handled shovel digging the clay from the river bottom. When his boat was filled with clay, he rowed ashore and discharged it into a pit. Machinery was not thought of to do the pugging, but two men in bare feet trod the clay until it was considered

made at the head of Bosphorus, all of them being molded by hand.

In other branches of clay working the Turk shows more proficiency, but little originality, as he is and has been a close imitator of the Persian potter. Much pottery is made in the shops which abound in Stamboul, the native quarter of Constantinople. This ware is made from a red burning clay, which is roughly molded, and after a slight firing is turned to its proper shape on a lathe, and the surface smoothed, and even slightly polished on a leather wheel. Tea-pots, pipe bowls and



ornamental objects are turned out skillfully and quickly in great quantities, either of a plain red color or ornamented with gilt, but the most interesting objects are the Turkish coffee cups, looking like one egg cup set within another; the inner one is to hold the coffee, the outer one to serve as a handle so that the Turk will not burn his fingers.

It is in the mosques of Constantinople, as well as in the palaces, that we see some of the brilliant remnants of oriental art, viz., the glazed tiles which have been used to a greater or less extent throughout the far East since remote times, and indicate vividly to us the high degree of oriental taste in surface decoration, by the use of these siliceous glazed tiles for both interior and exterior wall space. At most localities in Turkey they are found in the ruins, but in Constantinople they are still to be seen in an excellent state of preservation, as in the mosque of Sultan Ahmed, where much of the interior wall is covered with them, or in the old palace of the Seraglio, where some of the tiles are nearly two feet square, covered with the most elegant arabesque diapering of foliage and flowers intertwined, among which insects and birds are depicted. The only doubt in our minds is that some of these may be the work of a Persian potter, for, as before stated, the Turks have been such close imitators of the Persians that it is often difficult to distinguish.

These tiles are molded in wooden forms by hand and then laid out in the sun to dry. When stiff enough to handle they are stood on edge in rows and dried still further. The body is generally of a white burning clay, covered with a tin glaze, while the decorative pattern is blue, with occasionally some yellow or red. The decoration is underglaze, and the latter is usually badly crazed.

Those in the mosque of Sultan Ahmed, shown in the illustration, are all blue and white.

Sometimes the tiles used for border work have a raised band, variously ornamented, which is molded separately.

These majolica tiles are used both exteriorly and interiorly, and the majority of them are eight or nine inches square, and three-eighths to one-half thick.

The Turkish potter is, however, producing some very creditable imitations of Persian faience, and at Kuthia, in Central Turkey, there is an active center of production of majolica tiles and vases. The vases are decorated in a similar manner to the tiles, but the pattern is usually finer, and the variety of colors greater. They are turned on a wheel.

As we passed through the Dardanelles, on our way from Constantinople to Athens, our steamer was met by numerous small peddling boats containing some highly unique jugs made by the natives of that region. They were tall, with a narrow neck and low body, and covered all over with a coat of shining black enamel, while modeled over this were flowers and leaves of bright red and yellow. These jugs being porous, and unglazed on the bottom, they are much used by the peasantry of that warm country to keep their drinking water cool, and every steerage passenger on the steamer was supplied with one.

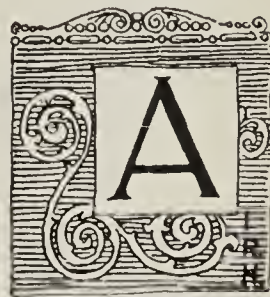
HEINRICH.

There is such a thing as being very shrewd and yet very short sighted—very energetic and yet sadly lacking in executive wisdom—very secretive, yet generally exposed—very wide in action, yet very narrow in sentiment—very ambitious, yet perpetually stumbling over the steps that should lead easily up to Fame's temple.—Artemus Ward in Fame.

Written for the CLAY-WORKER.

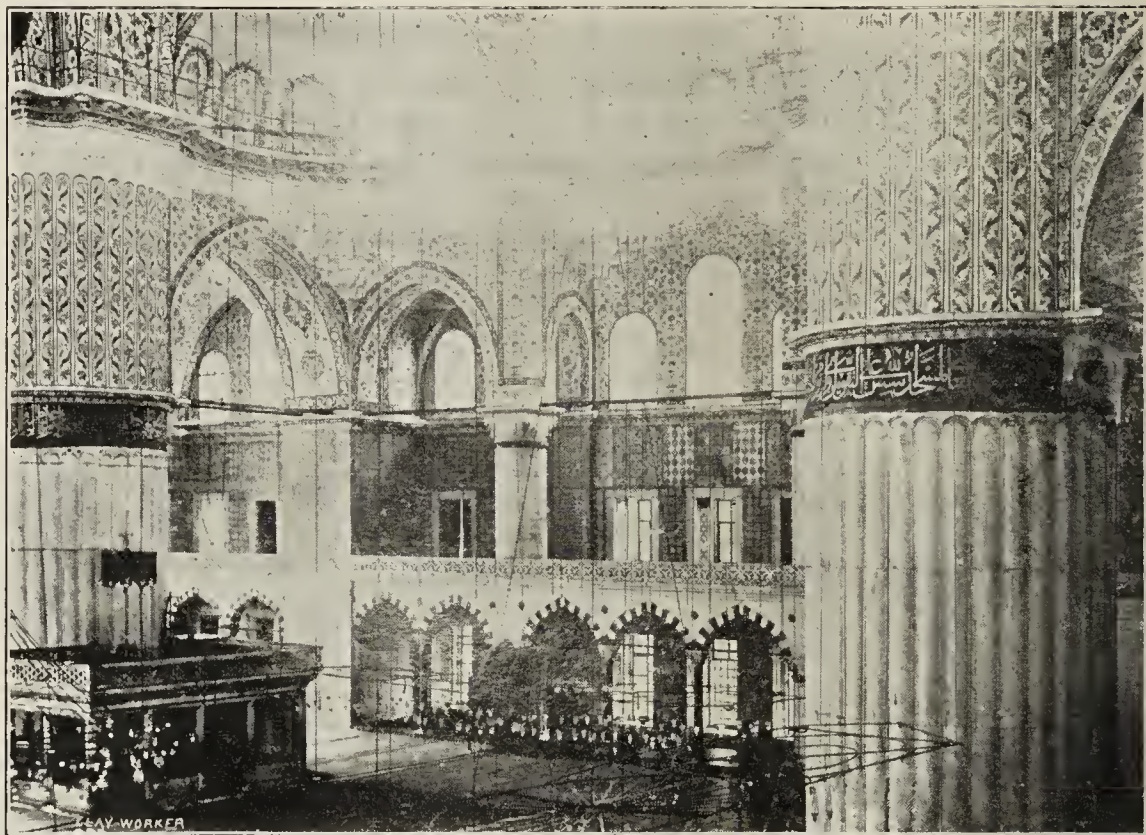
## ARTIFICIAL POTTERY BODIES.

S. GEYSBEEK.



ABOUT A CENTURY and a half ago, kaolin was discovered in Europe. Before that time the Oriental porcelain, which was brought to these countries by the Portuguese, and which was commonly known under the name of porcelain, excited the unbounded admiration of all classes. The potters in Europe left no effort untried to discover ways and means to reproduce this Oriental porcelain, before the kaolin was discovered.

The French and the English discovered about the same time a way to reproduce this Oriental porcelain. The English ware was called "Soft Porcelain," and the French called their's "Porcelain Tendre." The names "soft and tendre" do not mean that the body was of a lesser quality than the Oriental porcelain, but that it was not so resistant to the action of high temperatures, and that it melted much quicker than the hard



INTERIOR OF MOSQUE OF SULTAN AHMED, CONSTANTINOPLE; Showing Decoration of Majolica Tile.

or Oriental porcelain, and second that the glaze was attacked by acids. The first English ware of this kind was manufactured by the potteries of Bow and Chelsea about 1745. In 1751 the art of making this soft porcelain was introduced in Worcester by Doctor Wales.

They first used sand from the Island Wight, some plastic clay, and the greater part of the mixture was broken flint glass. In 1768, however, after the discovering of the Cornish stone, the mixture was greatly changed, and from that time the ware has a right to be called "Porcelain." Another change took place in 1800, when Spode introduced the use of bone in pottery bodies. So they changed from a partly artificial body to a true hard porcelain body, without having given the first a good chance to show what could be done in that line.

The French were not as lucky in discovering at an early date a material which could be used as kaolin in bodies. They tried several times to make bodies of plastic clay material, but without any success. Finally they took to artificial means altogether, and the results were astonishing. The "Porcelain Tendre" of 1750-1800 is still to-day regarded as a class of pottery ware, which in finish and in color is as perfect as any ware made at the present time.



The result, the invention of this artificial imitation of the hard porcelain, became soon the basis of a great manufacturing source in France. It continued for over half a century, and is commonly known as "Porcelain Tendre" of the Royal Porcelain Manufactory of Sevres.

In composition it was quite different from the English soft porcelain. It did not contain any clay or feldspar, the most essential features of hard porcelain. Its composition was subject to variations from time to time. It contained saltpetre, soda, alumn, plaster of Paris and other ingredients. Its plasticity was introduced by the use of some sticking substances, usually soap. It was very hard on the workmen, and was considered very unhealthy work. The making of the body was very complicated, and after fritting and grinding, there were several obstacles to overcome. The moulding and making of the ware, too, had its technical difficulties, but the results were very good, and the finish of the ware was excellent.

The following composition was in general use in Sevres:

|                      |     |
|----------------------|-----|
| Saltpetre .....      | 220 |
| Common sea salt..... | 72  |
| Alumn .....          | 36  |
| Soda of Alicant..... | 36  |



POTTERY STORE IN STAMBOUL, THE NATIVE QUARTER OF CONSTANTINOPLE.

|                           |      |
|---------------------------|------|
| Plaster of Paris.....     | 36   |
| Sand of Fontainbleau..... | 600  |
|                           | 1000 |

This mixture constituted the frit, and the body, which was called "Porcelain Tendre," was prepared from this frit by the addition of white chalk and calcareous marls from the gypseous earth of Argenteuil, and mixed in the following proportions:

|                     |            |
|---------------------|------------|
| Frit .....          | 750 or 900 |
| White chalk.....    | 170 or 200 |
| Gypseous earth..... | 80 or 100  |
|                     | 1000 1200  |

The whiteness and consistency or hardness of this body was regulated by varying the proportion of chalk.

All these materials were intimately mixed together, ground with water in a mill, and finally passed through silk sieves. Dried and mixed with the sticking material and used in this plastic state.

The glaze for this porcelain tendre had the following composition:

|                                   |      |
|-----------------------------------|------|
| Litharge .....                    | 380  |
| Calcined sand of Fontainbleau.... | 270  |
| Calcined silica.....              | 110  |
| Carbonate of potash.....          | 150  |
| Carbonate of soda.....            | 90   |
|                                   | 1000 |

The glaze materials were well mixed, fritted, ground, and washed, fritted again, and ground, and dried and ready for use.

The body after all was so entirely lacking plasticity and consistency that it could not be worked on a potter's wheel, and could hardly be moulded without difficulty.

To give it sufficient tenacity and plasticity to prevent it from cracking or crumbling to pieces in the process of moulding, it was mixed with about fifteen per cent. of its weight of a mixture of black soap, and parchment size, the soap at a latter period being replaced by a solution of tragacanth gum, to which are attributed the saline efflorescences which were occasionally manifested on the made ware. In the process of turning a saline and silicious dust was produced, which was extremely injurious to the potters, and caused asthmatic and pulmonary complaints. This was one of the main reasons why the fabrication of tender porcelain was the more readily discontinued after the discovery of kaolin.

Owing to the want of plasticity and cohesion in this artificial body, great difficulties were encountered in the several stages of its manufacture. The want of tenacity rendered it necessary, when the articles were placed in the kiln to support all the projecting parts during the process of burning, and in order that the forms of these parts might not be disfigured, it was necessary that their supports should be made of the same body as the ware itself, so that the whole mass, including the supports, would shrink in the same proportion. The moulding of these supports added to the difficulty of the manufacturing. The linear dimensions contracted in the firing about one-seventh, and consequently the ware looked much smaller after it was burned.

The firing or burning of this porcelain tendre took longer than the hard porcelain, it took from 75 to 100 hours to burn the ware to a good biscuit. In the biscuit fire it became hard and got its translucency. The glazing was done by dipping

or sprinkling it on. The ware was put in the glost kiln without support, and the heat did not go as high as in the biscuit. It took from 24 to 30 hours to burn the glost kiln. Shivering or crazing was very seldom encountered. The colors for decorating this kind of porcelain were specially prepared, and their use was fast unlimited.

The very defects of this artificial porcelain conferred upon it some advantages in its decoration over the real hard porcelain made from kaolin and feldspar. The softness of the glaze allowed the colors used on it to penetrate it more or less, and assume the appearance of being incorporated with the same. It had the same effect as if they were underglazed, retaining nevertheless the most perfect brilliancy. This is an effect difficult to obtain, owing to the facility with which the coloring material is affected by the solving constituents of the glaze. This brilliant effect has not reappeared in the ware produced by the Sevres pottery since the manufacture of the porcelain tendre was discontinued there.

Although this artificial body contained none of the essential ingredients of true hard porcelain, and ought not, therefore, ever to have received the name or to be regarded as anything near like it, it stills shows up as one of the seldom imitations



of the science of art. At the same time it must be admitted to be in its superior and external qualities a beautiful copy of a beautiful original (Oriental porcelain), and required in its preparation and manufacturing much more profound resources of science, art and knowledge, than what is composed chiefly of ingredients which nature presents nearly in the state in which they are employed in the natural body of hard porcelain. To discover and skilfully combine the complicated elements of this artificial porcelain required patient research, great chemical skill, much knowledge, perseverance and genius, while the casual discovery of a vein of kaolin or feldspar would have at once enabled the potter, already master in his art, to manufacture true hard porcelain, so long a mystery to the European potter.

Written for the CLAY-WORKER.

#### BUTTON-HOLE TALKS.



EATED IN MY OFFICE I was doing a sum in subtraction, which nowadays seems to be my regular occupation, and at which I am getting to be quite expert, notwithstanding that back in the old school days I had concluded never to make any use at all of subtraction. That was way back in those days of sunburnt noses and stone-bruised heels, where boy life was rampant and free, and the sign of the two fingers for the swimming-hole was frequent and dominant. In those days I abhorred subtraction. Addition and multiplication were the only branches of mathematics that I proposed using, but I had no place for subtraction, and intended in future life to shun its use.

But how things change. Our plans are reversed. For addition and multiplication I have had but little use, except as to cares and troubles, and since my advent into the field of the clayworker, I have, in business matters, used subtraction almost continuously. And so as I said I was busy, as usual, doing a sum in subtraction, when a visitor appeared and introduced himself.

"Now you wrote in the 'Clay-Worker.'" said he, "that none of the brethren should go through the city without stopping to see you, and so you yourself are to blame for my visit, as I am only taking you at your word. I have read lots of your stuff in the paper and have come in here to talk to you.

"Lost my hearing a few years ago and am deaf as a post, so there's no use of your talking for I couldn't hear you if you did, so I will just do all the talking this trip myself.

"I attended one of the conventions years ago, and then lost my hearing. What are you grinning at? It wasn't attending that convention that made me deaf. Didn't think you were so quick with your inferences. No, something went wrong in my head, and I 'rung off' connections with the outside world.

"You have no idea though how I live over that convention time and again. No use of my going to any more when I can't hear, for it would be too much of an aggravation. So I live that one over and over again, and wait for the reports of the new conventions in the 'Clay-Worker.' Reading these reports is the event of the year for me. I read and I reread, and I picture the scenes with the old war horses I saw in 'My Convention.' Oh how well I know them, though they don't know me at all. I revel in this report and live in it. I talk it over with my wife. Yes talk it over. No lack of ear apparatus can prevent our understanding each other. Gates, you wouldn't think it, and I myself can't explain it or see how it could have come about, but I have an angel keeping house for me at home. Just think of a rough, homely, fraction of a man like me having one of God's best angels to cook his cakes and

make his coffee, and to look with her pure, patient, loving eyes past the rough outer covering and see something way down in the heart of such a man as I am that she can love. Have an angel to pet and nurse you. Why I need no ears for her. My eyes tell me every wish and thought of hers. I could tell without eyes, for I know when she comes and goes in the dark, I know where she is and what she is doing, for the love is so great that our understanding each for the other is perfect beyond the senses.

"We have talked these conventions over, and read them until the leaves of the reports are almost worn out, and she knows the members in a way that would surprise you, but all the while I know I am missing the best part of the whole business. The sessions are glorious with their papers and discussions, but the other part, the meeting of brothers from the East and from the West, from the North and from the South, taking them by the hand, looking into their eyes, getting to know each the other. Comparing notes, and generally forming and cementing friendships, and having the jolliest, happiest, most profitable time imaginable, and then taking home all these recollections with the knowledge that we can at any



TURKISH COFFEE CUP, made in Constantinople—MAJOLICA VASE, made at Kutahia, Turkey. See page 9.

time write to these, our brothers, and get help from the stores of their information or encouragement from their experience. Taking home a light heart, renewed courage, and a head stored with a whole lot of new ideas.

"I am cut off from this and so I know its true value more and better than you fellows who can take it all in.

"But I must go now, but I want to say this. My little place is miles from the railroad, my yard small, I am one of the little fellows you know, but whenever you can get down to that station, I just want you to hire a livery at my expense and come and see me. You shall have the best we have, and I will guarantee the best cooked dinner you ever ate, for my wife can cook, I just tell you; found out how she could cook before I married her, you know." He poked me in the ribs, chuckled and was gone.

GATES.

There is such a thing as being penny wise and pound foolish; in pounding a man in order to prove one's power to get a penny reduction, while the contempt and ill-will that results grows into an interest-bearing debt of many pounds sterling.



## THE CLAYS AND CLAY INDUSTRIES OF NORTH-WESTERN INDIANA.\*

BY W. S. BLATCHLEY.



URING THE PAST FIVE years the clay industries of Indiana have had a steady growth. The ever increasing demand for clay products for structural and road uses has been the chief incentive to this growth. The rapid advancement in the price of lumber, due to the disappearance of the forests of the State, has led architects and builders to investigate more carefully than ever before the advantages of clay products for structural purposes. These investigations have, for the most part, proven satisfactory, and have shown the unexcelled fitness of such products for many uses to which stone, wood or other materials were previously put.

As a proof that the general public is beginning to appreciate this fitness, one has but to note the rapidly increasing use of terra cotta and pressed brick for the fronts of business blocks and the more fashionable and costly private residences; of hollow brick for their partition walls; of flue linings for their chimneys; of clay shingles for their roofs, and of encaustic tiles for their floors and mantels. Indeed, all present signs point to clay—that most widely distributed and cheapest resource known on earth—as the leading factor in the future structures built by man.

Nor has the increased demand for clay products been confined to those used for building purposes. The use of vitrified products, such as sewer pipe and paving brick, and refractory clay wares such as fire brick and furnace linings, has also been constantly growing. To supply these increased demands new industries have sprung up in many portions of Indiana, and new discoveries have been made concerning the practical uses of many deposits of clay before considered worthless.

### —Definition of Clay.—

It is difficult to give an accurate definition of the term "clay," as commonly used. In general, the name is applied to any soft, earthy substance which, when wet, can be readily fashioned into any desired shape, which shape it will remain while being dried or burned. All clays are, however, not soft. Many of the best clay deposits of the State are hard, rock-like substances, which must be blasted and ground into powder, before being used. Such clays are either shales or fire-clays. The shales are only clays which, many centuries ago, were deposited in deep water. By pressure they have since become consolidated and separated into rather thin layers or laminae. A shale is therefore only a hardened, laminated clay. The fire clays are the under-clays of the coal veins. At one time they formed the soil from which sprung the luxuriant plant growth which was afterwards changed into coal. Those plants removed from that soil many of the elements now found in shales and clays, and as a result articles made from fire-clays are more refractory, i. e., will withstand far greater heat without melting, than will those made from shales or ordinary soft clays.

### —Varieties of Clays.—

When the clay remains in the place where it has been formed it is called a residual clay. When it has been carried by water, ice or other agency to a new location and redeposited in water it is called a sedimentary clay. Ninety per cent. of the clays of Indiana belong to the latter group. Among the sedimentary clays are the shales, above mentioned, which were deposited in deep water, and the fire-clays, deposited in the more shallow

lagoons and swamps in which the cloal plants grew. In the area considered in the present paper, all the clays are sedimentary and most of them are soft clays, belonging to one of three subdivisions: namely, drift clays, or "hard pans;" alluvial clay, and silty or marly clays.

### —Drift Clays or Hard Pans.—

The drift clays or hard pans are by far the more common clays in northwestern Indiana. They form a very large percentage of the unstratified morainic material or till which was dropped where it now lies by the melting of one of more of the great ice sheets or glaciers which many centuries ago invaded Indiana. Transported and deposited as they were, these drift clays are, in general, too impure for any use but the making of ordinary brick and drain tile, and oftentimes they contain too much lime even for this purpose, numerous analyses showing the presence of as high as 40 per cent. of calcareous material. This is due to the grinding up and mixing with the clays much of the surface limestones over which the glacier passed, as the erosion of that epoch not only removed and



W. S. BLATCHLEY, State Geologist, Indianapolis.

commingled the previously formed residual deposits, but planed away the country over a vast area to a greater depth than had been reached by any previous decay. These eroded limestones and the clays with which they were mixed were many of them ground into impalpable powder and deposited before a subsequent decay could take place, so that, as has been well said, "the drift clays are, many of them, rock flour, and not as are the residual clays, the products of rock rot."

### —Alluvial Clays.—

Along the lowlands and second bottoms of the larger streams of northwestern Indiana are found, at intervals, very large deposits of alluvial clays. These are sedimentary clays of the present age. They owe their origin either to the deposition of fine particles of clay on the eddies of the streams, or to the slow accumulation of the clayey sediment during the annual overflows of the areas which they now occupy. In some places they are 30 to 90 feet in thickness and remarkably free from pebbles or coarse impurities of any kind. They are usually very plastic owing to the presence of salts of lime and iron

\*Excerpts from the 22nd Report of the Department of Geology and Natural Resources of Indiana.



oxides which are intimately diffused through them.

—Silty or Marly Clays.—

Silty or marly clays resemble very closely alluvial clays. They differ in that they were deposited in bays, lakes or harbors, by still instead of by flowing water. Much "rock flour" containing a large percentage of kaolin was produced by the passing of the glaciers over beds of shale. This was held in suspension by the glacial streams and finally deposited in the bays and lakes of that epoch. These marly clays are, in general, composed of finer grains than are the alluvial clays. They contain a greater percentage of finely disseminated lime and magnesium carbonates, and for that reason products burned from them are usually cream colored or whitish.

—Infusibility.—

An important property of clay is infusibility or refractoriness. Kaolin and the best grades of fire clay cannot be melted in the highest heat produced by man. This property is very valuable in that it enables clay to be formed into many products used in the structure of fire proof buildings, and in furnaces for the reduction of ores. Most sedimentary clays contain lime, potash, iron and other impurities which weaken the property of infusibility, and cause them to melt or fuse at a comparatively low temperature. Such impurities are called "fluxes." Good grades of fire-clays cannot contain more than three to four per cent. of these fluxes. All sedimentary clays contain a much higher per cent. and for this reason fire bricks, furnace linings, crucibles, retorts, etc., cannot be made from them. Great care must be taken in the burning of wares from such clays, in order to prevent the heat from rising to or above that point where fusion takes place.

—Insolubility.—

Another property of clay is insolubility. The better grades of clay are not affected by any acid or other chemical. On impure clays, however, especially those containing much lime, carbonate of iron or allied chemical, muriatic or sulphuric acid will cause an effervescence or bubbling, and the clay will be in part destroyed. This property of insolubility possessed by the raw clay is not lost in the burning and the finished clay produce can be brought in contact with acids or chemicals without being impaired.

—Induration.—

The last property of clay to be here mentioned is that of induration. By this is meant the power which it possesses of hardening when subjected to heat. The importance of this property can scarcely be over-estimated. Without it an article fashioned from clay would be only so much stiff mud which on exposure to rain or frost would soon crumble to dust on account of its porosity and attraction for moisture. Almost any clay which possesses plasticity enough to be molded into shape can be baked and thereby made to become hard, solid, and stone-like in appearance.

—Impurities of Clay.—

The uses to which any clay can be put are determined very largely by the impurities which it contains. Anything other than the clay-base or kaolin may be considered an impurity. The impurities most commonly found in clays are silica or sand, compounds of iron, lime magnesia, potash, soda, and sometimes organic matter.

—Sand.—

Of these the most common is silica or sand in a free or uncombined state. It is found in all clays, and though classed as an impurity, it is in most instances a necessary constituent, since its presence prevents that warping, shrinking and cracking while drying which is sure to take place in the made-up ware when too great a percentage of pure kaolin is present. Clays which are tough and exceedingly plastic are termed "fat clays," and to them sand is often added artificially to lessen the plasticity and render their products more easily dried.

Uncombined silica in moderate quantities is thus beneficial, since it preserves the form at high temperatures. When in excess it destroys cohesion and renders the ware brittle and weak.

Next to sand, compounds of iron are the most common and the most important impurities of clays. The two oxides, ferrous and ferric, the carbonate, and the sulphide are the forms of iron compounds usually occurring, though others may be present.

—Compounds of Iron.—

The oxides of iron have much to do with the colors of clays, both in the raw and burned state. Ferrous oxide—the more common of the two—is found in all drift and alluvial clays, especially those of a bluish or greenish-blue color. When such clays are burned the ferrous oxide is changed to a ferric oxide, which is brownish red, and the wares become the same color.

Besides imparting a color to clay products, the oxides of iron act as fluxes. Especially is this true where from 5 to 15 per cent of these oxides are present, as in many of the shales and drift clays. Such clays fuse at much lower temperature than others which are similar in every respect except in the percentage of iron oxides. The carbonate, sulphide and sulphate of iron when present, also act as fluxes and are liable to produce a distortion of the brick or other product.

—Lime and Magnesia.—

Among the sedimentary surface clays, especially those treated in the present paper, lime and magnesia are always present. If in fine particles, thoroughly disseminated through the clay, they only act as fluxes and so limit the use of the clay to the making of certain products. Lime, however, more commonly occurs in the drift clays or till, in the form of small grains or pebbles of the carbonate. Unless these can be removed or ground to powder by a crusher, the clays containing them are practically worthless. If burned with the clay each lime pebble loses carbon dioxide and is changed from a carbonate to an oxide or quick-lime. This has great attraction for water, and when exposed each pebble absorbs moisture, swells and bursts off a piece of the ware, causing a defect or shallow pit in its surface.

When lime and magnesia are present in quantity in a finely divided state they combine with the oxides of iron and with some of the sand to form a light-colored double silicate of iron and lime. For this reason many of the alluvial and marly clays in northwestern Indiana—especially those near Hobart, Michigan City and South Bend—although rich in iron oxide, produce whitish or cream colored instead of red products.

—Potash and Soda.—

Potash and soda are two of the most powerful fluxes found in clays. They melt at a lower temperature and unite more readily with the clay-base than do iron, lime or magnesia. Their amount is not large, being, on an average, but 2 to 4 per cent., but in fusing power this is equal to more than double that percentage of the fluxes above mentioned. If vitrified products, such as paving brick and sewer pipe are desired, a total of from 10 to 14 per cent. of all the fluxes named are necessary in the clay. When the ware is raised to a temperature sufficient to melt the potash, iron, lime, etc., these fluxes fuse with the silica and give to the ware that dense, tough, non-porous condition characteristic of all so-called "vitrified" products.

(To be continued.)

## RESULTS OF OVERWORK.

I have learned from observation that three things happen to a man who works steadily without relaxation. In the first place, he becomes nervous, irritable, and hard to get along with. In the second place, the grade of his work falls off, his services are worth less, and he is liable to err in his judgment. In the third place, he dies suddenly. It is an incontrovertible law of nature.—Depew.



Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 4.

Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

JOSEPH STUBBS.

A PROMINENT and successful potter at Dale Hall, Burslem from about 1790 to 1829, was Joseph Stubbs. Little is known of his personal history or of his career as a potter, save that he manufactured quite extensively for the United States market. Among other things he produced a series of dark blue designs of American subjects, usually on plates, platters, vegetable dishes, and probably other pieces belonging to table services. The border design of this series is a handsome combination of scrolls and flowers broken into sections by eagles with half-spread wings arranged at equal distances apart—three eagles on plates and four on platters. Many of his pieces were not marked with his name, which, when used, was simply the word Stubbs, impressed, but all china bearing this border is known to have been made by him. Mr. Stubbs died in 1836, having retired from business a few years before that date.

LIST OF AMERICAN CERAMIC DESIGNS PRODUCED BY JOSEPH STUBBS.

—Designs in Dark Blue. Border, Flowers, Scrolls and Eagles.—

Boston, Nahant Hotel near.  
Boston, State House.  
Hoboken in New Jersey.  
Mendenhall Ferry (Schuylkill River above Philadelphia).  
New York, Church in the City of (Dr. Mason's).  
New York, City Hall.  
Philadelphia, Bank of the United States (First Bank, built

THOMAS, JOHN AND JOSHUA MAYER.

The Dale Hall Works, Burslem, were taken by Thomas, John and Joshua Mayer in 1829, from Joseph Stubbs. No American printed designs appear to have been made by this firm. T.



BANK OF THE UNITED STATES. (Old print from which the Stubbs design was copied.)

Mayer (supposed to be the Thomas above mentioned), however, seems to have been in business alone at one period, as the mark which occurs on some of the American designs is simply T. Mayer, Stoke. He produced a set of dark blue prints showing the Arms or Seals of some of the United States. It is probable that all of the thirteen original States were represented in this series, though some of them have not as yet come to light. The border was a handsome device composed

of trumpet flowers, with three or four stars or wheel-shaped ornaments at equidistant points around the edge. A list of the designs of this set which are known to collectors follows.

LIST OF AMERICAN CERAMIC DESIGNS PRODUCED BY T. MAYER.

—Designs in Dark Blue. Border, Sprays of Trumpet Flowers and Marginal Stars.—

Arms of Connecticut.  
Arms of Delaware.  
Arms of Maryland.  
Arms of Massachusetts.  
Arms of New Jersey.  
Arms of New York.  
Arms of North Carolina.  
Arms of Pennsylvania.  
Arms of Rhode Island.  
Arms of South Carolina.

R. S. W.

Perhaps the most artistic and the best drawn designs of American subjects were produced by a manufacturer or firm, designed on the ware by the letters R. S. W. and sometimes by R. S. & W. Several explanations of these initials have been given by ceramic students. Some believe that they stood for the firm of Ridgway, Son & Wear, but the most probable sup-

position is that they were the initials of Ralph Stevenson and Williams, of Cobridge. A dark blue plate with medallion portraits of Washington and Lafayette has recently been discovered which bears in full the firm name of R. Stevenson &



MENDENHALL FERRY

By Joseph Stubbs. (Courtesy of the New England Magazine.)

1795), from engraving by Wm. Birch & Son; 1799.

Philadelphia, Fairmont Nr.  
Philadelphia, Fairmont Nr. (same, with sheep; on platters).  
Philadelphia, Woodlands Near.  
Upper Ferry Bridge over the River Schuylkill (Phila.).

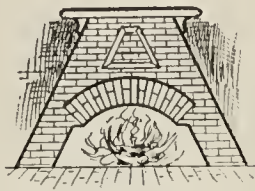


Williams. While this particular piece possesses a different border from that which characterizes the series issued by R. S. W., there are certain peculiarities in the engraved work which

these lists are requested to communicate with the writer, Edwin A. Barber, West Chester, Pa., calling his attention to the fact.

Written for the CLAY-WORKER.

#### A BRICK FACTORY IN A WOODEN TOWN. No. 4.



AFTER SUMMING UP the loss on our first kiln of brick, we pulled ourselves together in an attempt to find out what had struck us. We solaced ourselves with the reflection that many great undertakings had been failures at first. We came to the conclusion that new processes of brickmaking required new thought, and that a change of clay might necessitate a change of management from the bank to the finished product. Our manager, who was of a very sanguine temperament, made light of such a small loss as the failure of one kiln and promised great results in the next. He had a very plausible explanation for every phase of our troubles, and offered prompt solutions for every problem presented. He quoted his "experience" at making brick at the old yard, how he had met many difficulties and settled them all to his entire satisfaction. He began nearly every sentence with the words, "My experience has been," or "During my experience of ten years," and all suggestions on our part were eclipsed by his "experience of ten years." Another kiln, and still a third one was burned with pretty much the same average of results—always entailing a loss of from one to two dollars per thousand of brick burned. We had been doing a great deal of hard thinking all this time, while we were making the greater part of our entries within the debit column of our ledger. We concluded that the end-cut die was not suitable to our clay—because of so much lamination in the brick—so we ordered a side-cut outfit, and had the satisfaction of finding a decided improvement in the quality of our product. The side-cut brick dried better in our sheds with less checks and breakages. Then in burning, too, there was noticed some improvement in the bricks. They were more easily water-smoked, and



WOODLANDS NEAR PHILADELPHIA. By Stubbs.

seem to indicate a common origin. We seem justified, therefore, in attributing to R. Stevenson & Williams the designs which bear the mark R. S. W. These latter possess an artistic border pattern of oak leaves and acorns, especially pleasing because of its simplicity and truthfulness to nature.

#### LIST OF AMERICAN CERAMIC DESIGNS PRODUCED BY R. S. W. (OR R. S. & W.)

—Designs in Dark Blue. Border, Oak Leaves and Acorns.—  
Boston, Nahant Hotel near  
Columbia College.  
Harvard College.  
New York, American Museum (Scudders).  
New York, City Hotel.  
New York, Park Theatre.  
Philadelphia, Water Works.  
Washington, Capitol.

R. STEVENSON & WILLIAMS.

—Design in Dark Blue. Border, Vase of Flowers and Scroll Work.—

Washington and Lafayette (portrait busts).

RALPH STEVENSON.

The Ralph Stevenson, above mentioned as being a partner with Mr. Williams, was evidently engaged in potting on his own account, either before or after such connection. A number of designs in dark blue, and some in other colors, marked R. S. have been attributed to him.

#### LIST OF AMERICAN CERAMIC DESIGNS PRODUCED BY R. S. (RALPH STEVENSON.)

—Designs in Dark Blue. Border, Vine Leaves.—

Boston, Hospital (canal in foreground).  
Boston, Hospital (without canal).  
New York, Esplanade and Castle Garden.  
Boston, Almshouse.  
Boston, Lawrence Mansion (so-called).

R. S. (RALPH STEVENSON).

—Designs in Red, Brown, Black, Purple, etc. Lace Border.—

Erie Canal at Buffalo.  
New Orleans (View of city).

Note—Those possessing designs inadvertently omitted from



ARMS OF PENNSYLVANIA, by T. Mayer. (From the Ceramic Monthly.)

did not break so badly as did the end-cut. This was encouraging to us, but still we nauded great quantities of bats from the kilns and dumped them into the mud holes—while at least one-third of our product was soft brick, much of which had to be set in the next kiln to be burned a second time. The percent. of waste was so great that it was impossible to make any profit, no matter how good our trade, or at what price we might sell our brick. We were to a considerable extent operat-



ing upon borrowed capital, but it was waste and not interest that was running our business. Money in our community cost us eight per cent., but that was a small item compared to the other leaks that flowed in great streams from our exchequer. Our manager claimed that the cause of so much breakage in drying and burning was the presence of a certain amount of black clay in our bank, which for want of a better name we called "Gumbo." It was of a very fine grain, somewhat "jointy," and when dry was as hard as a rock. So for a long time we avoided "Gumbo," but that did not improve the matter at all. We added salt to the clay, increased the amount of sand, decreased the amount of sand, took out some of the pugging knives put in more pugging knives—in fact, tried everything but the right thing—and always failed to make brick at a profit. This continued for a year and a half, and our bank account was getting into a deplorable condition. We were beginning to think of "issuing more bonds," providing we had sufficient credit to do so, on the grounds of a "war necessity." When one morning our plant was visited by a gray-haired old gentleman, who wore nothing that morning that I happened to notice but a troubled expression and a certain light in his eye that boded trouble for some one. He was our financial backer. He did not know how to make brick,

had seen enough mistakes made to know what not to do, and thought these mistakes would enable us to learn in course of time what methods would best suit our clay. We went over



ARMS OF SOUTH CAROLINA, by T. Mayer. (Courtesy of Godey's Magazine.)

but he did know how to make money, and knew that we were failing to make that very useful commodity. That troubled expression on his brow meant that he was in grave doubt regarding his security, and that look in his eye meant that there was going to a change of administration. He had a long talk with the manager, and an arrangement was made to turn the plant over to our creditor for the money we owed him, and then he would be a heavy loser, with an elephant on his hands in the bargain. I wish right here to say a word in behalf of our retired manager. He was a young man far above the average for intelligence, industry and push, but had not that faculty of adaptation without which no one can succeed. He had made good brick at the old yard, but he could never unlearn what he had learned there, and his knowledge would not fit the new condition of affairs. I really believe that his ten years' experience was a hindrance to him in the new factory, and that it took him longer to unlearn the old way than it would a novice to learn the new. Our new manager came to me and asked if I thought I could make brick. I told him I



ARMS OF RHODE ISLAND, by T. Mayer.

the situation together and decided upon many changes. We believed the clay bank was all right. For we reasoned if one can make good half bricks, why could he not make good whole ones? If our market had called for a brick 4x4x2½ inches we could have filled some large orders with first-class material. And if fifty per cent. of our brick were really excellent, why could not one make almost 100 per cent. good brick by careful management? We believed it could be done, and set about systematically to accomplish that result. L. C. M.

#### BINDING EFFECT OF RETAINING STATEMENT OF ACCOUNT.

The law is that where a party indebted on an account receives a statement thereof, and retains it beyond such time as is reasonable under the circumstances, without objection, he is considered to have acquiesced in its correctness. The account is then called an "account stated." And not only does the Supreme Court of Minnesota hold, in *I. L. Elwood Mfg. Co. against Betcher*, April 27, 1898, 75 Northwestern Reporter, 113, that keeping an account rendered at the time of a sale



AMERICAN MUSEUM, N. Y. CITY HOTEL, N. Y.  
By R. S. W.

without questioning its correctness for nearly one year, made it an account stated, but that an offer of the purchaser to settle by giving his note for the balance alleged to be due amounted to an admission that the account as presented was correct.



Written for the CLAY-WORKER.

## BRICK AND ASPHALT PAVEMENTS.

**A Good Combination—Brick Used to Improve Asphalt Pavements—The more Brick the Better and more Durable the Pavement.**



THE PRINCIPAL business thoroughfare of Indianapolis, Washington street, has recently been repaved. Several years ago it was covered with what was then known as asphalt pavement. Soon after it was placed in position it began to show signs of failure. Then the public was informed that it was not asphalt but some kind of a tar or pitch composition pavement, and that if the genuine, simon-pure asphalt pavement were put on other streets all would be well. A large number of asphalt streets since have been put down and very few of them are satisfactory. In some instances where there are no street-car tracks, where the gutter drainage is good and the travel relatively light, these streets make a good appearance. An attache of one of the asphalt companies told me recently that the great unevenness of the surface of many of the streets recently put down was the mistake of getting too much petroleum in the composition, "but now that mistake will be remedied," he said, "and in the future all will be right." This is the dominant song of asphalt agents, and it is sung by masters. It wins. As we stated, Washington street has been repaved. With asphalt? may be asked. Yes and no. Asphalt has been used where the strain is the lightest, where it is least liable to fail, and brick has been used where the strain is the heaviest and where asphalt has hitherto shown its greatest deterioration. It is intended that brick should bear the brunt of the fight. Brick is the paw that pulls the chestnuts out of the fire for the asphalt contingent. We grant that these gentlemen are wise.

The first failures of asphalt are next to the gutters and street-car tracks. Now, how is the Washington street pavement constructed? Four feet from the curb is brick. There is a stone border on each side of the street-car track set flush with the street. Between this curb and the rail and between all tracks is fifteen feet eight inches of brick. Brick surrounds all curves, is in the triangles formed by the curves of the tracks, and in any place where asphalt has hitherto had a hard time. Still the world will say that Washington street has an asphalt pavement.

Will brick do credit to itself? Where they are well laid, yes. It so happens that they are well laid where the strain is the heaviest; that is, next to the gutter. They are not so well laid between the tracks. They rest on a sand bed. They were laid as evenly as possible on such a foundation, but even now show unevenness. Unevenness and lack of a rigid foundation are particularly fatal to any form of block pavement, either brick or wood. Any pavement which does not rest on a foundation that is rigid and smooth is discredited thereby. Now the gutter pavement we affirm will stand; it will prove satisfactory. The brick adjacent to the tracks will do better than asphalt has done or will do in that situation. We shall see what we shall see. The brick between the track are Canton standard paving brick. They are laid upon a broken stone and sand foundation, and as such the work is well done. The brick pavement between the tracks is put down by the Street Railway Company of this city, though under the direction of the City Engineer's office. The Street Railway dictated the general character of the material which they would use. They refuse to put in the cement foundation which would have been preferred by the Engineer's office of this city.

The gutter pavement is the Hayden block, and it is laid right. It is placed directly on a concrete bed. The recesses in the bottom of the block are filled in with concrete, and the

bricks are laid in cement mortar. Between the street railway tracks and the gutters on each side thereof is twenty-eight feet of asphalt. If the bricks between the tracks had been laid in exactly the same way as the gutter pavement the result would have been an ideal pavement for this part of the street.

Where asphalt has been used for paving next to the tracks and between them, the failures have been conspicuous. In



LAYING BRICK BETWEEN STREET CAR TRACKS.

some places it presses above the track; in other sections there are depressions. It becomes loose and cracks; in truth, wherever asphalt is used next to the tracks, constant repairs, unsightly conditions and a dangerous condition for wheels always exist.

In the gutters the moisture, the uric acid and other materials always work destruction upon asphalt. Now again, asphalt companies object to having pavement sprinkled. They



say throwing cold water on a hot pavement is ruinous. Asphalt is a very delicate material. We understand that the manufacturers object to putting it in alleys where brick serves such an admirable purpose. Thus it is that asphalt is not suitable for use between street railway tracks; evidently it should not be used in gutters; it is injured by sprinkling, and it is not suited for alleys because there must be a gutter in the center. Yet with the able advocates back of it, with the push of capable agents, asphalt is very largely used despite every inherent and acknowledged weakness.

We give pictures of Washington street before it was taken up. Nothing that we can present gives an adequate idea of the character of that pavement. For many years it had been in this condition. The beginning of its failure dated from the

bad pitch pavements were a counterfeit. It was a composition gotten up to satisfy the demands and to take the place of genuine asphalt pavement. The material which we call asphalt contains from 9 to 13 per cent. of Trinidad pitch, which is not asphalt at all. The composition which we have to call asphalt because it is here known as such contains this small base of Trinidad pitch as its composition. It was conceived as a counterfeit and remains so to-day. Whatever its merit it would stand quite as well under its proper name of Trinidad pitch.

The writer has long had his idea as to how a brick pavement should be laid, and he has never seen anything to disturb that opinion. To state in short form the process, I will say that there should first be an 8-inch concrete bed made of German



BRICK AND ASPHALT—1. The Old Asphalt, badly worn. 2. Tearing up the old Asphalt. 3. A Strip of Finished Pavement. 4. Laying the Brick.

time it was first put into use. We have many relatively new asphalt pavements in the city which are rolling in surface, depressed in spots, and to ride over them is decidedly uncomfortable. There is no country road around Indianapolis that the writer is familiar with which presents as bad wheeling as streets like Ohio and Sixteenth streets. Such rolling surfaces, which jolt and jar one furiously as he rides over them, are not the result of wear, but appear to come about by some sort of kneading process. The material is thin and thick by turns. Of course, these pavements wear, but that is not all.

The writer always feels like apologizing to the genuine asphalt when he speaks of Trinidad pitch pavements as asphalt. Col. Greene acknowledged a good many years ago that Trini-

Portland cement, the same as is used for the best asphalt and block pavements. It should be made perfectly smooth and true on the top so that when a small quantity of cement mortar is placed on the top it will form an exact surface in which the brick may be laid and bedded. Each course of brick should then be laid to a templet on the top, well bedded in from below. The brick should be laid about  $\frac{3}{8}$  of inch apart and a Portland cement slush should be brushed in between the brick with wire brushes after the lower bed of mortar has set. It should be brushed in until it flushes on top. It is absolutely necessary that the bricks be exactly level on their upper surface, that there be positive means of securing this result. Nothing short of a templet should be relied on, and it is ab-



solutely necessary that the foundation should be positive, smooth, solid and unyielding. A foundation of this kind will do credit to a brick pavement, and it is the only way that a first-class pavement of brick for a street with heavy wear should be laid. Consequently, it is merely a question of degree no matter what street it is used upon. With the right kind of brick laid on a foundation of this kind and laid in this way, I believe that the most permanent street, the one costing least to maintain, may be provided. "But," says some one, "this is expensive." Of course it is expensive as to its first cost. So is any first-class street, but it is not nearly so expensive in the long run as cheaper methods of laying pavements. It is cheap foundations which have in many sections discredited the use of brick. Brickmakers have, I believe, been largely responsible for this. They wished to have something cheap which they could use to cut under asphalt and other expensive pavements. Hence, they have recommended a cheap foundation. This has caused great loss to the brick-paving interest and has discredited one of the best paving materials known. In this opinion with respect to brick pavement foundations, I do not wish to commit the Clay-Worker, but am anxious to take any criticism which may come from it to my own account. It is a long-cherished opinion, and one expressed in less confident and vigorous terms many years ago. I stand firmer on this foundation than ever before.

LOUIS H. GIBSON.

#### BRICK VS. ASPHALT IN SMALL CITIES.\*



THE QUESTION "is brick better than asphalt for small cities" raises many interesting points, which the engineer has to take into consideration in solving this problem. The first question that comes up is "what is a small city?" In Indiana, any town with 2,000 or more inhabitants is a city if incorporated as such. The second

question is "Which of the two, brick or asphalt, is better for paving the streets of small cities, and why?" If I should be able to demonstrate to you clearly that brick is superior for paving small cities, would it not naturally follow that brick would be superior for the streets of large cities? If not, why not? There are many other materials which might be legitimately considered, which might prove equal to either brick or asphalt were the local advantages taken into consideration; that is, the native materials at hand which might be utilized. The grades of the streets, the cost of the first investment, interest on said investment, and the cost of maintenance being very important items. But as all these questions enter into, or should, at least, the problem which each small city has to solve, in order to solve correctly her street improvement question, I will not treat of them here. What this society wants to know, and what I have been asked to enlighten you upon is, which is the better, brick or asphalt for small cities. I do not imagine that I can settle this important question definitely, but hope to be able to give you some light on the subject, and may be able to put up some figures on the two materials, which correctly handled will not lie, but may leave plenty of room for argument. In considering brick we mean, of course, the vitrified paving brick or block. Brick presents many good qualities as a paving material, being impervious to moisture and many other things, among which are included the "X rays." This may account for the many shaded transactions, not capable of penetration, concerning street deals, in which these two materials have come into competition. Brick are also about as indestructible as iron, and not being affected by heat or cold, will not disintegrate. Brick streets are claimed not

to be as dusty as asphalt, which is a great objection to any street, and if properly laid, should present a smooth and continuous surface, and that is the essential quality in any street. It is practically as smooth as asphalt if properly laid, and will retain a smooth surface under very heavy traffic. It is easily repaired, when necessary to take it up for the purpose of making water, gas or sewer taps, or for other purposes, and can be repaired by the ordinary workman in almost any season of the year. With asphalt it requires special skilled labor and the most favorable seasons, which necessarily means a very high price, exceeding that of brick, in most cases of repairs, 300 to 400 per cent. The best pavement for small cities is the one costing the least in the first place, the least in maintenance, and the one most easily repaired, that will meet the requirements of the small city. An asphalt street presents a nice appearance, and when properly laid is very fine. We could hardly wish for anything better. It is equally true with brick. Of course, I only intend to treat of the best grade of brick and asphalt streets, those having concrete foundations. Brick for paving purposes have passed the experimental stages, and we find in the market to-day a material that cannot be excelled by any other product for street paving. It has certainly come to stay, and the good results to be attained from its use will rest with the practical engineer. I do not wish you



A Six-year-old Brick Pavement, Richmond, Ind.

to infer from the above that all the bad results in brick pavements have been the fault of the engineer. Oh, no, far from it. But much of it has been, and can be traced, to this threshold. There are many cases where the engineer has not been vested with the authority he should have had, and many cases where he has had the authority, but failed to exercise it, either from want of knowledge and judgment, or because there were other influences which made him shirk his duty. We have in Richmond, Ind., at the intersection of six streets, a piece of brick pavement, laid on concrete foundation of 6 inches, with pitch filler, put down in 1891. It is practically in as good condition to-day as when laid. I found on December 23, 1897, by actual count that there were passing over this intersection 175 vehicles of all kinds, making an average of 184 tons per hour. Of course, this was a busy season, but I submit the following, which is an average of two days, Dec. 28 and 29, 1897, of 11 hours each, which I consider below a fair average day's traffic, on account of the weather, and the time being just after Christmas. I give the traffic for each hour, from 7 a. m. to 6 p. m., and also the kind of vehicles. I estimated the weight of these vehicles and verified them by the weigh-master at the scales

\*Excerpts from a paper read before the Indiana Engineering Society by H. L. Weber, City Engineer, Richmond, Ind.



of Irwin, Reed & Co. The estimates are as follows:

|                                                              |            |
|--------------------------------------------------------------|------------|
| Single pleasure vehicles, including horse and occupants..... | 1,300 lbs. |
| Double vehicle.....                                          | 2,500 lbs. |
| Trucks, etc., single, empty.....                             | 2,200 lbs. |
| Trucks, etc., single, loaded.....                            | 4,000 lbs. |
| Trucks, etc., double, empty.....                             | 3,500 lbs. |
| Trucks, etc., double, loaded.....                            | 6,500 lbs. |

You will notice that all figures are for an eleven-hour day, and do not include bicycles, pedestrians, and vehicles which pass during the night, from 6 p. m. to 7 a. m. All this passing is thrown in for good measure.

|                    |      |                      |      |
|--------------------|------|----------------------|------|
| Tenth year.....    | 1.63 | Thirteenth year..... | 1.94 |
| Eleventh year..... | 1.73 | Fourteenth year..... | 2.05 |
| Twelfth year.....  | 1.83 |                      |      |

The average cost of the best brick or brick pavement in twenty-two cities of the United States in 1897, laid in the street, including the best pitch or Portland cement filler was ninety-five cents per square yard. In comparing this amount with the above table of savings, it will be readily seen that on an average life for brick payment of a little less than thirteen years, they can be built and perpetually maintained for the first cost of asphalt pavement. I find that the cost to resurface

asphalt pavements in seven cities in the United States in 1897 was \$1.30 per square yard. In many cities they are surfacing old granite and brick streets with asphalt. This is done by thoroughly washing and sweeping the pavement, then heating it with surface heaters. While warm the surface is painted with asphalt paint. On this is laid the regular paving mixture of asphalt. I find that this has cost on an average \$1.30 per square yard, which seems to me to be a very high price, when you consider it has cost only ninety-five cents to relay brick pavement. I have also selected from the twenty-two cities, eight cities where brick and asphalt have come into the sharpest competition which do not show such a great difference in the first cost of the two.

TABLE OF TRAFFIC OVER  
BRICK STREET INTERSECTION AT N.E. & 8<sup>TH</sup> ST. RICHMOND, IND.  
December 28 & 29, 1897

| Time of day,<br>Kind of Vehicle | 7 to 8<br>A.M. | 8 to 9<br>A.M. | 9 to 10<br>A.M. | 10 to 11<br>A.M. | 11 to 12<br>A.M. | 12 to 1<br>P.M. | 1 to 2<br>P.M. | 2 to 3<br>P.M. | 3 to 4<br>P.M. | 4 to 5<br>P.M. | 5 to 6<br>P.M. | WEIGHT OF<br>TRAFFIC IN<br>POUNDS | TOTAL NUM.<br>EACH KIND<br>OF VEHICLES |
|---------------------------------|----------------|----------------|-----------------|------------------|------------------|-----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------------|----------------------------------------|
| Pleasure Sgl.                   | 25             | 35             | 28              | 45               | 51               | 27              | 47             | 53             | 62             | 75             | 34             | 526,600                           | 482                                    |
| Pleasure Dbl.                   | 2              | 3              | 1               | 6                | 2                | 7               | 1              | 2              | 5              | 3              | 2              | 85,000                            | 34                                     |
| Truck, Sgl. Emp.                | 7              | 16             | 18              | 15               | 9                | 6               | 12             | 17             | 20             | 15             | 6              | 297,000                           | 141                                    |
| " " Load                        | 5              | 9              | 6               | 10               | 3                | 2               | 2              | 9              | 8              | 2              | 0              | 224,000                           | 56                                     |
| Truck Dbl. Emp.                 | 5              | 3              | 5               | 17               | 19               | 7               | 12             | 9              | 13             | 13             | 7              | 360,500                           | 110                                    |
| Truck Dbl. Load                 | 5              | 2              | 6               | 7                | 6                | 3               | 6              | 9              | 8              | 3              | 0              | 330,000                           | 55                                     |
| TOTALS                          | 49             | 68             | 64              | 100              | 90               | 52              | 80             | 99             | 116            | 111            | 49             | 1,823,100                         | 878                                    |

THE TOTAL NUMBER OF TONS = 911.2 IN 11 Hrs

The above photograph of this intersection was taken on Dec. 14th, 1897, six years after the pavement was laid. Over this street passes daily 75 tons of freight to one of the freight houses of the P., C. & St. L. R. R., and has been doing so since it was laid. In these six years there has passed over it 141,000 tons of freight to this one point alone, which practically means that many vehicles to this one place of business. I venture to say that amount does not include ten per cent. of the tonnage passing over this intersection, and that 1,923,000 vehicles would not exceed the traffic passing over this piece of this pavement in this period. On the 28th and 29th days of December, 1897, there passed on an average 878 vehicles each day in eleven hours, which will indicate that at least 320,000 vehicles pass over this intersection annually. It has not cost one cent of repairs in this period, nor does it practically need any at present. Twelve will be a low estimate of its life. If this piece of street has withstood this enormous traffic for six years and has not cost one cent for repairs and does not need any now, it looks reasonable that twenty years is a fair and conservative estimate to put upon the life of a first-class brick street of any small city, where care is taken to compel water and gas companies and sewer contractors when they tear up the street, to replace it in a proper manner. I have gleaned from the pages of the Engineering News that the average cost of asphalt pavement in twenty-two cities in the United States during 1897 was \$2.42 per square yard. I also find that the best brick pavement on concrete foundation in the same twenty-two cities in the United States in 1897 cost \$1.51 per square yard. The difference in cost of the two payments, or the amount saved in the first cost is ninety-one cents per square yard. This amount being placed at 6 per cent. interest annually on the accumulation plan, to create a guarantee repair fund to maintain the street, we find we have saved and accumulated per square yard of payment at the end of the First year the amount of \$0.96

|                  |      |                   |      |
|------------------|------|-------------------|------|
| Second year..... | 1.02 | Sixth year.....   | 1.29 |
| Third year.....  | 1.08 | Seventh year..... | 1.39 |
| Fourth year..... | 1.15 | Eighth year.....  | 1.45 |
| Fifth year.....  | 1.22 | Ninth year.....   | 1.54 |

The average cost for 1897 in these eight cities has been as follows:

|                              | Brick. | Asphalt. |
|------------------------------|--------|----------|
| Cincinnati.....              | \$1.60 | \$2.40   |
| Detroit (Alcatraz).....      | 1.50   | 1.68     |
| Grand Rapids.....            | 1.50   | 1.65     |
| Lima, Ohio.....              | 1.20   | 1.70     |
| Philadelphia (Trinidad)..... | .....  | 2.05     |
| Philadelphia (Bermudez)..... | .....  | 2.05     |
| Philadelphia (Alcatraz)..... | 1.49   | 1.65     |
| Terre Haute.....             | 1.30   | 2.10     |
| Toledo.....                  | 1.35   | 1.80     |
| Youngstown, O.....           | 1.70   | 2.48     |

The average cost of these selected cities has been for asphalt \$1.96 and for brick \$1.46 per square yard. From the first table of cost of the two materials, we glean that the cost of brick is sixty-three per cent. of that of asphalt—and that the cost to reconstruct brick is 73 per cent. of that to surface asphalt. In all small cities the figures many not show far better results. To solve the problem correctly, which is the better pavement for small cities, we will have to work along the line of its advantages and requirements. Small cities do not present the advantages for asphalt that they do for brick. Why? Because there are not many streets to be improved in small cities. Where asphalt streets are laid there must be a plant erected, the cost of which must be added to the cost of improving the streets, which works like a traffic law "the consumer must pay the tax." The portable railway asphalt plant will help to secure cheaper asphalt streets for small cities, but at present the advantages are decidedly on the side of brick

#### DISCUSSION.

Which is best, sharp edge or bevel-edge brick?

Mr. Dickinson: What is the consensus of opinion on brick? Do you prefer sharp cornered edge or bevel-edge? I prefer the former.

Prof. Sackett: Mr. Weber has the supervision of some of the best brick pavement I ever saw. The photograph shows that those brick which were first sharp-cornered have in six years become round. The brick were of remarkably uniform quality. I think that all brick in the course of time wear to a bevel



edge. Whether or not it is best to have them square and let them wear as they will I can not say; but I believe if it is vitrified brick they should have bevelled edges. The photograph shows very distinctly that the edges have worn off quite uniformly. The pavement is still in good condition. I think the argument on this subject is quite weighty, because of the very careful engineering which underlies the brick pavement. There are some very fine pieces of asphalt in the city of Detroit, and some that are poor. The surface sometimes disintegrates. I think, we get under careful engineering supervision what we pay for, and at the same time Mr. Webber probably referred to cities such as Richmond, or a little smaller, where brick is certainly cheaper and makes a very fine street.

Mr. Dickinson: Of course without a good filler to support the edges of the sharp-cornered brick the bevelled brick would be better; but if we can obtain a filler that is sufficiently strong to support and maintain that sharp edge, of course the sharp edged brick makes a smoother pavement.

Mr. Whitten: This question of bevelled edge is one I have thought a good deal of and I made some tests. A certain firm furnished specimen brick for pavements. The agent representing the firm claimed that the bevel edge brick was the only up-to-date material to use, and informed me that his company would not submit specimens of square edged brick and would not use or furnish them. Well, I had been of the opinion that there was a good deal of assumption in that statement. I undertook to give a test of that brick. There was some fifteen or twenty different makes, but after the agent had gone away the company making the brick thought perhaps it would be well enough to humor my prejudices in favor of square brick, so they sent some square brick manufactured from the same material that the rounded brick were. Having both I put them in the test. After rattling them the agent came in one day and looked through the sacks containing his own sample and those of some ten or fifteen other firms. "Ah," said he, "there is the brick you want, that is the brick that will stand the test." It was the square edge brick of his company. I said, "Yes, that is the brick you don't recommend." The truth of the matter is, that after the first ten minutes in the rattler, the square edge brick showed a less percentage of loss than the rounded.

#### —Shale vs. Fire Clay Pavers.—

Mr. Phillips: I would like to ask what difference is noted, if any, between shale brick and fire clay brick? I believe the fire clay is more brittle and does not make as good a pavement as the other. Now, what effect has a raised letter? The majority of contractors claim that the raised letter is not an advantage, and that the work will be stronger and better without the raised letter than with it.

Mr. Whitten: I used to think the shale superior to the fire clay, but there were some facts shown in my test, that led me to believe that a certain degree of refraction is necessary in a pavement, more than you find in the pure shale. The pure shale is hard, but not tough. If you have enough of that characteristic it gives a better brick, more toughness. My idea of a brick is a tough brick. I believe that word expresses the quality of brick better than anything else.

Mr. Phillips: Is not the fire clay brick apt to be more brittle?

Mr. Whitten: The shale is more brittle. There seems to be certain kinds of clay that have a certain amount of fire clay mixed with them and makes a tough and hard brick.

Mr. Phillips: The fire clay sewer pipe is the poorest kind of pipe, isn't it?

Mr. Whitten: It is less impervious, and fire clay sewer pipe in order to get the strength has to be a good heavy pipe, but I think perhaps pipe are made of a more refractory clay than these brick. There are a number of firms now making brick from a material such that if you want a shale brick it is shale, and if you want a fire clay brick it is a fire clay, just whichever the purchaser wants. It has some qualities of both, and I don't

know but that is the best kind of brick.

Mr. Hammond: You do not naturally get either a pure fire clay or shale, and the material, if it is mixed properly and burned properly, would show that what is known as the shale and fire clay sewer pipe would be practically the same. There is not much difference in the two kinds of pipe. So far as the shale and fire clay brick is concerned, I do not think we get a pure fire clay brick at the present time. I do not think they are manufactured. I know of one manufacturer, who used to make a pure fire clay brick and found it too brittle, and now he is making a brick of a mixture of these materials and it makes a better brick. We practically now, do not get either a pure fire clay brick or pure shale brick wherever they may be made.

#### —Spacing Brick in Pavement.—

Mr. Goss: In regard to raised letters. Somebody conceived the idea of making brick with lugs on one side to act as separators. It seems that they found out when the brick were put too close together it was almost impossible to get the filler in. That idea was patented. In order to get around that patent some of the manufacturers made raised letters on the sides of their brick. The only trouble about the raised letters is that they are not raised enough; there are still a lot of the brick that fit too close together. I think they ought to be separated by some means.

Mr. Phillips: I have heard that the recess letter would be better. There are supporters of both kinds of letters. The point that some contractors make about the raised letter is that it is more difficult to make repairs. It is easier to repair with the plain brick.

Mr. Whitten: If you want to get the brick separated why not put in a little atmosphere? It seems to me the closer we get the brick the better.

Mr. Goss: It is a pretty hard matter to get a brick layer in going across the street to pay any attention to how he lays the brick, but if you have some way to fix it so that he cannot get them too close together, he will not do so. I do not believe they ought to be laid close.

Mr. Smith: I have seen specifications that call for wooden strip one-eighth inch to one-fourth inch in thickness to be laid in and the brick placed close against them. That makes place for the binder, but is a great deal of trouble.

Mr. Phillips: One-fourth inch is too much.

Mr. Smith: Last year we had some of the raised letters and some of the recessed letters, and in using the cement filler in both cases, I found that the cement went clear to the bottom of the brick. We have had to take up some of our work on account of gas leaks, and I examined the brick and could not see any difference between the raised letter and the recessed letter as to the cement going down. In order to get those brick out we had to chop them to pieces. We had to use new brick to repair with.

Mr. Whitten: Whenever the cement is heated will it not find the base of the brick even though they may be laid closely?

Mr. Vail: It does not get soft enough at any time, even in the hottest weather, to go down. It merely becomes elastic.

#### WAGES AND PRICES.

In the rise or fall of wages and in the variations of the purchasing power of a dollar, we have a phase of the monetary and industrial problem. In a recent investigation made by the State Bureau of Massachusetts, some valuable information has been secured regarding the ups and downs of wages and prices in that State. The following table gives the weekly wage rate in such industries where the comparisons extend to 1872:

| Average Weekly Wages | 1872.   | 1881.   | 1897.   |
|----------------------|---------|---------|---------|
| Blacksmiths.....     | \$16.44 | \$16.38 | \$16.00 |
| Boots and shoes..... | 12.71   | 11.06   | 11.90   |
| Building trades..... | 15.66   | 11.00   | 15.83   |



|                                |       |       |       |
|--------------------------------|-------|-------|-------|
| Cabinet making.....            | 14.21 | 11.51 | 13.02 |
| Carpetings.....                | 4.89  | 5.94  | 8.26  |
| Carriages.....                 | 17.31 | 13.43 | 13.51 |
| Clothing.....                  | 9.71  | 10.90 | 9.01  |
| Machinery.....                 | 13.84 | 16.48 | 10.80 |
| Metals and metallie goods..... | 6.06  | 13.42 | 9.51  |
| Paper.....                     | 7.37  | 9.47  | 9.31  |

In commenting on this report, the Springfield (Mass.) Republican editorially says:

"In six of the nine industries specified average wages are lower to-day than in 1872. Agricultural wages per month with board was \$23 in 1872, and \$18.50 in 1897. Cotton mill wages are given as \$7.59 weekly average in 1881, and \$7.71 in 1897, the latter returns having been obtained prior to the general ten per cent. reduction of last winter. Compared with 1881 wages are more generally higher, and this is true not only of the in-



Mr. T. B. McAvoy's Country Home.

dustries mentioned above, but of others, such as the woolen manufacturers, straw goods, stone cutting, rubber goods, printing and glass making. In hosiery and leather wages are lower than 1881. Wages as a rule were lower in 1860 than in 1872."

These figures of course are more or less effected or modified by local or special circumstances, and are not conclusive as to conditions elsewhere. They are, however, in a general way indicative of the trend of wages in nearly all industries. The tendency in the majority of trades has been downwards since 1872, with the added fact that more is being done for the same money now than then. Work is done under higher pressure, and the turn over of products is much more rapid and larger. This fact accepted, the vital point of the question lies in the increase and decrease of the purchasing power of the wage paid to labor.

In a tabulation of twenty-two articles of food, clothing and that of rentage or housing, it is shown that the dollar of 1897 will buy more in ten cases and less in twelve than in 1860, but as compared with the prices of 1872, one dollar in 1897 will buy less in only one case. In some manufactured articles, such as boots, flannels, shirting, cloth, etc., the purchasing power of the dollar has largely increased, in some cases, to twice its value since 1872. The conclusion reached by a fair comparison of wages and prices, is, that as a whole, the toilers of the country are moving onwards to a higher style of living, have more comforts at less cost than those of a few decades ago, are better clad and housed, and in comparison with the industrial classes of some European countries the American mechanic and laborer if not in clover is certainly not in straw. This is not saying that in some lines of industry wages are miserably inadequate, or the pressure of toil abnormally severe, or that

wages and prices are not manipulated by unscrupulous parties for personal or corporate aggrandizement, or the problem of the unemployed is less grave or menacing than heretofore. For all of this, however, the bulk of the people are moving in line to better conditions.—Age of Steel.

Written for the CLAY-WORKER.

#### THE McAVOY VITRIFIED BRICK CO.



UCH IS THE title under the charter of the above plant at picturesque Perkiomen Junction, in the splendid rolling lands of Chester County, that has risen Phoenix-like from the ashes of the disastrous fire which occurred there nearly eighteen months ago.

Stalwart, energetic Frank McAvoy possesses to-day, working premises that can't be beaten in all the Keystone State. It's a trim looking and almost fire proof plant, and a good paying one, to boot, therefore salute him, ye clay workers, he's a good fellow, and

his old hat still fits him.

Mounting the clay bank after walking down the railroad track and ties, I was hailed by Boss Bushong and about fifteen inches of heavy oleo-margarine-like mud. Ignoring his uncomplimentary remarks about the weather of the past three weeks, I proceeded to photograph the new layout by my mental camera.

A newly erected office, built entirely of vitrified brick and finished in yellow pine and two coats of hard oil finish, lies to the eastward and overlooking the clay banks and the tracks of the Pennsylvania and Reading Railroad, communicates with the smithy and boiler room, with its two fine Coatesville boilers of 100 horse power each, and a floor space of forty feet by forty, which in turn opens into the thirty-eight by forty foot engine room, wherein standing and working up to the



The New Machine House.

top notch is the recent acquisition in the shape of a Hall & Fountaine slide engine of 350 horse power.

Emerging from this I found myself in the dry pan shed, devoted entirely to the use of the nine-foot pans, one being a relic of the late fire, but in fairly good condition, except, perhaps, its need of a little extra blocking up. The repress room runs through and parallel with the above and occupied a space of forty feet front and a depth of 112 feet, and next to this is the dry house, ninety by sixty-four, with the fan and engine house fifteen by twenty feet at the north end. Here the new track has been laid so that the brick can be hacked direct to



the kilns. So much for the layout proper, with the new installment of the three Raymond Presses, and one Chambers big brick machine, the plant is now in the best possible working condition and almost defies improvement.

Directly facing the railroad track, and in direct juxtaposition to the cars stand four Eudaly kilns, and two improved centre draft. These differ somewhat from the Eudaly kilns, inasmuch as these are divided in the kiln bottoms by two large centre



McAVOYS PAVING BRICK WORKS—Loading a Car of Pavers—  
"Frank" says they are "all right" and the "Boss" is satisfied.

flues, connecting with the centre chimneys, thus permitting the heat to be driven to the centre, or along and out of the sides as occasion may require. This is obtained by having a series of dampers, and by opening or closing them the heat is divided as to give an almost positive assurance of having the brick burnt with an equitable distribution of heat. The six kilns face the railroad and side track, thus permitting an easy hacking from kiln to car. The capacity of all six kilns is 150,000 each.

The dry house running north and south measures ninety by

sixty-four feet, runs parallel with the machine room, this latter having been extended, now has a frontage of forty feet and a depth of 112 feet, with three represses, and a transfer track in the front to the drying shed, and one in the rear for transfer to kilns. At the far end and corner of the dry house is located the fan house in which has been installed a Buffalo 130 inch fan driven by a thirty horse power engine. The hot air dryer utilizes a portion of the heat from the kilns by being pumped into the dryer by the Buffalo fan, thus distributing through the underground conduits divided by the sectional dampers, a high or low temperature of heat as may be required over the sixteen track dryer having a capacity of 90,000 brick. Last year they opened with nothing and closed with the same amount, but succeeding in the interim in turning out 9,000,000 and carrying over orders for 5,000,000. This year it is expected 13,000,000 will be turned out, but it is quite problematical as to this being a sufficiency. Nearly all Norristown is to be repaved and Frank has secured a good slice of the cake in the shape of a contract for 6,000,000, two delivered and four to go. While down here in the city one contractor has dealt out to him a contract for twenty to thirty streets and he don't happen to dislike Frank McAvoy or his brick. This city demands in its specifications a somewhat larger brick than formerly, it now goes into the kiln measuring  $9 \times 2\frac{3}{4} \times 4\frac{1}{2}$  in order to insure the specific size,  $8\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{4}$ .

Thus seventy men are kept going all the year around, including young Tom and his gang at the clay bank, to say nothing of the force at the swell office of the German-American Trust Company building, at Broad and Arch streets, Philadelphia.

The company just now concluded a deal with the owners of the plant at Pine Grove, Pa., about 100 miles from this city. It's a good yard, I am told, but wants pushing, and Frank McAvoy's sturdy shoulders are equal to the task. They have six round kilns and can turn out 3,000,000 annually. So, with a good eye, and a long head Frank takes the entire output. Mark my words, he is just in there right up to his waist, and that plant will turn out 12,000,000 to 15,000,000 in another year from now.

His problem at present is regulated by the law of demand and supply, and the former outruns the latter, it's a pretty good indication that the man isn't lying awake nights, wondering what he ought to take to keep down that dark dyspeptic feeling generally brought on by business depressions.

Nothing succeeds like success. W. P. LOCKINGTON.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK—Tenth Paper.

—Glazed Brick.—

WHEN WE SAID, in a previous paper, that only buff burning clays, so-called No. 2 fire clays, free from concretionary iron are suitable for glazed brick, we made a somewhat rigid but yet proper statement. With a clay of the description success in glazing should almost be certain. But our definition of a good clay for the purpose is a little too narrow, for there are a few buff clays which are absolutely free from concretionary iron. By the latter term we mean, of course, free iron, usually sulphides. We need not reject clays that have but very small amounts of the objectionable compound, which is brought to the surface only by the higher heats. In order to remove the pyrites the clay would have to be washed, and this is a process with which our brickmakers do not care to become acquainted, also for a small quantity of the iron it would not be worth the trouble. In fact, washing could not enter into calculation at all where the brick to be glazed are taken from the pressed brick sheds.

That in the burning of a clay containing ever so little of the pyrites precaution must be taken to burn the brick at a temperature below that at which the iron "boils" out is self-evident, and the melting point of the glaze must be adjusted to



a temperature within the safe limit. Yet the fact that a glaze maturing much below cone No. 4 cannot be considered safe for exposure to the weather, must not be overlooked. The brick body, also, must receive due attention. It should be vitrified, or as nearly so as possible, for it must be remembered that a glazed brick is more liable to destruction by the action of frost than an unglazed one. No pains should be spared to determine just what heat your clay will stand without showing serious discolorations owing to fused iron silicates. Likewise, it is essential that the glaze be adjusted to the body at

—The Highest Possible Melting Point.—

The higher the melting point the more durable will the



Young Tom McAvoy and his Gang at the Shale Bank.

glaze be, and the less trouble will be experienced in producing satisfactory ware. It is a notorious fact that the low-fusing glazes are the most troublesome ones. Preliminary experiments should be conducted with the greatest care and judgment. Hurried trials, made without a definite system are worse than useless. Allowance should always be made for trials burnt in small test kilns. The results may be better or worse than those obtained in the large kiln, yet the main facts will be arrived at even in a poorly constructed trial kiln. The writer has found that in his test kiln the trials invariably came out inferior to the ware burnt in the large kiln. For rapid work an up-draft kiln, about 8 feet in height and with a working space of 24 inches, by 30x36, fired by a furnace 48x22 inches has been found quite satisfactory. A thirty foot stack is ample for two such kilns. The distance between grate and kiln chamber in the case of an up-draft kiln should be as great as possible, and should be filled up with checker work. This is quite important in order to obtain better combustion and to check the flying ashes. The furnace is best provided with a dead-plate, so that the green fuel need not be put on the grate, but has a chance to coke. From the kiln space the gases escape through a narrow slit above the chamber. By means of a fire clay tile the exit can be easily regulated and a very even temperature may thus be maintained. The heat is best determined by the pyrometric cones, than which there is no more efficient help given to the burner. Not only in testing, but also in the large kilns, their use should certainly be adopted. As has been said before, the preliminary work should be systematic—experiments without a definite aim and without producing logical results are of little value. The peculiarities of a glaze, its melting point, its safe limit between crazing and shivering, “running” and devitrification, color, etc., should be clearly defined before an attempt

is made to produce ware on a commercial scale. It should be remembered that experimenting in a test kiln is cheaper by far than compulsory experiments on a large scale.

—Who Is to Do the Preliminary Work?—

To the owner or manager it should be said: If you cannot afford the time and work to study the theory and application of the principles governing glazes yourself, then engage a man who has mastered the subject theoretically and practically. If possible he should be a chemist, or at least be familiar with chemical facts and calculations. Such a man may ask for a comparatively high salary, but his services will be worth all he gets. A word of caution, however, in regard to glazers is perhaps not out of place. There is a class of men claiming proficiency in the glazing and enameling of clay ware, who actually do not know the first principles of the business. Let the manufacturer beware of men of that glass. Quite often these persons are glib of address and ready in their assurances, but they almost invariably, after a well-paid period of experimenting, fail to show any tangible results of their work. The writer ventures the assertion that it is better to take a young man, just from a technical school, and set him to work on the problem of glazing, than to engage one of the itinerate glazers who can give no sufficient proof of past success.

A word, also, in reference to glaze receipts. It is not a difficult matter to collect glaze receipts of all descriptions, but it is quite another thing to make practical use of them. If it were possible to collect evidence on the subject, it could certainly be proven that almost all of the successful glazed ware manufacturers have developed their own glaze compositions, and have not taken them from receipt books. It is almost self-evident that, if the principles of glazes are not understood, a glaze receipt is of little use to the prospective manufacturer, and it is a dangerous practice to depend on a receipt book, be it ever so expensive. To the person, having had sufficient



The Row of Eudaly Kilns.

chemical training, however, a book of receipts is not only interesting but may prove of considerable value.

Much help will be derived from a list of the chemical composition of the Seger cones. One is thus enabled to select a composition corresponding to a certain melting point. For instance, in the case of a buff brick manufacturer who intends to produce glazed brick, the composition of cone No. 4 may be used as a starting point. Its formula, .3 K<sub>2</sub>O, .7 CaO, .5 Al<sub>2</sub>O<sub>3</sub>, 4 SiO<sub>2</sub>, may be represented by a composition obtained by mixing 83.5 parts (by weight) of feldspar, 35 of whiting, 54 of flint and 25.9 of kaolin, if the ingredients are pure. As this is seldom the case, some slight varia-



tion will always be necessary. At about cone No. 7 this mixture should melt to a glass. The adjustment to the body is usually accomplished by either adding silica (flint) in the Owing to the absence of iron, lead or any other reducible compound the glaze is not sensitive to reducing kiln conditions, it cannot be spoiled by bad firing. For colors it is always best to take away from the glaze a portion of the lime equivalent in weight to the amount of coloring oxide added. It is thus possible to maintain the different colored glazes at about the same temperature. For glazes melting at temperatures exceeding Cone 4, the presence of boracic acid, which is prescribed in many receipts, is entirely uncalled for, as for this heat a glaze compound of insoluble materials, is easily prepared. Borax and alkaline, soluble compounds are proper in glazes melting below cone No. 1, where the alkalies cannot be brought in by feldspar alone, but must be introduced by fritts.

—Fritting is a Necessary Evil—

being equivalent to extra cost and should be avoided wherever possible, that is wherever the fluxes can be used in an insoluble form.

A glazer should not only be able to compound a suitable glaze composition, but he should also be familiar with the financial part of the business, with burning, kilns, the most economical arrangement of the dipping process, setting, and he should have a fair knowledge of machinery, as presses, etc. A man of this description does not prepare a glaze costing 8 cents per pound if one for 6 cents will be just as good. He does not employ more men than necessary nor will he consent to hurrying the workmen, which may mean poor work. He keeps close watch of the trimming, setting and burning, sees that every imperfect brick is rejected before it enters the kiln, and tries his best to raise the percentage of good brick from kiln to kiln. The glazer may not be called upon to perform these various duties but he should be able to do so.

—The Manufacture of Glazed Brick.—

Now a few words in regard to the manufacture of glazed brick. The brick to be glazed may have been made by the plastic or the dry press process. Whether the one or the other, in either case, the clay must be thoroughly well prepared. Coarse, poorly tempered or ground clay will be certain to cause defects in the brick which again will give rise to unequalities or other blemishes in the glazed surface. The pressing of the brick is of importance in as much as it must give to them perfect shape and uniformity of size. As far as homogeneity and shape are concerned the dry press process would be in the advantage were it not for the fact that a green dry pressed brick cannot be glazed in the ordinary way. Owing to the porous structure of the green brick the water of the glaze is absorbed so rapidly that the clay at the surface is made plastic too suddenly and invariably a more or less thick crust breaks off. It may be possible to glaze green dry pressed brick by applying the glaze with the aid of some glue-like paste, like dextrine, but the writer has never seen it done. Hence it is evident that the glazed dry pressed brick must be burned twice and this is a disadvantage against the plastic made brick. The latter can be finished in one burning, the melting point of the glaze coinciding with the maturing heat of the body. However often it is found advantageous to burn plastic brick twice, it being claimed that a larger percentage of first class ware is obtained by the two fire process. Whether or not this is true for all clays cannot be said off-hand, without extensive experiments. Good glazed brick are manufactured by both processes and it seems to be a matter depending mainly upon the individual characteristics of a clay, such as shrinkage and structure. Outside of the single and double fire process there are two ways of attaching the glaze to the brick. It may be put directly onto the surface or an intermediary layer may be applied, a slip, which forms a sort of bond between the

stone-like body and the vitreous glaze. The slip usually is a glaze requiring a higher temperature to melt than is attained in the kiln. Properly, it should vitrify at the point at which the glaze fuses. In the case of our glaze, which one assumed to correspond in composition to cone N. 4, the slip ought to have the composition of about cone No. 6. The uses of a slip are two fold, viz.: It presents an even surface on which the glaze may melt to a smooth coating and it produces opacity, that is it completely hides the color of the body. Both desideratums are of great importance especially the latter where off colored brick are used. For instance where a dark colored body is to be covered with a light colored glaze, we can either make the glaze opaque, so that it is an enamel or we can apply a white slip first and then a transparent glaze. Opacity may be produced by adding phosphate of lime or tin oxide in the glaze or by having one of the bases, like lime in excess over the rest of the fluxes, or finally by changing the ratio of silica to alumina considerably above or below the ratio 1:8. In practice, however, the slip process is the most satisfactory and the safest.

The manner of setting the glazed brick depends upon the character of the glaze. A glaze which "runs" requires that the brick be set with the glazed surface level. It is also a fact that the easily fusing glazes are the most sensitive to fire, as many of them contain lead. A glaze which is equivalent to cone No. 4 in composition does not "run" and may be safely burnt on a vertical surface. Light and delicate colors should properly be burned in saggars, while creams and browns can be set like ornamental brick, with protected faces. The cost of burning in saggars is not as great as is usually supposed and the percentage is always much greater than in the case of brick not so protected. Lead glazes should always be burned in saggars.

Glazed brick can be burned satisfactorily in any kiln in which the heat can be spread evenly and to the desired degree. The condition of the fire gases must as a rule be oxidizing except in the case of some chromium colors. A square down draft kiln holding not more than 20,000 brick is about as good a kiln as any for this purpose. Seger cones should always be used to determine the finishing point. AMERICUS.

### THE BURNING QUESTION.

A SERIES OF ARTICLES on kilns for burning clay wares will appear in this journal, commencing with the September issue. The purpose will not be to cover the whole field, but only that portion of it which has to do with face brick, pavers, and goods of higher grade; at least this is the present intention. The best kilns and the best practice of to-day, as witnessed by the results obtained is what the clay worker is most desirous of knowing about. We have already been well posted on the kilns of ancient Assyria and Egypt—the year 1897 is far enough back for our wanderings in the present case.

All who have kilns which they deem possess special and superior qualities, whether kiln builders, patentees, or users, are invited to contribute to the general fund of information. So far as it is practical the language of the contributor (abbreviated if need be), and the name also, will be made use of, where there is no request to the contrary. It is hoped, however, that none will hesitate to stand by their statements. The thing desired is a clear description of any feature of a kiln that has been found to be of value, as an economizer of fuel, time or labor, or as resulting in an improved product. Where a verbal description will not make the feature clear to the reader, sketches should be sent, not necessarily finished drawings, as they can be copied and brought into harmony with other illustrations—of course, finished drawings will be appreciated.

Definite statements made of results obtained, covering, size of kiln, thickness of wall, character of flow, spring of arch,



dimensions of stack, kind and quality of fuel used, length of time in firing, number of fire holes, grate surface of each, door or otherwise, up or down-draft, character of wares burned, etc., etc., will all enter into the account, except as some change made in an ordinary kiln, secures given results, which may be briefly contrasted with former results.

Another important field of inquiry relates to the utilization of the waste heat of kiln, how attained, and with what results. Of course, all know fuels and clays vary in character and at the same time the value of improved methods or devices can be determined by results as compared with former practice. It is desired that all information may be in hand by August 15th in order to classify and properly arrange. Our own experience leads us to believe that clayworkers generally are hungry for such information in a condensed form. Address all communications to The Clay-Worker on or before date given. Ideas or suggestions not yet put into practice will be gladly received as furnishing food for reflection, as will any statement of a need not provided for, or if provided for, not known to the correspondent.

FLAME.

Written for the CLAY-WORKER.

# FIRE RESISTING MATERIALS AND THEIR USE IN CONSTRUCTION, MAKING FIRE RETARDENT OR SLOW BURNING OR POSSIBLY FIRE PROOF BUILDINGS.

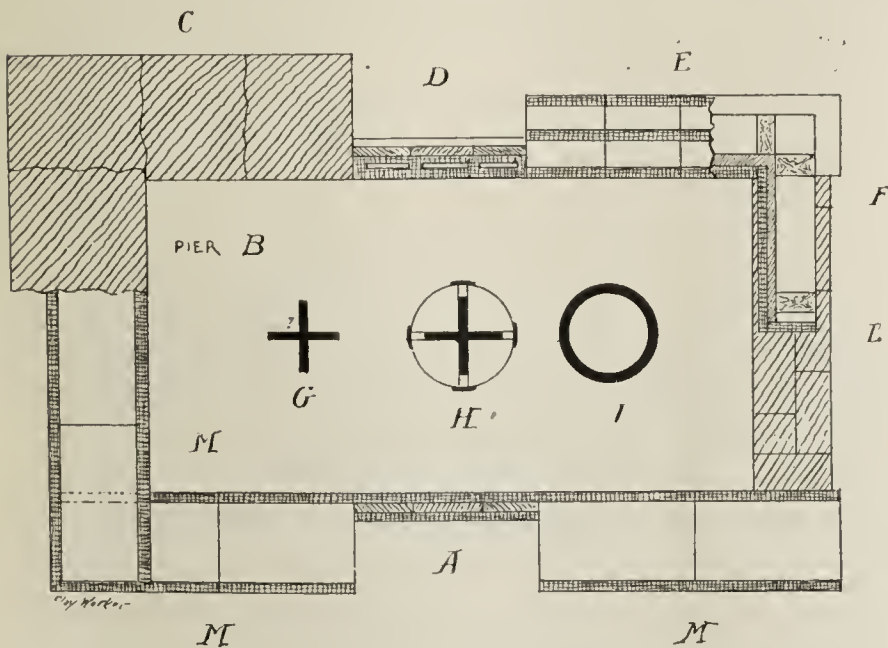
BY SANFORD E. LORING.



INTEREST SHOWN at the late Pittsburg Convention on the subject of clay and its relation to fire-resisting buildings, is an indication of the truth of the saying, "That all matters that relate to the salvage of human life and labor never grow old," and every detail that illustrates any practical phase of the subject will always seem new and interesting to the great majority of our human family.

With these thoughts in mind, I send you some details of tests made under my personal observation, having as an end in view, the practical conclusions that, as an architect and clay manufacturer, I drew out of the results of many similar tests.

It says that shoemakers claim there is nothing like leather, and I think it is equally true that clay men are in danger of forgetting that other materials are just as essential in the making up of useful and beautiful and substantial and fire-resisting buildings as clay. The path of wisdom in this matter will



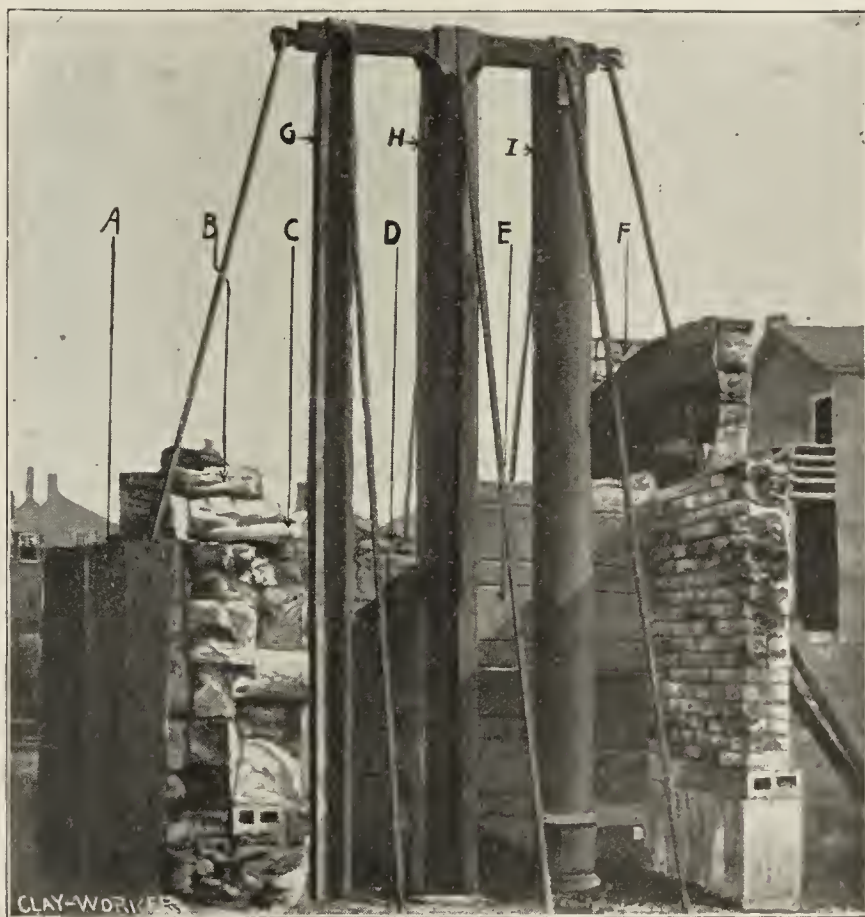
lead us to give to each its proper credit and put each in the place where it can serve its highest possible use. Let us aim to be wise in this work and success will surely crown our efforts.

The following tests of various building materials by fire and water give us an excellent illustration of the value of wood as a non-conducting jacket to protect a metallic column or beam,

and prevent its destruction by its absorption of and expansion by heat during a fire test, and it gives us a still more remarkable illustration of the value of good porous or cellular terra cotta to protect both wood and metal from the same danger and destruction.

Figure 1 is a ground plan of a test furnace that was built in Chicago some years ago for the purpose of testing Drake & Wight's fire and water resisting column and various materials used in building construction. The walls were six feet high and in sections or piers. Pier B was of sandstone; C was of limestone; D of wood faced with hollow porous terra cotta tiles; A was of wood sheathing faced with porous tiles one inch thick; K was of hollow fire clay tiles; L was of common brick, eight inches thick; M was of hollow porous terra cotta flue tiles. Within these walls there was three iron columns, two unprotected and one protected with gores of oak that served as a non-conducting jacket designed to prevent the iron core from absorbing heat and expanding during the fire test.

This compound column was known as Drake & Wight's fire and water resisting column. The following abstracts from let-



View of Columns, etc., after the Test by Fire and Water.

ters written by P. B. Wight, architect, and by Ducat & Lyon, agents of the Home Insurance Company, by H. L. Gay, architect, W. W. Boyington, architect, and P. J. Sexton, builder, describe some of the results of the tests which they witnessed:

"The fire test was in a brick and terra cotta furnace. A fire of light wood was maintained for an hour and a half. At the end of an hour the difference of expansion between your column (Drake & Wight's) and the unprotected column was seven-eighths of an inch, showing a great difference in amount of heat absorbed. After half an hour longer, one side of furnace was torn down and a stream of water was directed upon all columns while the fire was raging with great intensity. The cylindrical column bent two or three inches from straight line, and both unprotected columns were rendered unable to carry their load in a building; the protected column remained upright, the wood gores charred one inch deep, the remainder of wood sound. Their test demonstrated that the column protected with wood would do its work where heat and water would have destroyed plain iron columns."

Mr. P. B. Wight wrote: "The combination of iron and oak was my first invention of fire proof columns. When this fire



test was made, part of the furnace was made of pine boards covered with porous terra cotta tiles one inch thick on the side toward the fire and plastered with cement. The tiles which covered this woodwork were removed after the fire was out, and there was not the least indication of charring. I then concluded to use porous terra cotta as a substitute for wood for fire proofing columns in buildings in which a superior exterior finish was required, etc."

After this fire and water test a photographic view of the interior part of this furnace was taken, which shows the comparative effect of fire and water upon these various materials. From this it can be seen that the stone work was badly injured, the faces of the piers broken off and scaled from six to twelve inches in depth; the hollow fire clay tiles cracked and their faces near the top were broken off; the brick were not seriously injured; the porous terra cotta tiles were uninjured and remained firmly attached to the wood sheathing and frame, which, as stated by Mr. Wight, was not even charred. This fire test, lasting nearly two hours, showed the comparative value of these materials as fire proof envelopes, or as fire resisting materials when used in the constructive parts of buildings. They should teach us how and where to use these materials, in order to secure reliable and substantial results in fire proof and fire resisting building. It is only in extraordinary cases that enough material is stored in one place to supply the fuel required to keep a fire burning more than an hour.

It is fair then to assume that this test was as severe a trial as ordinary buildings would ever be called on to resist, and these results can therefore be used as a safe basis for calculating the amount and kind of material that is required to make a fire resisting building of any desired value. In the light of this and many other similar tests that I have witnessed, and made, before and after this trial of October, '74, I never for a moment doubted my ability to make a reliable and comparatively inexpensive fire proof building.

I regret to say, however, that of the many materials I have seen tested the only one that passed successfully through all these tests of fire and water and frost without disintegration was good (with the accent on the good) porous terra cotta. Good porous terra cotta can only be made by having the air cells evenly distributed by the thorough mixing of the combustible materials with the clay, and then having their body thoroughly dried and burned. This quality of porous or cellular terra cotta you can always depend on. It illustrates the truth, that a little good and suitable material, mixed with honest and intelligent human labor, can be made to do any and every good work and supply any demand that the welfare and safety of the public requires.

And so, my fellow-clayworkers, with this truth well in mind, let us strive to put more intelligent, conscientious human labor and less raw material into your manufactures, and I am certain you will get results of which we shall all be proud, and of a quality of which none need be ashamed. We know that this is not the universal or present condition of our works and of our work; but let us all pull together, aim high, and make a free exchange of our experiences and we'll soon get there with both feet.

Referring again to the photographic view of fire test, I call special attention to the section of an ordinary balloon frame wooden wall, which was faced with porous tiles  $\frac{3}{4}$  inch thick. It was set up on the walls of the furnace on the corner towards which the wind was blowing, so that the flames from the furnace fires were blown against it during the entire ninety minutes' test. Not a spot was charred, showing the extraordinary non-conducting value of the porous covering tiles. The live coals of the body of the fire rested against the covering tiles of the pier A during the test, and only a slight charring in a spot smaller than one's hand could be found when the tiles were stripped off and the woodwork exposed to view. These boards were removed and set up against the stone pier shown on the

left of this photograph. This picture was taken from an original photograph on which these boards had been painted yellow to indicate wood, and in the photographic copy they appear black where in the original they showed the light color of uncharred woodwork. The wooden pier D, on the opposite side, which was covered with a double thickness of porous terra cotta and an intervening air space, was made of unseasoned lumber, and at the end of the test so little heat had passed through this hollow tiling that the boards had not dried, and were left in the same green state as when first set up in this furnace wall.

Similar tests were made in Boston in 1881, and in addition some very severe frost tests were also made. The following fragment from the committee of experts' report show the same remarkable result:

"Building Material and Construction." "Judges, Jos. Ham, John Evans, Hugh F. Meany. "Exhibit No. 1482, S. E. Loring and T. A. Johnson, Boston, Mass.—Porous Terra Cotta: Drawings and Photographs illustrating Loring's Method of Fire-proofing, and Test of Material; Model of Roof, Floor and Wall Construction. The material used, for covering roofs, etc., combines non-conductibility is due to its porosity; the indestructibility to the fact that it is composed of fine clay, with no other ingredients. On account of its porous and elastic nature it is not liable to be cracked by sudden cooling, produced by throwing on of water. A highly commendable invention, and worthy of great credit. "SILVER MEDAL."

"Buildings may be protected and partially fire-proofed, using posts, columns and girders of wood or iron, thoroughly encased in a fire proof material, these holding firmly together and supporting the principal parts of the interior and exterior, and rendering such building less liable to fall in case of fire, and leaving them in condition to repair at a relatively small expense. We regard as essential qualities in a perfect material for general use in fire proof building construction the power to successfully resist disintegration by the action of fire, water and frost. Loring's porous terra cotta, as tested, has satisfied us that this material can be made to possess all these qualities. A perfect sample, when cut, resembles pumice stone, the substance being well burned clay; the porosity increased its power as a non-conductor, and enables it to resist sudden and extreme changes of temperature without liability to fracture; renders the body penetrable so that nails, screws, or other metallic fastenings can be driven into it to secure it to or about the constructive frame work which it covers and protects; or to attach slate, tile or other weather-proof covering to this material, when used as a substitute for ordinary wall, floor or roof sheathing. It also increases its power of suction, making it the best possible material for receiving plastic cement, asphalt, etc., when used with these and other materials for the exterior and interior groundwork and finish. The terra cotta, submitted to these tests, gave evidence in a remarkable degree of its ability to protect iron beams and columns from the action of fire and water without fracture or disintegration, as well as to insure the complete security of wood from the action of the flames, so that not the least charring was observed where it was protected by Loring's porous terra cotta.

"Signed,

"JOHN S. DAMRELL.

"WM. A. GREEN.

"OLIVER L. SHAW.

"Committee."

At the time of this test in 1881 a large variety of other materials were also tested, but the committee stated as a reason for not speaking about them in their report, "that as all the materials had failed to stand the fire, water and frost tests, except Loring's porous terra cotta, that the kindest thing that they could do would be to say nothing about them.,,

There was a decrease of \$10,000,000 in the debt of the United States during the month of June. This is the more significant as the decrease takes place in spite of an enormous war expenditure, that is bulging out in not a very agreeable way to the tax-payer and the financial unfortunate who fails to see his way out of the woods. It is a matter of congratulation, however, that though the leakage in the pail may be continuous, the water coming in is more than that running out. The country is showing a surprising ability in financial recuperation, and though it has serious odds to contend with, it is coming out at the top with a decreasing national debt.—Age of Steel.





## INDIANA'S BABY BRICK YARD.

THERE IS A NEW addition to the family of brick yards in Hoosierdom. As new arrivals are always interesting we gladly accepted an invitation to visit the new plant and take a peep at the babe, which is an offspring of the Sheridan Brick Works. It is located half a mile from the limits of Brazil, formerly known as a mining town, but which is now an important commercial center. Brazil is fifty-seven miles west of Indianapolis, and undoubtedly is destined to be the leading clay centre of Indiana, for there are vast deposits of all grades of clay in that section and an inexhaustible supply of coal. These with splendid railroad facilities for shipping insures the greatness of the Brazil territory as a clayworking center. There are now in operation in that vicinity several extensive sewer pipe, paving brick, hollow block, and fire clay manufactories, all of which are busy and prosperous. We shall have something more to say of these later on, just now we must devote our attention to

## —The Sheridan Brick Works.—

The parent plant was established in '92 by J. C. Adams, "the brick maker to the President," and O. H. Root, a good combination, for the former is a born and bred brick maker, as our readers well know, and Mr. Root is a "natural born hustler." The advent of natural gas had minimized the coal business of this section, in which he had been a leading factor, so it was but natural for him to turn to the natural gas belt as a new field of operation and chose brick making for an occupation. He proved an apt scholar, and in a few years bought out Mr. Adams, and has since had entire charge of the business, making and marketing 14,000,000 brick a year. Two years ago gas showed signs of failing, additional wells were driven, but the pressure grew less and less, till now it is with difficulty they

can get enough gas to burn their brick. Other fuel is too expensive in that vicinity to enable them to compete with the brick from the coal region, so Mr. Root determined to build a new plant and the works at Brazil is the result. Associated with Mr. Root in the new works is Mr. M. J. Osgood, one of our wealthiest citizens. Though well advanced in years—he is over seventy—he takes an active interest in the work, and makes frequent trips to Brazil to see that all goes well. They have twenty acres of land which contain sufficient clay to keep the plant running continuously for several generations. It lies along the main line of the Chicago & Eastern Illinois Railway and within a few rods of the Vandalia Line, a part of the Pennsylvania system. A spur track from each road runs into the plant and along side the kilns.

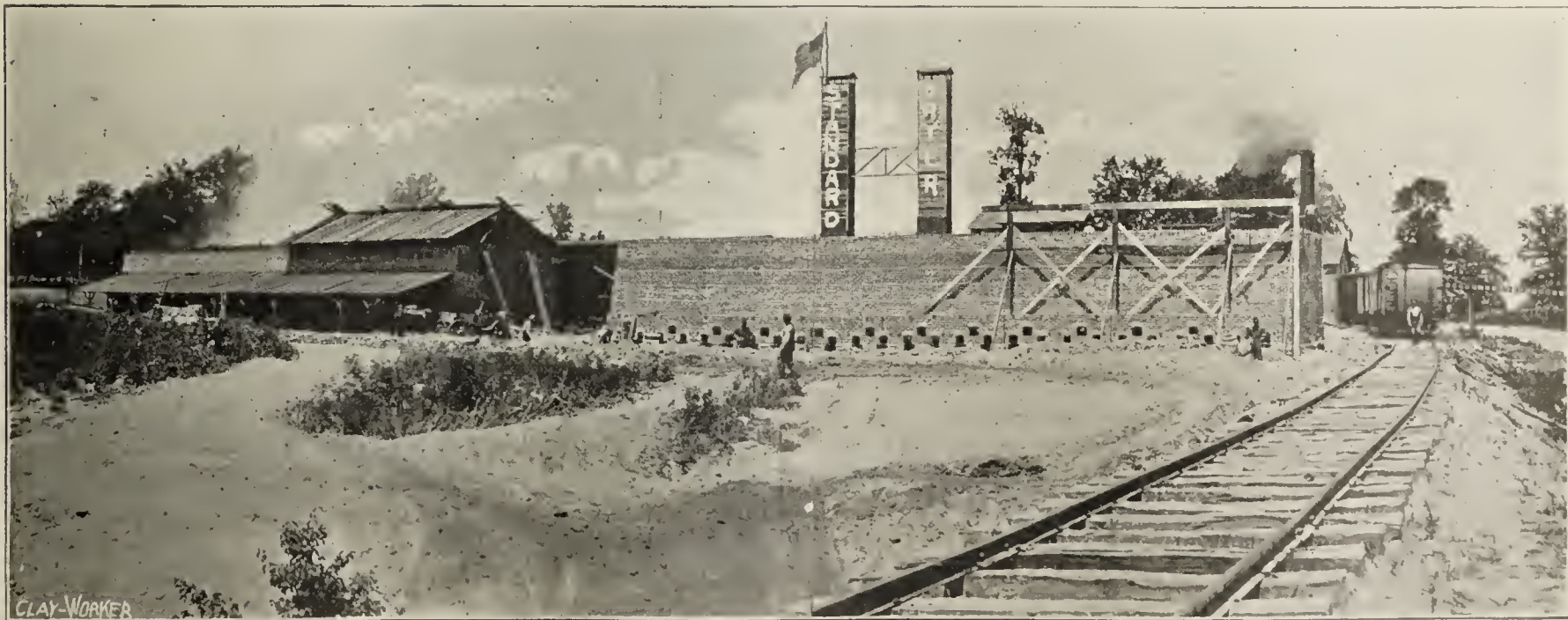
## —Splendid Clay Deposits.—

The top clay is from eleven to thirteen feet in depth, is somewhat sandy, burns red and makes a good common brick, beneath it is twenty-two feet of blue shale, then an eighteen-inch vein of coal, next nine feet of good fire clay, another stratum of shale averaging about sixteen feet, then nine feet of hard fire clay, underlaid with four feet of good block coal and then more shale. Should they desire to go into the paving brick business they can do so very nicely.



Mr. Woolley in a Strange Attitude.

They broke ground for the new plant February 1st, and began to make brick June 1st, good time considering the delays incident to bad weather, etc. They are now using their top clay thrown out in excavating for building foundations, etc., but will probably use a mixture of clay and shale when the yard is cleaned up and work settles down to common routine conditions. The shale will be taken from the base of the hill from which a fine substantial trestle 250 feet in length has been built. It is double tracked, with steel rails the entire length. The shale is hauled up in side dump cars of special design, each holding two and a

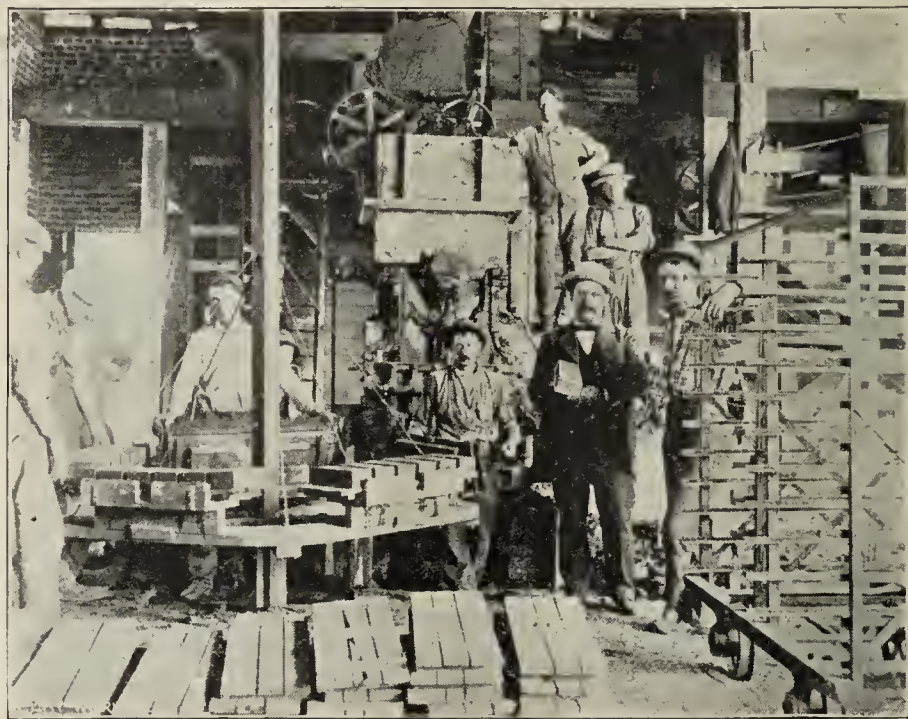


The Sheridan Brick Co's New Works—Side View, Showing Completed and Unfinished Swift Kiln, Dryer in the Back Ground.



half yards. There are two hoisting drums, which are so constructed as to work together or separately, either track can be used regardless of the other, or the drums can be coupled together, and both cables used at once. When worked together the empty car helps pull up the loaded car. The scheme was suggested by Mr. Osgood and worked out very successfully by W. J. Woolley, from whose shops at Anderson, Ind., the brick machinery and appliances were supplied. From the cars the shale is dumped into immense bins, which hold enough to run the works several days, so there need be no shut down during extremely bad weather. Near the base of the bin is a nine-foot Woolley dry pan which reduces the rock-like mass to powder, and a cup elevator carries it up to screens above, from which it goes to an "Iron King" brick machine. The surface clay is hauled to the rear of this machine in one horse dump carts. It is carried up on a belt conveyor and run through a Potts Disintegrator and thence into the same Iron King. In this way either material may be used separately or together as desired. The Iron King seems to be the special pride of the entire working force. The superintendent says he is "stuck on it." Mr. Root praised it lavishly while Mr. Woolley, who accompanied us to the works, naturally showed a fatherly pride in its success. Watch in hand, we counted twelve molds a minute and observed that the brick came out square and firm, being

stallation of another similar equipment of machinery, dryer, etc., giving them double the present capacity. We surmise that in the near future the old works at Sheridan, which are



Mr. Woolley finds the Iron King Molding the Brick so Stiff they can be Handled with Safety.

still in operation, will be abandoned and the machinery transferred to the Brazil plant.

#### DOWN IN JERSEY.

WHILE PASSING through South River last week, we noticed the Red River plants were all in operation. The weather for the past six weeks could not be better for this class of work, it has been perfect with hot suns to dry the brick. The various clay shippers have been handicapped by the war, but as Uncle Sam has knocked the "stuffin" out of the Spaniards, everything looks bright for a boom in building soon. A new terra cotta works is building in Tottenville, just across the sound from Perth Amboy. I have not, as yet been able to get data from them, but will try to do so soon. I understand the plant is to be built on a large scale and has plenty backing in the way of capital. As the works are directly on the Sound & Staten Island Rapid Transit R. R., their shipping facilities are good. The erection of a large copper smelting plant upon the old John R. Watson fire brick location at Perth Amboy, is



The Shale Bank.

molded so stiff that they could be handled safely. Dumped on pallets placed on a revolving table, the brick were placed on iron rack cars, furnished by the Standard Dry Kiln Co., and run into a "Standard" steam heated dryer, in which they remain forty-eight hours. There are twelve tunnels, 116 feet in length, holding eighty odd thousand brick. The brick dry without cracking, there being comparatively no loss from that source, and are burned in a Swift up draft kiln, of which they now have two, and will build five more, each holding nearly half a million brick.

The first kiln was filled and they started the fires June 26, closed it July 7, and opened it the 9th, and were delighted to find a good uniform burn, the brick being hard right up to the top course. They are a good dark red and "ring like a bell." Nothing but coal slack was used from start to finish, and not a great deal of that, so little indeed that Mr. Root is confident that with the Swift furnace he can burn as cheaply as he has been doing at the old plant with gas. "You can say," he said, that the Swift furnace is an unqualified success. I never expected to burn brick so cheap with coal."

The yard is in charge of Mr. G. E. Luce, who designed and superintended the erection of the works. He modestly styles himself a greenhorn brickmaker, but his work proves him to be an adapt workman. The plan of the yard contemplates the in-



A Load of Shale on the Way up.

now under way and will no doubt consume large quantities of both red and fire brick.

This makes the second smelting company in Perth Amboy and will no doubt lead to others coming. All the factories are still in operation, but the war having stopped building to a



certain extent, the demand for material has been comparatively light. But we predict one of the greatest revivals in building we have ever had after peace has been declared.

Perth Amboy, N. J., 7-7-'98.

W. R. O.

Written for the CLAY-WORKER.

### A PROSPEROUS YANKEE COMMUNITY.

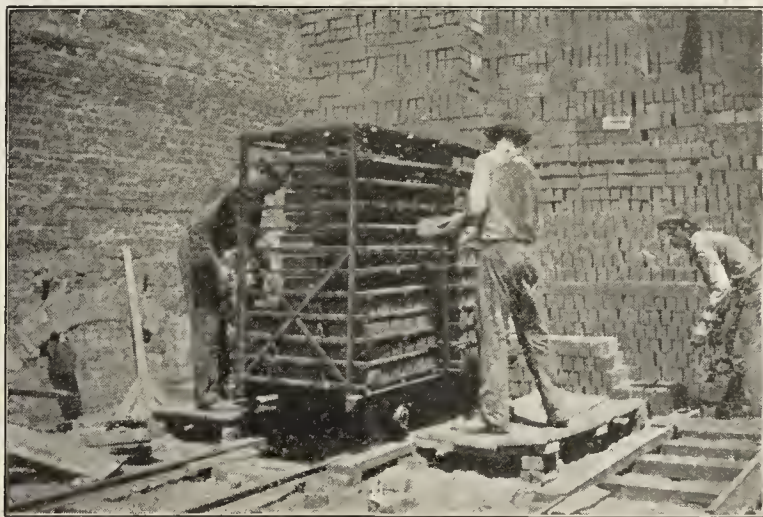


MASSACHUSETTS IS not afflicted to any dangerous degree with the modesty which forbids the blowing of "your own horn," and so, while Boston primps itself and proclaims boastfully to the world that it is the "Hub of the Universe," Worcester, 44 miles west, sends out a gladsome shout that she is the "Heart of the Commonwealth."

There are many symptoms of "big head" about the Bay State, and of Worcester's claim to being the heart is undisputed, the conclusion to be reached immediately is that the Commonwealth is experiencing a rapid enlargement of the heart also. Worcester is using more brick than any New England city out-

smooth as the nicest floor, while the pavements of other materials shows some signs of the heavy traffic. The asphaltina pavement stands next to brick as a durable and satisfactory pavement, granite and blue stone pavement coming next.

Large paving blocks of vitrified clay have been laid in the crossings in the center of the city and seem to be proving themselves worthy material. The blocks when laid show a surface about 12 inches long by 4 inches wide. They are of a bluish color, very smooth and hard, and come from the Brookfield yards. These experiments have had the effect of turning the attention of the manufacturers to the manufacture of paving bricks or blocks. They have demonstrated satisfactorily that vitrified clay is good paving when properly made and properly laid. It may be said that there was in Worcester up to the present a decided aversion to brick pavement, even to sidewalks. This arose, it seems, from the abominable bricks that were put into the earlier pavements in Worcester. They were made of a wicked combination of clay and coarse gravel, and were sloppily made and carelessly burned, and recklessly laid in the walk. Such was the nature of the mud that entered into these bricks that even one that was burned a dark red



BRICKYARD SKETCHES—Getting in the Clay, From Dryer to Kiln. Setting in a New Kiln. Ready for Business.

side of Boston this year, and next year she intends to increase her demand. She has already made herself conspicuous among the beautiful cities by the number and variety of her brick apartment houses and hotels and many mammoth business structures. It would seem that Worcester's fondness for brick increases with the years. She has been experimenting with various kinds of paving material, and the tests have shown that brick pavements on the whole are the most satisfactory.

#### —Brick Pavements Best.—

Next year several miles of brick paving will probably be laid. The experiments with paving began last year. Pearl street, a much traveled thoroughfare in the heart of the city, was laid with vitrified brick from yards in Suffolk county. Mechanic street and Foster street, near by Pearl, were laid with Asphaltina pavement. After this Exchange street was paved with vitrified brick for some distance. After nearly a year's test under heavy traffic the brick pavement is sound and

color could be easily ground into dust, that is, except where a rock or pebble lodged in its composition. The bricks were laid in the walks with apparently no thought of the effects of frost, and certainly with no eye to harmony in color for pale bricks and black bricks were mixed in a variegated plan among the red ones in the walk. The frost got in its work quickly on the pale bricks, and the feet of the multitude soon whittled away the softer red bricks. The sidewalks became dangerous pictures of life as she really is, "full of ups and downs," and Worcester men acquired a peculiar style of gait which has been applied to distinguish certain forms of inclinity in later years. The Worcester jag shows the peculiar, cautious and fearful gait of a Worcester citizen of a few years ago traveling a brick walk at night.

#### —A Valuable Hint to Paving Brick Manufacturers.—

Much of the credit of bringing Worcester out of the night of ignorance of brick pavement is undoubtedly due to the manu-



facturers in this vicinity, who saw the wrong that had been done and the way in which it should be righted. Samples were freely given and experimental tests in cross walks and streets were fostered. There is no doubt that the brickmakers have things coming there way now, if they will only see that the best material, and only the best is permitted to go from the yards into a job. With the lesson of the past before them there is no excuse for a second failure.

With the new year the city proposes to make a new departure in the management of its public works. The contract system will be eliminated and the city will do its own construction work. It is claimed by the advocates of the new order that the city can save a million dollars a year in its public works by having the work done by the day under the supervision of the heads of the various departments. The experiments in paving the past year were begun as a part of the program. The city will do its own paving as well as building, and the presumption is that it will do more brick paving for a year or two than anything else.

Worcester is a city of 110,000 people, and its population increases at the rate of 5,000 or so a year for several years, including the present year. Yet with all its population and the market which it offers it has the fewest native brick makers of any city in a clay land. The only yard in the city is within half a mile of the principal square. It is a primitive plant. The old-fashioned circular pit, and the tempering wheel are the same style there to-day that they were in the yards of a century ago. The molding is by hand. The clay is the same dreadful mixture spoken of above. It is difficult at first glance to discern any clay among the pieces of gravel, big and small. It is mined from a hill sixty feet in depth and tempered without preliminary drying. Tempering is the process of removing the greater stones from the batch. When a brick is made it looks as if it was composed entirely of sand and gravel.

#### Migratory Brickmakers.—

The bricks seem to swell in burning, and many of them are spoiled by the warping of their surfaces. The clay burns a dead brown, the rocks in it burning white. The effect is a crumbly and unpleasant-looking brick. About 80 men are employed in the yard. They come by train loads down from Canada in May, and when the season ends in October they catch the first train back for Montreal. They take with them nearly every dollar that they have earned, and live in comfort until another season. Twenty-six dollars a month and board is considered fair pay. They work from 5 a. m. to 7 p. m., and are fed and kept in cheap shanties at the yards. They are steady workers and peaceable, and live solely to enjoy the winter's long rest in Canada.

The setting and burning in this yard, rough as the bricks are and treacherous as the clay is, is fine. I never saw kilns burned such even shades, and from bottom to top and head to head, clean to the scoving and platting the hard bricks are found. They burn by the old method and in four days' time, 100 cords of soft wood to burn 400,000 bricks. How it can be done is a mystery as yet to me. The kilns when burnt are kept neatly trimmed up, and the nice, even setting and uniformity of color mislead the eye and beget the delusion that the bricks are not the roughest in the world. Worcester will use 4,000,000 of them this year, so that the care taken of the kilns is not without its reward. Most of Worcester's fine building bricks come from Brookfield, from Russell and from the yards near Boston.

The Brookfield Brick Company has refitted its great plant and proposes to manufacture paving brick as well as fine front bricks for the Worcester market. The Blandford Brick Works, which were destroyed by fire two years ago, have been rebuilt and have started up again to run both summer and winter in the manufacture of the famous Blandford white bricks, fire bricks, building blocks and paving bricks.

The clay deposit at the Blandford plant at Russell, Mass., is the most peculiar clay deposit in the world. The clay from which the white bricks are made is in its natural state a hard deposit nearly pure white in color. The treasurer of the company, Mr. A. J. Park, says that it is the only clay of its kind known. An analysis of it shows the following:

|                  |       |
|------------------|-------|
| Total water..... | 15.55 |
| Silica.....      | 52.03 |
| Alumina.....     | 31.76 |
| Ox Iron.....     | Trace |
| Magnesia.....    | .51   |
| Lime.....        | Trace |
| Alkalies.....    | Trace |

The bricks are of purest white and make pretty work in buildings. Some of the interior of the eleven-story State Mutual Insurance Building in Worcester is laid with these brick. They are whiter than the white marble trimmings about them.

Besides this peculiar white clay there is in the Blandford bank a good grade of fine clay, a fat streak of common or red brick clay and a mixture which has been found to be wonderfully well adapted to the making of large paving blocks. These blocks have been tried by the city of Worcester with great satisfaction and an increased use of them is noticed. Other peculiar things found in the clay hill are carburendum, which is mixed with profit, gold in small quantities, many imperfect garnets and nearby a beautiful large deposit of pure green marble. The marble is being quarried, and the beauty of its color and texture has created a great demand for it.

The Blandford plant sets in a natural wonderland, but has had its own train of misfortunes. It takes a new lease of life now. It has been refitted with machinery by the American Clay Working Company, and will start with an output of 2,000,000 annually, but the capacity will be enlarged before a year.

The prospects were never better in this section. Throughout the depression following the panic of '93 the "heart of the Commonwealth" kept growing, and now it has felt the steady throb of returning activity. It is bounding. Common bricks have been selling readily at from \$5.50 to \$6.00. The outlook is for even higher prices by spring. The question of labor is the most bothersome one that presents itself to the managers of brick making plants here. It is difficult to get reliable hands to remain in the yards. The plants operating summer and winter feel the most inconvenience, because in them skill and intelligence are more in demand than in the others. A carload of foreign labor does not contain so much available material for them as for the summer yards. The French Canadian is the only race that thinks itself adapted to the business nowadays, and they make good men as a rule, but all use the brickyard more as a stepping stone into other situations than with the idea of making it the occupation of a lifetime. The result is easily shown.

Speaking about antique brick works, I sat to-day in the old Exchange Tavern in Worcester, near the court house, where Gen. Washington, the father of his country, and Lafayette, the friend of liberty sat by the big, old-fashioned fireplace and drank their toddy one day a century or more ago, while on their way by stage from Boston to New York. I forget the exact date, but the old brick fireplace looks the same to-day as it looked to the hero of the war for freedom, and gives promise of holding its own for a century more. BRIAN J. DUNN,

The cost of a naval duel between two modern battle ships in the value of projectiles and the probable damage to structure is estimated as easily approximating \$1,600,000. This little bill would be filled out in the space of sixty minutes, provided all the armament of each ship was in active service for that length of time. Should one or both ships be lost in the fray the loss would add tremendously to the above figures. A few naval battles of any proportion would pauperize a Klondike and make the taxpayer wince. So long as it is a fashion to settle international disputes by these costly and barbaric methods the people must pay the bill, to realize that after all the money dumped into the cellars of Neptune, if put into new enterprises and industries, would make a hobo a rarity and a pauper as scarce as a fifth leg on a calf. Patriotism is one thing, but glory as it is generally understood never yet paid for a red herring.—Age of Steel.



Written for the CLAY-WORKER.

# THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Thirteenth Paper.

BY E. G. DURANT.



OUR LAST PAPER on heating and ventilation in the use of hollow blocks was made somewhat lengthy because it seemed necessary to give much of the space to emphasizing the great importance of ventilation, and in presenting the principles which must be adhered to in successful practice. We left unsolved the question of how the great quantity of fresh air needed for such purpose could be taken into a stove heated apartment (the air often being at zero temperature in our northern climate) without bringing shock and chill with it. It will be remembered that our chimneys were flanked by air flues, and that in a hollow block house such flues are easily incorporated with the walls of a building. The great majority of our people live in stove and furnace-heated apartments. How are their needs to be met? The answer to the query can be stated in few words, viz.: by applying the same principle of handling the needed volume of fresh air before delivering it into the apartment to be heated; that we do in the use of the furnace. Our double-air flue system furnishes all the needed facilities for such purpose that are required outside of the stove or heater.

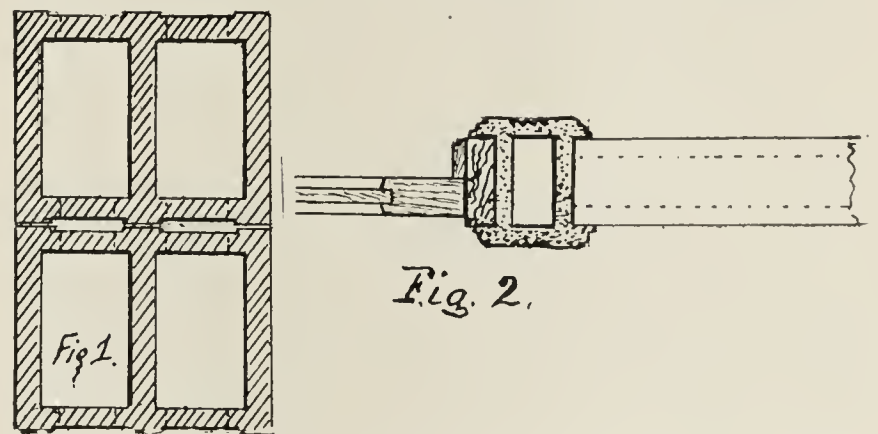
That such heaters are hard to find, adapted to general use, must be admitted. The nearest approach to what is wanted the writer has made use of, viz.: a "Baltimore Fire Place Heater," so-called I suppose because originating in Baltimore, but now made by various companies in other localities. The air introduced at the base of the heater within the jacket that surrounded three sides of it having come in contact with the heated surface, is discharged into the room through the fret work at the top of the heater; the discharge is not as high above the floor by two or three feet as it should be for the best results, as shown by the sketches in our last paper, but the apparatus comes nearer meeting the need than any other known to me. A discharge register into a wall flue at the floor line completes the system.

The demand for such hygienic stoves, to be used independent of a fire place, is sure to be met when made. There will need to be some sacrifice of the ornamental, as so lavishly bestowed on the several-story, mica-windowed, nickel-plated, monumental affairs found in the well-to-do homes of to-day, which, with their thousand and one joints, are well calculated to furnish all the carbonic acid gas required for family use at short notice. A return to the simplicity, in form at least, of the old "air-tight" stove, without the legs to lift it from the floor, "neat but gaudy," homely perhaps, some would say, but sure to furnish a heap of comfort, and to add to the health and well being of a family enjoying the blessings of a hollow block air flued chimney or wall. We have one other suggestion regarding the heating of a hollow block dwelling which will be specially applicable to a mild climate, or to our northern climate, for at least half the period during which artificial heat is required, and which can be brought to meet the requirements made by extreme cold weather also, and for our coldest localities. The experiment has already been tried, but under such unfavorable circumstances and at such cost as to insure speedy introduction. Hollow blocks, however, especially where double-chambered blocks are employed, are so eminently fitted to bring the system—which has undisputed merit—into prominent notice that we feel authorized to refer to it here.

Dr. Billings, whose book on "Heating and Ventilation," which easily stands at the head of publications in this line, so far as known to the writer, describes a house built in France planned by the well-known expert Leeds, in which the

heated air is carried direct from the furnace into a chambered wall, the wall being of brick, has a total thickness of twenty-two inches, consisting of an outer wall nine inches thick and an inner wall of four inches, with an air chamber between of nine inches, the walls being no doubt tied together.

The furnace heat was admitted to wall chamber at 110 to 120 degrees fahrenheit, and the wall temperature on the inside stood at eighty-five to ninety degrees, and results were pronounced very satisfactory. It is evident there was a great waste of heat which the interposition of an outer air chamber would have prevented. We have heard of a similar structure in Virginia, but have not been able to locate it and secure details. Now we all know that the cold in our dwellings in large part comes through our walls, and even our thickest brick walls, as shown in a former paper. With warm walls, you are, under ordinarily favorable circumstances, sure to have a comfortable dwelling. Consider how simple the matter of connecting the heat pipes from a furnace with such a wall as is shown in section, in Fig 1. A double air jacket is shown, the outer one insures against any appreciable loss of heat through the wall outwardly. The inner one receives the heat from the furnace. Such heat receiving wall section can be provided with blocks, perforated top and bottom at such points as good judgment may indicate, the hot air being carried horizontally as far as may be deemed desirable and then be dismissed into the tier of chambers above, etc., etc. Beneath the window-sills may be small registers to let the heat directly into the room as circumstances may require and to counter-balance any excess of cold sure to be found at such points, while in extreme weather, if needed, other registers, intelligently located, could



be made to discharge the entire heat of the furnace directly into the apartments. It seems reasonable to assume that the latter course would rarely be necessary, and that by such means the walls and windows of a dwelling would no longer need to be avoided and comfort be secured only in proximity to the farthest point of distance from them. We now turn our attention to the consideration of

## —Interior Finish.—

In a previous paper this matter was briefly noted in connection with churches, halls, schools, depots and other structures of a public character. We believe this work is capable of an almost unlimited extension, and that in natural order it will claim a large place in the construction of hotels, offices and business structures, and as its utility, reasonable cost, and beauty of finish are demonstrated, it will find a field even in the construction of our dwellings.

Let us consider its use in office structures as entering into partition walls, leaving ceilings out of the account, for the present. With our present subject in view we made a reasonably accurate computation of the relative superficial area of the outside of a prominent office building in Chicago to that of the inside walls requiring a finished surface, and found the proportion of exterior to interior wall surface to be about as one to six. Our judgment is that this difference is not above the average that will inhere to office buildings, hotels and residences. Hollow fire-proofing blocks for wall linings and par-



titions are already accepted by architects, builders, insurance companies and building inspectors as the very best material to be had for such use, metal and wire lathing and the various plaster blocks being considered a half-way station in the race for

—Fire Proof Construction.—

It will be conceded then without argument, that if it were possible to furnish a clay block that should be of so high a grade as to be acceptable as a finish, that an immense field for the skilled clay worker would be opened up. We believe the production of such blocks is possible, and will as briefly as possible give some reason for our belief.

The question to be answered should be not only can they be produced, but at such a cost as to insure a general acceptance?

First, as to production.—A generation ago had our then prominent brick makers been shown samples of the best dry pressed brick to be found in our market to-day, with their various shadings of color, their perfect form and their perfect surfaces, and been asked if it was practical to furnish such brick at a price that would insure their sale, what kind of an answer, when the general consensus of opinion was averaged up would we have had? Most likely a decided negative, with perhaps an exception lodged by an optimistic few, that sometime, with improved machinery, and by dint of extreme culling for perfect stock, a few men with long purses might be accommodated, but as to a large market for such goods, never! I submit that what has been done in this line, including enameled goods, and also including the fine hand-made terra cotta wares of to-day, as well as the ornamental brick that are employed in our mantels, all furnish evidence that the time should not be far distant in which hollow blocks for interior use of an equal grade of finish should be found competing with plaster successfully.

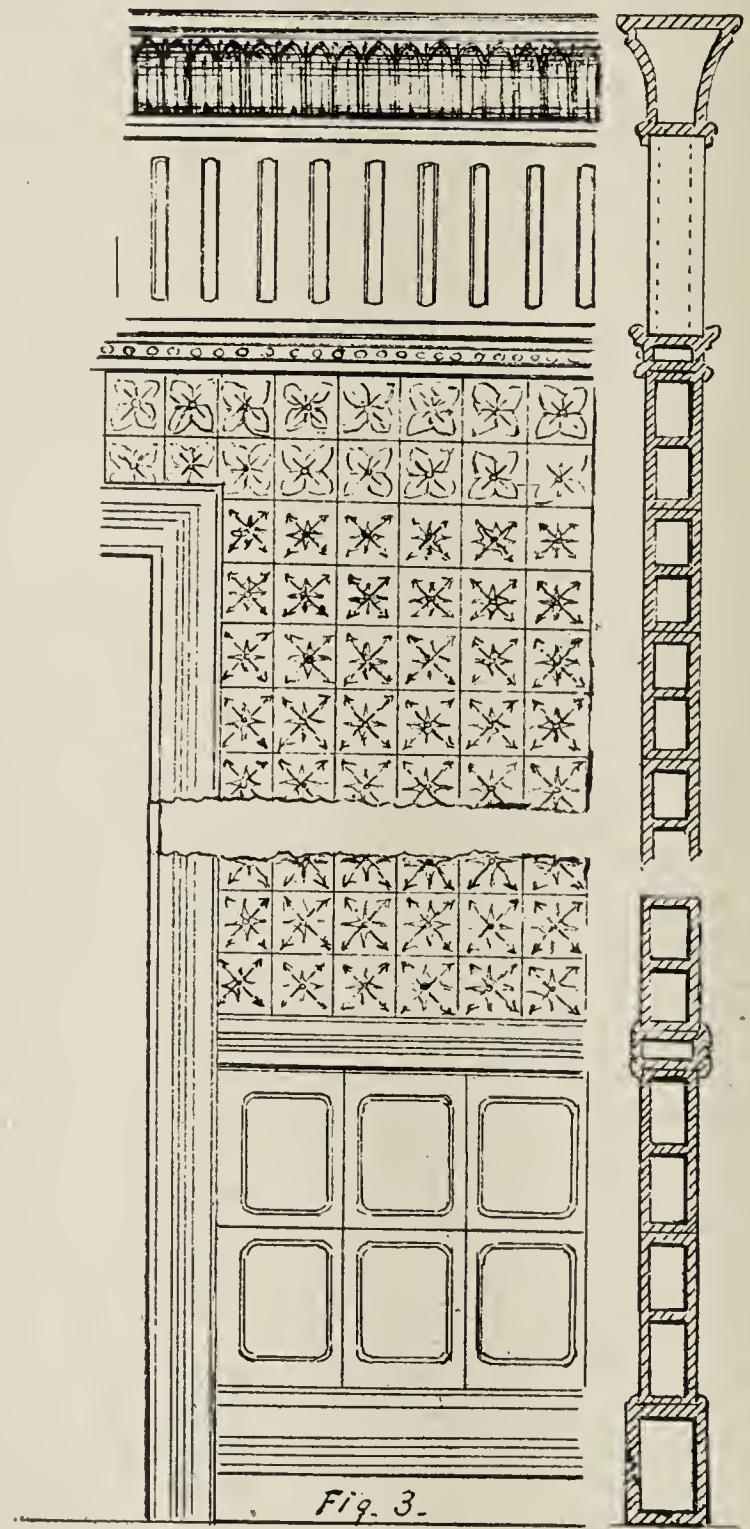
Let it be taken into the account that the hollow fire-proofing blocks in use to-day, are not properly in evidence, in the discussion of this question of finish—they are made for a definite use, and are of a grade to meet the requirements. We have seen the same clay from which these blocks have been made, that have sold as low as \$4.00 per ton in the Chicago market, shipped raw to this city, to appear as ornamental terra cotta goods, worth \$150.00 per ton, the difference being made up of care in preparation, art and skill in moulding and coloring, and care and judgment in burning.

What machinery and skill have done in furnishing a perfect brick, at a price to insure its general acceptance for a large range of work, machinery, art and skill are sure to do in the production of a popular interior finish of hollow clay blocks: first, because such blocks are needed; second, because they may be made to successfully compete with the methods of finish in vogue to-day.

In making our investigation in this line, we have run across several interesting facts, we give one of them as bearing upon both the question of need of an improved material, and the further question of successful competition in price. In the large office building before mentioned, a close calculation showed that a substitution of finished block—saving the application of plastering to their faces—would have also saved the cost of material, and the laying and finishing of over 1,200 tons of plaster, which in itself would go a long way toward paying for the skill and care necessary to produce a finished and finishing interior wall block, the cost of such plastering being fully \$10,000. Another considerable factor would be in the time saved in applying the plaster coat. Assuming that the delay was but thirty days in this case, which seems to be very modest, and no doubt is the rent roll during that period would have amounted to more than \$13,000.

In the interest of a more thorough built fire-proof structure we ask the question, what's to hinder the displacement, the elimination, if you please, of all the wood-work save enough

of a door frame to hang a door, substituting clay casings, base board, chair rail, etc? This again seems to us to be entirely feasible, and we give a little cross-section sketch of a door casing, Fig. 2, showing method of securing the door frame, which need be but about  $1\frac{3}{4}$  x 3 inches, and which may be securely bolted to the casing and wall at one or more of the joints of the block. We also give the vertical cross section of a partition, Fig. 3, being merely a suggestion of treatment, the molded blocks, as well as wall blocks proper, being double faced, and finished by glazing or enameling if called for, such a finish, for such purpose, ought to be a popular one, and we see no reason why they should not, as a rule, be made of considerable length (not less than sixteen inches), breaking joint



with the wall blocks. The recessed features shown in both the casings base board and moulded sections could greatly strengthen the wall, and permit of the use of quite thin blocks. In the sketch, the wainscoting is shown paneled. We should expect to see such blocks produced of a length to complete a panel with a single block.

It may be reasoned that, judging from the current prices of ornamental terra cotta, which are no doubt based upon costs to the producers, it is folly to assume that high grade wares for the purpose required can be marketed at prices that will admit of any considerable use of them, and we need to call attention again to the facts already made plain in former papers, that at least fifty times as many superficial feet of blocks may be produced by machinery as by hand in a given time, that for



all work not demanding bold treatment or undercutting, the machine will do its work as well, if not better, than the hand workman; that the blocks are, when made by machinery, so balanced in their parts (especially so when double-faced) that they will dry and burn straighter than hand-made wares; that the material employed may be as carefully prepared in the one case as the other, and the comparatively light weight of such inside work will cut no small figure in making comparisons.

To this it may be added that the method of imparting the desired finish to the surface as to tint and evenness of color may be accomplished by the methods already referred to in former papers, at a great saving, being done in the one process of machine molding, whereas the hand-made blocks must first be dried partially and then treated by the sponging process, singly. Again, a great difference in cost of treatment after molding lies in the fact that the blocks are transferred from molding machine direct to the cars, which, as fast as loaded are run into the drier, whereas the hand molded blocks, where of an ornamental character, must be treated as individual blocks. The same general statement applies to the burning.

A few words may be added concerning hotels and residences. The protection of human life, and due provision for it in the construction of such buildings is worthy of consideration. We desire to show that it is possible to greatly reduce—we believe by seventy-five per cent.—such risks, without the necessity of resorting to iron or steel beams the fire proofing floor arches. We have in mind the fact that outside of the large cities large and handsome structures for the purposes named, are being multiplied, with no more provision against fire than was made fifty years ago, except, perhaps, the use of wire or metal lathing in place of wood.

The use of fire-proofing in the minds of most being limited to the use of steel or iron beams.

As is well known, the great source of danger in a house in which wood studding is employed for partition, lies in the fact that an immense number of highly inflammable flues, or ducts, have been provided, for quickly carrying any fire once started from basement to attic, with innumerable cross flues at each floor for widest distribution.

Eliminate this factor and much has been done towards security of life and property. The metal and wire lathing is good, but we still have all the fire ducts, and the studding and floor joints to feed the flames. Banish the fire ducts by substituting hollow blocks for wall linings and partitions, and there ceases to be any hidden receptacles or conduits for the destructive agent. There is no reason why hollow block partitions, if requiring no plaster surfaces, should weigh over 1,400 pounds to the square, say a ton to a 10 x 15 foot partition. Such a partition may be built upon two floor joists, one or two truss or stay rods, being introduced connecting floors. Under such circumstances, even without the use of block casings, there ceases to be a connection of combustible material between floor and floor. Only a stairway could carry a fire above the story in which it originated, save as a long continued burning should finally destroy the ceiling plaster and fire the floor above. All will agree that such construction would so circumscribe the ravages of fire, as to almost wipe out the mortality statistics from this source, and reduce by more than one-half fire losses arising from sources internal to the attacked building.

A few words from the standpoint of the manufacturer in answer to questions that may arise in the minds of many as to what per cent. of such stock will naturally find its way into what, under close inspection, would be relegated to second and even culls. The following method of assorting would naturally be adopted:

1st grade. A block perfect as to form and color on both faces.

2d grade. A block perfect on one face—for lining outside wall.

3d grade. Off in color—to be treated with kalsomine paint, or otherwise.

4th. Blocks suited only to receive plastering and to be classed with ordinary fire-proofing, hence no more refuse than would occur in the manufacture of fire-proofing, and probably vastly less, because of more careful handling.

The increasing use of "Lincousta" as sold and applied by wall decorators, suggests the style of ornamentation that could be rendered popular and acceptable. But bolder designs than are possible in these goods, could be had as desired. Columnar and panel effects being produced in any variety required.

In leaving this attractive field I can not but hope that I have been "blazing the way" preliminary to the construction of a

highway over which many skilled clay worker may travel to the desired station known as "success."

A dwelling at Newark Ohio, constructed of ornamented hollow blocks, made by the Empire Clay Company, of Louisville, Ohio, is here introduced. Desiring to learn some facts concerning it, the writer addressed a series of interrogations to Mr. J. H. Newton, the owner, who is the editor of the Newark Advocate and also the Postmaster of Newark, which are here appended with Mr. Newton's answer to them:

J. H. Newton, Esq.:

Dear Sir.—Will you kindly furnish us with dimensions of your residence built of terra cotta blocks (ground plan)?

Answer. 50 x 35. (See drawing.)

Question. Can you still commend it for coolness, warmth and dryness?

Ans. I certainly can. It stands every test.

Ques. Do the walls seem as solid as brick?

Ans. They seem more solid than brick.

Ques. Are the same size of blocks 8x8x16½ inches (one course) used in basement and throughout the building, and is mortar applied directly to the face of the block?



A Residence Built of Hollow Blocks.

Ans. Basement, 8¼x10¼x16½; balance of walls, 8¼x8¼x16½.

Ques. Is the appearance as satisfactory as if of a good grade of pressed brick, and how does it impress the public generally in this regard?

Ans. Appearance far excels pressed brick; all say I have the handsomest house in the city.

It will be proper to add that Mr. Newton is a stranger to me, and the above communication is the only one that has passed between us. The house was built two years or more ago. Window casing, moldings, etc., are all of hollow blocks.

Advices received from Australia indicate that the demand for building material is extensive. In Sydney and Melbourne there are opportunities for disposing of brick machinery quite readily. The number of improvements in public works is creating a demand for contractors' supplies and machinery. In the electrical line the improvements and undertakings are also said to be extensive, and the great bulk of the trade is controlled by British firms, who are said to be sending considerable quantities of American machinery and apparatus.



Written for the CLAY-WORKER.

## BRICK AT THE NATIONAL CAPITAL.



THE PRESENT STATUS of the brick and building business in the District of Columbia shows an increasing depression in these departments of industry. The iron heel of war still treads heavily upon business interest here at the Nation's capital, and no doubt will continue its retarding influence until the American eagle is boss of the belligerent situation. Then, when the white wings of Peace once more hover o'er us the new boom will come, bringing dollars in showers of plenty, and we will again settle down to business with the accustomed vim and "get there" that has put us in the front rank of nations.

From a commercial standpoint the city of Washington could not be considered of great importance; although it has a large number of small manufactories, and its population is ranging up to the 300,000 mark. But in the matter of houses, from the little one-story brick structure, to the big apartment house and palace of the wealth-burdened, the city makes an extensive showing, which speaks well for the brick industry and building enterprise of the District.

But this remarkable effect of the "war scare" upon the building industry here has been growing less as matters progressed toward actual fighting and assured conquest. And although the iron heel of war yet treads to some extent upon our business interests, still there is more confidence and general improvement in the departments of brick and building. And it seems to your correspondent that this is as it should be. Money is comparatively plentiful—for business purposes—and "cheap", at the National Capital, building material can be obtained at moderate figures, and labor is not exorbitant in its demands, so it is a good time to build houses, and to make brick for this purpose. I am informed by the West Brothers that they are having demands for all their brick output; by C. B. Pearson, ex-President of N. B. M. A., that his brick business is at present flourishing, and other makers of brick here are better pleased with their prospects than they were a month ago. During the past few weeks quite a number of brick buildings have been begun, and some important real estate transactions made. Among the former, the apartment house is a conspicuous feature, in fact, this kind of structure is beginning to play a large part in the question of house-keeping economy.

To get a correct idea of the first effect of the present war upon these businesses, your correspondent went to the District government office for facts and figures. Taking the building inspector's statement for the month of March—before the war—it was found that for that month the sum total, represented by building permits issued, was \$907,315, whole cost of buildings; and that for the succeeding month, the time of intense war excitement, the outlay for the same purpose was only \$339,348. Here was a vast difference in the distribution of money, which meant much to the brickmaker and the builder and their employes. Probably the building interests of no other city in the country have suffered in anything like equal proportions.

There is another and perhaps more serious problem than war which confronts the Washington brickmaker. This is that the available clay deposits in and near the District will, in the not so distant future, be worked out. There is a wide clay strata extending southeasterly from Pennsylvania, through Maryland and the District, and ending just across the Potomac river, in Virginia. This deposit seems to cover a great deal of the Capital territory, which for nearly a hundred years has been furnishing clay for buildings, public and private.

Though, as I have said, the city of Washington does not cut much of a figure, as yet, from a manufacturing standpoint, it is certainly "in it" when it comes to the fine residence mansions built for the man of many dollars. The Blaine, Sherman, Leiter buildings and many others are evidences of this fact. The last mentioned of these, with its splendid appointments, fit for the residence of a foreign prince, or an American wheat king, will soon have an elegant neighbor reared at its side. This is to be the Washington residence of Mrs. Postlethwaith, and will when finished, be able to hold up its head (or its roof) with all the dignity that characterizes the mansion that represents an insignificant portion of Mr. Leiter's "pile." The Postlethwaith mansion is to be built principally of gray brick, it will be thirty feet wide, sixty-eight feet deep and four stories high. A unique feature of the house will be the large dining room having, besides a high wainscoting the walls coated with rough plaster and panelled with wood. Five bath rooms

will afford wet comfort for the occupants, and an elevator will dispense with stair climbing as far as the third story.

NICODEMUS.

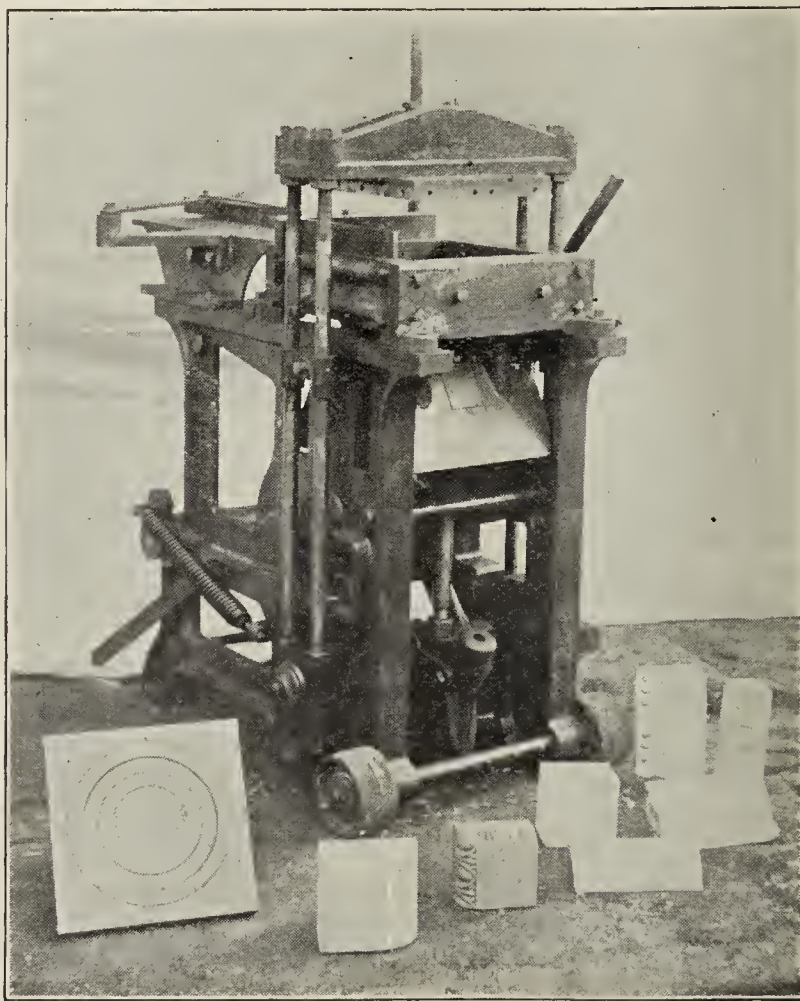
## A NEW HAND-PRESS.

THE OHIO CERAMIC ENGINEERING Co., of Cleveland, Ohio, have recently placed two hand presses on the market, which they state are much superior to anything now in use.

"We do not know everything, but consider that we do know how to build presses," was the remark of the president of the Company.

Below we illustrate one of the presses mentioned, a two-mold hand repress. This press was designed by Mr. G. J. Holl, the manager of the Company, along the lines which have made their steam presses so popular and effective. The capacity of the repress is from 7,000 to 10,000 brick per day for standard sizes, and 5,000 for large blocks, and it will make ornamental and face brick, etc.

Two of these presses were sold from the drawings to Sayre & Fisher Co., Sayreville, N. J., and A. Pritschau, Irondale,



Ohio. The press has sufficient pressure to make two brick at a time, or a block twelve inches square by three inches thick, and works easier than any of the single mold presses now on the market. The following are some of the points of superiority claimed for it:

- 1st. Toggle movement for pressure.
- 2d. Double side bars, indispensable for an even brick.
- 3d. Top die plates enter mold, giving a perfect finish to brick.
- 4th. Bottom die plates drop automatically one-half inch to receive brick.
- 5th. Coil spring to counterbalance weight of plungers, die plates and top crosshead.
- 6th. Top crosshead can be made stationary or to drop forward or backward, as preferred.
- 7th. Mold easy of access from all sides, and press easily adjusted and simple in construction.
- 8th. Hand discharger to remove brick from mold without handling and defacing them, and without upsetting large blocks.

The press is sold under a strong guarantee.

Later we will publish illustration of hand press for ornamental dry press brick, recently built by them for The Ohio Mining & Manufacturing Co., of Shawnee, Ohio.





THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

### Words of Cheer and Sympathy.

Editor Clay-Worker:

Be it known that the joy evinced by the brethren over the recovery of our dear Brother Gates is not confined to those who enjoy the privilege of a personal acquaintance with him. Many who have never seen the author of "Button-hole Talks" claim to know and to have a large interest in him. His kind, helpful, sincere words and generous deeds proclaim the man. "They smack of honor both."

I am, dear Mr. Editor, as always, yours faithfully and sincerely,

R. M. GREER.

Tuxpam, Mex., June 8, 1898.

P. S.—I am sure there is not one reader of the Clay-Worker who does not deeply sympathize with brother McCain in his sore hour of trial, and pray that he may have a successful and speedy issue from it.

### Clay Products at the Great Omaha Exposition.

—The Local Brethren Promise To Extend The Glad Hand To Visiting Brickmakers.—

Editor Clay-Worker:

In response to your request I made a special trip to the Exposition to investigate the exhibits of clay products.

I find a number of interesting displays in the Mines and Mining Building. The largest collection of brick is furnished by the Hydraulic Press Brick Co., of St. Louis, Kansas City and Omaha. Their exhibits include all kinds and shades of pressed brick laid in different colored mortar, making a very nice display and showing the effect in a very creditable manner, such as a brickmaker admires.

The States of Missouri and Oregon show a small collection of common and press brick. Montana has a collection of fire brick. The Salt Lake Press Brick Co. has a collection of press brick very neatly arranged, making a nice display. The Enterprise Clay Co., of Ogden, Utah, has a display of sewer pipe. Atchison and Topeka, Kansas, show very good samples of paving brick. I am sorry to say that Nebraska has no display. We tried hard with our Commissioners to get an exhibit of Nebraska clay products, but it seems they turned over everything to the farming industries, and the \$100,000 furnished by the State, went almost entirely to the "poor" farmer or his industries. But that is the usual way of doing things out here. However I hope to see the day when our clay industries are shown up, as we have vast deposits of clay in our State, that no one knows of or what can be made out of it. For sidewalk paving we will be able to give a good sample. The main court of the Exposition is paved with brick, making acres of brick pavements. This court is one of the finest sights any one ever looked at, when it is all lighted up with thousands of electric lights, showing the white city in a most beautiful manner. The Lagoon with its splendid boat riding should not be overlooked. No brickmaker should miss this wonderful show.

Last of all, but not least, are the streets of all the nations and Cairo. These streets are paved with brick, so a brick man can feel right at home in these places of amusements. I do not think that very many brick men have attended the show yet, if so, I have not seen them and we don't think brick men are coming to Omaha unless they visit our yards, at any rate I hope not. Will gladly welcome every brother brickmaker who comes this way.

Brickmaking in Omaha is dull just now, most all the yards have closed for the present. Three months ago, there was not a brick for sale, but to-day they are on the market from five to seven million. Prices are from \$5.00 to \$5.50 per 1,000. Three to six months ago the same quality sold for \$8.00 to \$8.50, and all the yards in Omaha, South Omaha and Council Bluffs,

started early last spring, but after we all had a kiln or two burned, the prices dropped and we are all wondering how much lower brick will be. Supply and demand make prices with us. We have no established price, each one makes prices to suit himself.

Hoping that I may see you and many clay workers here this summer, I am,

Yours truly,

Omaha, Neb., July 12.

J. FRED SMITH.

### No Bonus for New Brick Yard.

Publishers Clay-Worker:

I note in the last issue of the Clay-Worker that you say that "J. B. Rockwell and C. H. Forey, of Lexington, Ky., are contemplating the advisability of moving their brick plant to Parkersburg, W. Va. The people of Parkersburg will offer \$20,000 bonus."

Please say in your next issue for me that I don't think that the people want to give anybody \$20,000 to start a brick plant, but if they do they don't have to go outside the city to get such an offer accepted, because I will put my \$12,000 plant in and with the addition of \$20,000 cash I can turn out a better product than strangers can that have never worked this clay. The fact of the matter is that these parties wanted to put up \$8,000 and asked the Board of Trade to raise the other \$12,000. We can make fancy brick if the citizens want to furnish us the money to do it with less trouble than some outsiders.

Yours truly,

Parkersburg, W. Va., June 20, 1898.

CHAS. B. EBERT.

### Brickmaking in North Dakota.

Editor Clay-Worker:

It may be interesting to some of the many readers of the Clay-Worker to know something of what the brickmakers are doing here in the northwest. So I will try and give you a brief description of some of the yards in this section. Grand Forks, N. D., is a city of about 9,000 population and supports four good yards. A great many readers, no doubt, think of the "wild west" as being built of wood or canvass buildings, but not so with Grand Forks, which has business buildings of brick and stone which will compare favorably with the older cities in the East. The streets are paved with cedar block. This is surprising, as "Jack Dinnie," the mayor of the city, is the principal brick manufacturer, and it seems to a brickmaker that a brickmaker-mayor ought to see to it that the streets of his city are paved with brick. As a brickmaker Mayor Dinnie is a howling success. He makes 35,000 brick per day, and I don't believe there is a yard in the country that will make this number of brick for as little money as he does. The only fault one could find with our friend Dinnie is, that as mayor of Grand Forks, he did not see to it and have the streets of this thriving city paved with brick instead of cedar block. When I called his attention to this, his answer was, that if wheat would only stay at \$1.00, they would pave them with gold this fall.

His yard is located about two and a half miles from the city, it is complete in every respect; he has a twenty horse power engine and boiler, a Potts Horizontal Stock Brick Machine, and mold sander, all of which he commends very highly. Surely the brick made at the time of my visit were as nice as I ever saw. They were square and hard, clean sharp corners, and smooth surfaces. The brick are dried in racks, burned in cased kilns with wood. The clay is light and easy to work. The bank is about seven feet deep, and as is the case with all clays in this country, it burns white. The clay is taken from the bank to the machine by horse carts, three, moving clay for 35,000 brick; one of Mr. Dinnie's economical ways is that, he has the horses trained to go back and forth without a driver, making a saving of three to four dollars per day.

The East Grand Forks Brick Co., the yard located in East Grand Forks just across the Red River. They make 35,000 brick per day. On this yard they use an Otto Gas Engine for power, this without a doubt, is a great saving, as it requires no engineer and the fuel to run a Potts Horizontal Machine and sander costs \$1.25 per day. It is a wonder to me that more small yards have not adopted this power, it is cheap. The clay is about the same as found on all yards in this section. They haul from bank by horse and cart, dumping directly into brick machine, dry in racks, burn in cased kilns with wood. When burned the brick are white and are good and strong when properly burned. East Grand Forks is a thriving suburb, it is in the State of Minn. Grand Forks is in N. Dak., a prohibi-



tion State; about the first three blocks after crossing the river into East Grand Forks are the wettest three blocks in the land, every door leading to a bar.

The Alsip Brick Co. and J. Bartholomew have yards similar to those described excepting Alsip uses a Quaker and Bartholomew a Monarch Machine. While none of these manufacturers are members of the N. B. M. A., they all take the Clay-Worker, and are well posted in the proceedings of our conventions. They have a local organization which works well, each manufacturer selling all his brick to the Red River Valley Brick Co. No brick are sold at the yards, all going through one office. They are selling brick at \$7.50 to \$8.50 per 1,000.

Spring business opened up brisk and they sold all the winter stock at the prices named before they could make new brick. This is a prosperous community and visiting brick-makers will be made welcome at all times. S. T. Paul.

### The Tile Trade Improving.

Publishers Clay-Worker:

Enclosed you will find my renewal subscription. Though running but a small brick and tile plant, can hardly do without the Clay-Worker. The brick and tile trade here has been very dull all spring. Good prospects for fall for tile, but not many brick are used here. Brick sell for \$5.00 and \$6.00 per thousand. Been some cutting in the price of tile: 4-inch, 22 cents; 5-inch, 34 cents; 6-inch 50 cents; 7-inch, 65 cents; 8-inch, 76 cents; 10-inch, \$1.00; 12-inch, \$1.50 per rod. I made one mistake when I first started. The land was mortgaged and the move cost me several hundred dollars, and I find the brick clay where I am now is very tender, but it works all right for tile. Just built a down draft kiln and burned twice with good results. Wishing the Clay-Worker much success, I am,

Yours truly,

Gallatin Co., Ill., 7-1-'98.

H. C. M.

### The "Ifs" of the Roofing Tile Business.

Editor Clay-Worker.

I noticed in a recent issue of the Clay-Worker a brief letter from the Standard Tile Co., in which there was reference to roofing tile manufacture that may influence unfavorably some one meditating engaging in that business. The paragraph referred to reads as follows:

"As for our business, we long to meet some of those enthusiasts who paint such glowing pictures of the roofing tile business. We should like to play rugby football with them to the dirge that breakage, checking, warping and flashing does with our illusive profits. The roofing tile business is satisfactory if—but what a gigantic if—we could get out 100 per cent. yield, but with the dump growing faster with scrap tile than the stock pile, we are anxiously looking for some tenderfoot who has not yet been shorn by the enthusiastic patentee or alluring machine man."

Your correspondent complains of loss from breakage, checking, warping, etc., to the extent of more than half their output, but do not give any details which might enable any one desirous of helping them, to locate the trouble. They long, however, "to play Rugby football over it with some enthusiast, they of course, very properly under the circumstances, taking the role of the football. This, possibly, would prove beneficial, though less heroic treatment might be tried. If the breakage, etc., occurs in the drying, proper care having been taken, it is pretty evident that the clay is not suitable, in which case it ought either to be changed, or mixed till fit. It may be necessary to mix some brains with it. If the local supply of this article is exhausted, probably some of the roofing tile experts who occasionally offer their services in the Clay-Worker, could supply the deficit.

If the clay has behaved well in the drying, it is likely to do so also in the burning, otherwise it probably either contains an excess of some injurious element, such as lime, etc., or has been subjected to unskillful burning, too rapid watersmoking, drafts of cold air, admitted during the burning, or not sufficient time allowed for cooling. Your correspondents should read what my valued friend and countryman brother Waplington has to say on this subject, on page 427, May issue of the Clay-Worker. Those who, like our good friend and counselor, brother Morrison, "follow this able writer whither soever he goeth," will find that it means money in their pockets at the close of the season.

Your correspondent's reference to "the enthusiastic patentee or alluring machine man," though serving admirably to round off the closing sentence of their letter, falls altogether

wide of the mark, so far as the facts of the case are concerned. These indispensable helps to the progressive clayworker play a comparatively small part in the business of roofing tile as a side issue. A few inexpensive hand presses is all the extra machinery required, while the patentee, so far as the roofing tile is concerned, does not appear at all. There are many excellent forms of roofing tile in almost universal use in the old countries, on which there is, and can be no patent. In fact, in the writer's opinion, there can be no valid patent on a roofing tile, every possible failure of which has been in practical use from time immemorial.

Although at first sight, apparently discouraging to the intending roofing tile manufacturer, your correspondent's letter ought to be, in reality, just the reverse. If they, losing more than half their output, "the dump growing faster with scrap tile than the stock pile," can afford to still continue in the business, what would be the result IF—and that a diminutive if—they were to get, not the impossible 100 per cent. yield they mention, but say a modest ninety per cent., which any clay worker of ordinary intelligence should easily be able to do, if they will only take care. I wish to emphasize this point, take a little more care at every stage of the process of manufacture.

Tuxpam, Mexico, June 27, 1898.

R. M. GREER.

### From the Ashes.

Phillips & McLaren, Pittsburg, Pa., write that they have rebuilt their plant, which was entirely destroyed by fire April 6th, and now with new and better facilities than ever before, they are in position to fill promptly any and all orders for dry pans and other heavy machinery that may be entrusted to them. Their new foundry and machine shop is 80 by 264 feet, is built entirely of steel and equipped throughout with up-to-date appliances. They desire to make public expression of their appreciation of the kindly forbearance of their patrons while they were rebuilding. Delay in filling orders was unavoidable under the circumstances. There will be no occasion for complaint on this score from now on as they have improved their facilities materially, and will be pleased to hear from their old patrons and as well from any of the clay-working craft who want improved clay crushing machinery.

### WORKING NIGHTS.

Thanks to a New Cutting Table and the Clay-Worker.



Frankfort, Ind. 7-14-98.

Publishers Clay-Worker:-

In response to your inquiry as to trade conditions, I am glad to say that our business up to date is better this year than it has been for several years past. At the present time we are running nights on orders, something that has not occurred before since 1895. The inquiries for our new Automatic Cutting table are numerous, and coming from all directions, affords us new evidence of the wide circulation of the Clay-Worker, for we have not advertised the Table in any other paper. In the past thirty days, we have sold seven of these cutting tables. Those in operation are working with marked success. So far there has not been a single complaint or criticism, which is rather remarkable considering that the table is new.

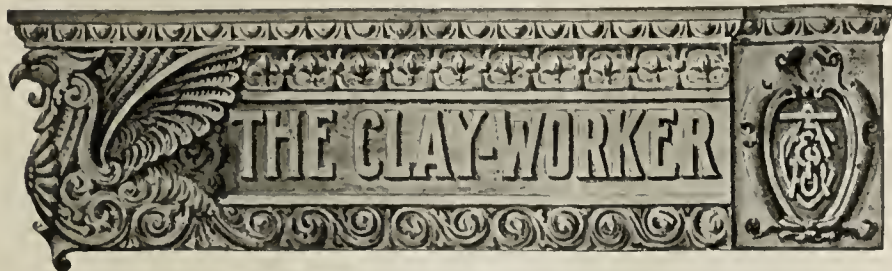
Yours Very Truly,

L. D.

THE WALLACE MFG. CO.

*W. R. Cunningham* Secty.





Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to  
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

Vol. XXX.

JULY, 1898.

No 1.

CURRENT COMMENT.

As we go to press, comes the good news of the surrender of Santiago. This we sincerely hope is the beginning of the end and that ere long we may be again known to the world as a nation of peace—not "peace at any price," but peace born of justice, peace rightfully due a nation of freemen who, respecting the rights of others, command respect for themselves.

\* \* \*

The effects of the war with Spain is felt directly by almost every individual citizen. The Clay-Worker is forcibly reminded of this by the return of papers addressed to our subscribers in the Philippine Islands with the government stamp upon the wrapper, "Return to sender. Dispatch to Spain or colonies prohibited on account of war." In a little while, "when the cruel war is over," we will reforward the papers returned.

\* \* \*

It may be news to most of our readers, for we have never exploited the fact, but there are few civilized nations on the globe among whom we do not number a few subscribers. In its fifteen years of usefulness, the Clay-Worker has gained friends in nearly every quarter of the globe. Few trade journals, even among those representing larger and maybe wealthier constituencies, are circulated so widely. There is a common interest among clay workers of every tongue that makes the Clay-Worker a welcome visitor everywhere.

\* \* \*

Familiarity breeds contempt. As we grow accustomed to war, we find it is not so inimical to trade as we first feared. Spain is no longer in a position to interfere with our commerce or coast cities. There are no longer reasons why investments should hinge on the question of the war. In fact, there has been less of this all along than some of us imagine. There are those who are constantly seeking excuses for in-

activity. War is a very good excuse. There has been as much loss through talking war as there has been through the actual depression because of the existence of war. This is being better understood and appreciated, and consequently business is improving. Some days ago, even before the destruction of Cervera's fleet, a loan of \$100,000 at 4 per cent. was granted on a building enterprise in this city.

\* \* \*

Our able City Engineer, Mr. B. J. T. Jeup, has hit upon a good way to improve our asphalt pavements, by making them in part of brick, as recounted on page 18. We are confident this combination will prove much more satisfactory than any asphalt pavements heretofore laid on our streets.

\* \* \*

Our friend and contributor, Heinrich Ries, of New York, who has gained distinction as a geologist and specialist in clays, having rendered valuable assistance to the Department of Geology in his own State, and later performed similar service for the State of North Carolina, is now connected with the Geological Survey of Alabama, and writes that the results thus far obtained indicate that the clay deposits of Alabama are extensive and include valuable deposits of good kaolin and flint clays.

\* \* \*

A prosperous Yankee commonwealth is Massachusetts. Mr. Dunn, in a letter from Worcester, Mass., brings out some facts in relation to clayworking in the commonwealth, which are both interesting and amusing. If Massachusetts could make brick out of its history, what great brick they would be. If she could make brick out of Plymouth Rock, what great brick they would be. But this grand old commonwealth has made history in other lines of work, and she may yet do the same in brick. She has been a little slow hitherto, but through that spirit of thoroughness which is sometimes mistaken for slowness, there can be in the future yet a higher development than has heretofore been realized.

BUSINESS STRAWS.

Not because of the war, but in spite of it, all lines of business are prosperous. A more fruitful year has seldom been known, so far as the crops have matured, and have been harvested. If corn and other late crops prove as good as they now promise, the railroads will have all they can do to move the product of the country. Prices remain remunerative and foreign demand keeps well up. Our exports have been nearly double any former year and our imports so much less than exports that gold has been freely imported to balance accounts, so that the silver question that at one time seemed to trouble some people has been almost forgotten. Much of this prosperity is, of course, attributed to our good crops, but these are largely owing to the patient industry of the people, making due allowance for favorable seasons. The Clay-Worker's mid-winter prediction of a prosperous business season seems likely to be more than realized.

CHEAP LABOR OFTEN MEANS DEAR LABOR.

The Clay-Worker is not an advocate of cheap labor anywhere. Cheap goods and a crowded market may sometimes enforce cheap labor, but there are some things in which cheap labor is too dear for use. So many calamities have happened recently through unskillful management of steam engines, by cheap men, that the popular voice should be heard in protest against jeopardizing life and property by committing the management of such machinery to men who are not thoroughly trained in the business. While no possible combination can arbitrarily fix the price of labor in any department any more than it can permanently fix the price of the products of labor, yet within bounds it is proper that skilled labor should demand better wages in its department than unskilled, but no



one is at liberty to put life and property at peril by employing unskilled labor because it is cheap. And, after all, is not the attempt to force the price of labor above its real value when measured by other values, a great wrong upon the best laborers? The result is, it levels down instead of leveling up. Special compensation for superior skill is seldom known now, in any community where wages are fixed by combinations. While combinations may help laggards to better wages, it robs the deserving of their just rewards. Cheap labor is oftentimes the dearest in the end.

### BRICK PAVEMENTS GROWING IN FAVOR.

As our readers may see by the illustrated article in this issue entitled "Brick and Asphalt Pavements," brick are being used in connection with asphalt in Indianapolis. Washington Street is the principal thoroughfare. Two lines of heavily travelled street car tracks run its entire length and the gutters are filled during all of the hours of daylight with vehicles. Asphalt has never done well next to or between street car tracks in this city and gutters have been first to fail where that material is used. This new pavement has brick between and adjacent to the street car tracks and in the gutters, leaving the asphalt for the intervening space. We feel justified in claiming that this a decided verdict in favor of brick pavement and are disposed to take this as great credit to brick as a paving material.

We note that brick is coming to be used adjacent to the hydrants on asphalt streets where sprinkling carts draw their supply. There being at such points a constant amount of moisture from leakage, the asphalt fails and brick is now used to take its place. We noticed an instance of this kind recently on a relatively new asphalt pavement. Surrounding this hydrant the asphalt had been cut and replaced with brick. Now if brick is good enough to stand the brunt of the wear on a street where a certain proportion of the surface is covered with asphalt, isn't it good for the entire street. We speak of brick in its relation to asphalt because we are quite certain that the only competing material in the minds of the public which brick has is the so-called asphalt covering. We are also quite certain that asphalt pavement cannot be counted a success as a paving material on the grounds of its physical endurance, but it is a success largely on account of the fact that it has a brainy contingent back of it which is always on the ground to apologize for its failures and proclaim its strength, always claiming that the next pavement will prove better and more durable.

### THE CLAYS OF INDIANA.

The State Geologist of Indiana, Mr. W. S. Blatchley, has published the twenty-second annual report of his department, which contains a deal of interesting matter on the clays of the Hoosier State, as our readers may judge from the extract published on a preceding page of this issue.

Mr. Blatchley belongs to the class of practical geologists, among whom may be numbered Cox and Collett, who have done so much for the material interests of Indiana. Prof. Cox was instrumental in developing and calling to the attention of the world the coal fields of Indiana. He analyzed the coal from the standpoint of its practical uses, determined its qualities, and in an untiring manner presented this information to the world about him.

As a direct and immediate result of his work two lines of railroads were built into the coal fields and Indiana coal was made famous in this part of the country. This work, be it understood, was not done by mere analysis or the publication of a report. It was done by personal addresses, public appeals, newspaper interviews, articles in magazines and energetic day and night work.

So with Prof. Collett; he took up the stone industries, and now, as the direct result of his efforts, it is known all over the United States, that the largest quantities of the best building

stone are to be found in Indiana. Large quantities of it go to New York, Boston, Philadelphia and many other remote markets.

As great an interest as either of these, possibly greater from a material standpoint, is the clay industry of Indiana in which Mr. Blatchley is taking a direct personal and practical interest. At the same time he is carrying along the work of his worthy predecessors. We commend Mr. Blatchley's report to our readers, and to other States we commend the character of work which has been done by our geologists. As said before, it has consisted of something more than the preparation of volumes to become musty. It has attacked practical and material things in a practical and material way. It is fortunate for the clayworkers of Indiana that Mr. Blatchley has taken up so earnestly the work of developing the clay resources of our State.

### NOISE OF PAVEMENTS.

There has been always more or less talk about the noise made by riding and driving over different kinds of pavements, and comparative statements of differences have been made. As a matter of fact, all pavements are noisy. The relative difference is not great. The noise is largely a matter of the character of traffic. Among modern pavements, granite block which under heavy traffic soon comes to have rounded surfaces, is the noisiest. Yet few think of granite pavements being particularly noisy where only horses and buggies pass over it. Macadam has the reputation of being the least noisy, yet macadam is only used on streets and roads where driving is light. Now that we have rubber-tired vehicles the chief element of noise is the clatter of the horses' feet, and this is about the same on all pavements. So, all in all, the noise feature is not serious or of much moment.

### FIRE LIMITS.

The city of Boston is now seeking to extend its fire limits into its suburbs and thus altogether do away with frame structures. This matter has been under discussion for some time. People are being educated on the subject. While it now appears there will be some compromises, yet the main issue will be met, and a great advance made. In many of our cities even where the law prescribes brick for the external walls the buildings are little better than frame on account of the immense quantities of wood used on the interior. For instance, we have in mind structures with outside walls of brick and none but stud partitions on the interior. A building of this kind once on fire is almost sure to be destroyed.

### BRICK PAVEMENTS IN CHICAGO.

Brick paving material is receiving much attention in Chicago. During recent years much of it has been laid and now we find that it is a favored material. Chicago cares for its streets badly after they are laid, and it is well known that it requires the most favorable of conditions to establish even a fair success through the use of asphalt. Not so with brick. Water, fire, hard use and general neglect have little effect on this material. Brick pavement will stand more abuse than any other paving substance, hence it is the best material for streets that are not watched, cleaned and repaired constantly. For the same reason it is the best pavement for small towns.

### SLOW BURNING CONSTRUCTION.

While the difference in cost of fire-proof and slow burning construction is not so great as it once was, it is yet sufficiently great to lead us to study this question through such articles as appear in this number of our journal by Mr. Loring, as well as through other sources. It is well to bear in mind that one of the greatest insurance organizations in this country has de-



veloped a phenomenal success through its attention to slow burning construction. Specially hazardous industries such as cotton and woollen mills, largely through the medium of slow burning construction have been able to reduce their insurance to less than one-fifth of one per cent. per annum. We commend this subject to our readers.

### CLAYS AND CLAYWORKING INDUSTRY OF NORTH CAROLINA.

THE NORTH CAROLINA Geological Survey, J. A. Holmes, State Geologist, has recently issued a report on its clay resources. The report is written by Dr. Heinrich Ries, and in addition to a discussion on the location and extent of the kaolin and other clay deposits of the State, gives the chemical and physical qualities of a number of them, setting forth their degree of refractoriness, shrinkage and color in burning, plasticity, etc.

In the case of the higher grades of clay, the kaolins, rational analysis are also given, showing the amount of clay substance, quartz and feldspar which the clay contains. This gives the porcelain and white earthen ware manufacturers an important clue in the mixing of their body, and while it has been much used abroad, has received comparatively little attention in this country.

The report describes kaolins, fire clays, stone ware, pipe and brick clays, and several chapters are devoted to the properties of clays in general. It also contains a number of illustrations, and bibliography, giving a list of works on clays, of interest and value to the practical clayworker.

The report can be obtained on application to Prof. J. A. Holmes, State Geologist, Chapel Hill, N. C.

## TABLE OF CONTENTS.

|                                                                |    |                                                             |    |
|----------------------------------------------------------------|----|-------------------------------------------------------------|----|
| Clayworking in Turkey .....                                    | 9  | The Tile Trade Improving .....                              | 46 |
| Artificial Pottery Bodies.....                                 | 10 | The Ifs of the Roofing Tile Busi-<br>ness.....              | 46 |
| Button-Hole Talks.....                                         | 12 | The New York Market.....                                    | 50 |
| The Clays and Clay Industries<br>of Northwestern Indiana ....  | 13 | St. Louis Notes .....                                       | 50 |
| Anglo-American Pottery.....                                    | 15 | Notes by the Way.....                                       | 54 |
| A Brick Factory in a Wooden<br>Town .....                      | 16 | Pacific Coast News .....                                    | 56 |
| Brick and Asphalt Pavements.                                   | 18 | <b>EDITORIAL:</b>                                           |    |
| Brick vs. Asphalt in Small<br>Cities .....                     | 20 | Current Comment.....                                        | 47 |
| Wages and Prices.....                                          | 22 | Business Straws.....                                        | 47 |
| The McAvoy Vitrified Brick Co                                  | 23 | Cheap Labor often Means Dear<br>Labor.....                  | 47 |
| Modern American Front Brick                                    | 24 | Brick Pavements Growing in<br>Favor.....                    | 48 |
| The Burning Question.....                                      | 26 | The Clays of Indiana .....                                  | 48 |
| Fire Resisting Materials and<br>their Use in Construction, etc | 27 | Noise of Pavements.....                                     | 48 |
| Brickyard Sketches—Indiana's<br>Baby Brickyard .....           | 29 | Fire Limits .....                                           | 48 |
| A Prosperous Yankee Com-<br>munity.....                        | 31 | Brick Pavements in Chicago ..                               | 48 |
| The Development of Hollow<br>Block Manufacture .....           | 33 | Slow Burning Construction....                               | 48 |
| A New Hand-Press.....                                          | 41 | Clays and Clayworking Indus-<br>try of North Carolina ..... | 49 |
| <b>CORRESPONDENCE:</b>                                         |    | Editorial Notes and Clippings .                             | 52 |
| Down in Jersey.....                                            | 30 | <b>MISCELLANY:</b>                                          |    |
| Brick at National Capital.....                                 | 41 | Results of Overwork.....                                    | 44 |
| Words of Cheer and Sympathy                                    | 45 | Binding Effect of Retaining<br>Statement of Account.....    | 47 |
| Clay Products at the Great<br>Omaha Exposition.....            | 45 | From the Ashes.....                                         | 46 |
| No Bonus for new Brick Yard..                                  | 45 | Working Nights.....                                         | 46 |
| Brickmaking in North Dakota.                                   | 45 | Old Glory .....                                             | 49 |
|                                                                |    | Selecting Drain Tile .....                                  | 58 |

Index to Advertisements on Inside Cover Page.

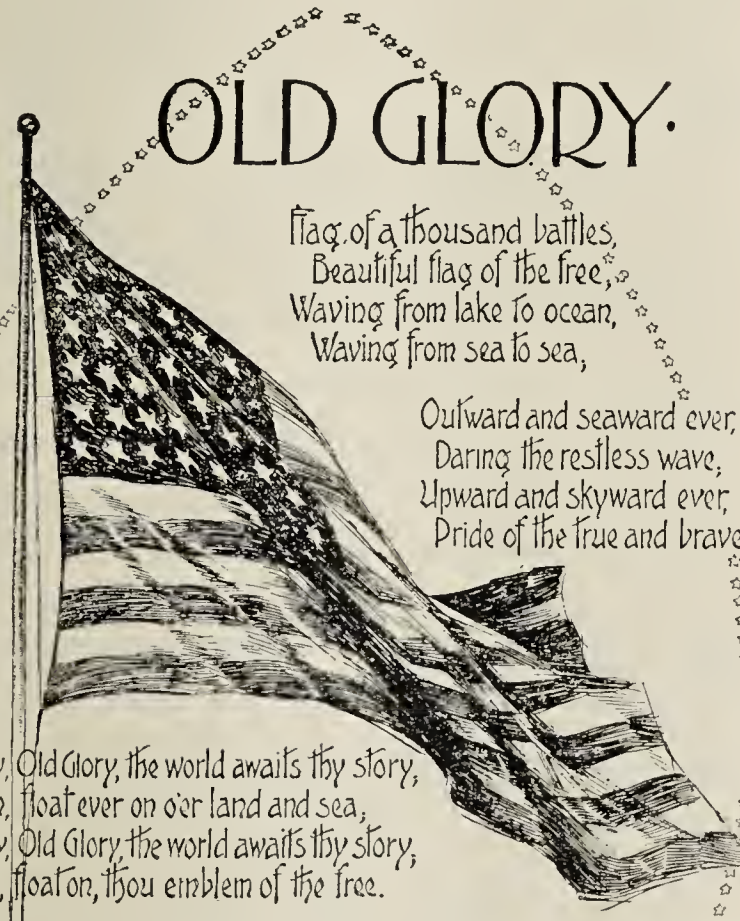
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N. D. FRASER,  
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- "CLAY GLAZES AND ENAMELS,"  
Henry R. Griffen, C. E. \$ 5.00
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Morrison and Reep, 3.00
- "BRICKMAKING AND BURNING,"  
J. W. Crary, Sr., 2.50
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Indianapolis, Ind.



**OLD GLORY.**

Flag of a thousand battles,  
Beautiful flag of the free,  
Waving from lake to ocean,  
Waving from sea to sea,

Outward and seaward ever,  
Daring the restless wave,  
Upward and skyward ever,  
Pride of the true and brave.

Old Glory, Old Glory, the world awaits thy story,  
Float on, float ever on o'er land and sea,  
Old Glory, Old Glory, the world awaits thy story,  
Float on, float on, thou emblem of the free.

Flag of a thousand battles,  
Cresting the billows of fire,  
Whelming established evils,  
Raising the lowly higher;

Challenging ancient error,  
Silencing tyranny dumb,  
Gladdening and inspiring  
Hope for the years to come!

Old Glory, Old Glory, the world awaits thy story,  
Float on, float ever on o'er land and sea,  
Old Glory, Old Glory, the world awaits thy story,  
Float on, float on, thou emblem of the free.

— IRONQUILL.  
IN ST. LOUIS GLOBE.



## THE NEW YORK MARKET.

IT IS A relief to be able to say something favorable about the market, as the year past has been about in the condition of the college boy's blessing. Each boy was called on to ask divine blessing on the food, one of them had always refused, this day he expressed the wish to ask the blessing, which he did in this form: "Dumplings rough, dumplings tough, glory to God we have all had enough." So in the brick trade of low rates. The high rate could not be expected to continue, but as long as the slump was slight one could not complain. June has done well as regards weather and brick has been turned out without being washed or even spattered. The stock in the first kilns made the previous month were about all washed and this month the market has been filled with that class of stock, with corresponding scarcity of smooth, they have held well up and the poor grades were sustained and sold for good rates. If a year ago the same stock had been placed; well, the agent would be afraid to see the manufacturer for fear he would scalp him for giving his stock away. No complaints are heard this season, the drop has been gradual. The first few days in June showed no change in price. The first week top, \$6.50, washed, \$5.50; the second week \$5.50 and \$5.75, with select a trifle higher. The third with \$5.50 and \$6.00 and Jersey \$5.50 and \$5.75, pale \$3.50 and \$3.75. Who can say a word when there is money in sight in these quotations to celebrate the Fourth.

## —This Year's Strike.—

It is getting tiresome to have to report a strike in some branch of the building or brick trade which will work an injury—this one is different and might have been a benefit to all who make brick if carried out as first intended. The men on the yards at Haverstraw, singular to relate, asked the manufacturers to put out only 20,000 to a pit, and not as now, 21,000, 22,000 or 23,000, as they have room on yard. Not more money. There is nothing unreasonable in the demand and it would accomplish in a degree what the brick men have been trying to get the different manufacturers to do, curtail production. Say the average reduction on each one of the forty odd yards was 5,000 per day, it would help, as in all likelihood the reduction would extend to all the Hudson River yards. It would make quite a number during the season. The men had an agreement drawn up and eleven signed it and were making brick while the others were idle. The strikers acted more like a rabble than an organized body.

The strike was not on many days till affairs assumed a different phase. The original demand of 20,000 to the pit and no more was supplemented with a demand for 10 per cent. advance in wages. If not granted "will form a union, with walking delegate," they said. There are only two yards working. Nothing has been loaded from there for the New York market since the 15th of last month. On that day three boats were loaded and went to New York with 120,000, 160,000 and 200,000 respectively, their capacity each 300,000. A cargo of coal dust was at the dock at the time and a few days after sprung a leak. The brickmaker wanted the men to discharge the cargo to save expense to owner of boat, but was met with an emphatic "no." They would not let any one work on her. The agent for the dust succeeded in selling the load to one of the two yards which had agreed to the terms of the strikers. All the rest of the manufacturers are unanimous in fighting to the end. The rest of the manufacturers along the Hudson at a meeting held a few days ago, thought that as the strike had been a decided benefit to all others on tide water and was a financial loss to the Haverstraw men, that there should be a circular sent to each, asking that they contribute 2 per cent. on the basis of what they made last season, which would call for \$100 from a yard which made 5,000,000. No doubt it is a hardship on many and the help from that fund will be a benefit, aside from that all other manufacturers along the Hudson and New Jersey well know that if the men succeed in this movement, all other yards will be in the same boat. There was a strike on the Washburn Bros. yard, at Glasco, N. Y., among the Italian laborers. They called on the sheriff for help. The men were very ugly, drawing knives on the men. With the help of the sheriff, men and captains of the barges, who watched the plant day and night to protect it from fire, they finally gave in.

## —Record Breaker.—

The voluntary retirement of Mr. Philip Orth, foreman for Mr. Edwin Schmults, after a continuous service of over thirty years for father and son is probably without a parallel in the trade. There are not many men of his stamp in the charge of yards. He is forced to give up at the age of seventy-one, not of

ill health, but because he is not content to oversee, but must work. Mr. Schmults tells me that when he has spoken to Mr. Orth about hiring an extra man or two and take it easy, the reply would be, "does it pay?" What could he say to that

## —A Change.—

Of foreman on Mr. Gillies' yard to a thoroughly up-to-date man has been a very satisfactory one. An utter stranger to the stuff, and the brick was made during the wet weather of May, he has in his first kiln, done vastly superior work to his predecessor.

A. N. OLDTIMER.

Hackensack, July 2nd, 1898.

## ST. LOUIS NOTES.

THERE HAS BEEN no change in prices of common brick since last month, when they dropped one dollar per thousand over night. The Hydraulic Press Brick Co. secured eighty per cent of the orders on the cut price, and contractors and owners reaped a benefit of about \$20,000. The estimated orders in sight was 20,000,000.

The alleged reason for the cut was on account of a little yard in South St. Louis selling 300,000 brick at 50 cents per M below the then market price.

A little problem—Brick yard S. St. Louis worth \$7,000 makes cut price—20,000,000 brick in market.

|                                          |             |
|------------------------------------------|-------------|
| 20,000,000 at a cut of \$1.00 per M..... | \$20,000.00 |
| If all other brick yards had contributed |             |
| their pro rata and bought brick yard at  | 7,000.00    |

|                           |             |
|---------------------------|-------------|
| They would have made..... | \$13,000.00 |
|---------------------------|-------------|

And had a yard on hand to dismantle, operate or sell.

The proprietor of one yard centrally and favorably located says he can draw a circle within a given radius around his yard and deliver brick for \$3.75 and live. Another says he can make brick for \$2.75 and pick his jobs where hauling is light. It would seem from this that the yards of large capacity and larger fixed expenses will have no easy contract to run out or ruin the smaller yards in St. Louis.

The Brickmakers' Association still keep up their organization minus the Hydraulic Press Brick Co. That company sent in resignation by mail, special delivery stamp attached, and prices went off next morning \$1.60 per M, as stated above.

The American Hydraulic are rebuilding their plant at Collinsville, Ill., and will soon be in the market with their regular line of face brick.

The strike in the East Side, Belleville, Collinsville, Glen Carbon, etc., is still on.

Anthony Ittner is running both his yards, but not altogether satisfactorily.

John Day, at Belleville, is shut down, and is willing to keep closed under the circumstances.

The Illinois Hydraulic Co., at Collinsville, are loading brick filling orders, but not running. About 150 strikers swooped down on the yard one day about a week ago and were warned off by Mr. Thompson, the superintendent. Being strangers to Mr. T., and not coming with proper credentials, he declined to acknowledge their acquaintance, and begged them to keep away with a shotgun in his hands. If they had known anything whatever about Thompson they would have left. His men knew him and kept in the background. The strangers proposed killing him, and doing other naughty things which strikers usually do, and the next thing they knew two were badly wounded and the other 143 were scampering away from the yard with only two men in charge—Thompson and his son.

There are all sorts of rumors afloat about extending the strike to St. Louis yards, but no developments at this date.

Prices of face brick are also on. Best red pressed brick \$9.00 per M delivered at building. Gray brick, which sold last year at \$25.00, now \$10.00. One sale reported of buff brick at \$7.50, former price \$14.00. In fact, the market is demoralized completely, and there are no prices.

The Winkle Terra Cotta Co. is turning out a high-class product and furnishing the Lincoln Trust Co. with a beautiful brown and the Brown building with white. They also have a \$20,000 contract for the new Merimod Jaccard building.

Evens & Howard also report demand for their terra cotta increasing. They secured five new contracts in June and are running full force.

Laclede Fire Brick Co. and Christy Fire Clay Co. report demand for fire brick goods and are shipping largely.

If the war is over and peace declared before September, the clay industries of St. Louis look for a good business in the fall.

A. SAINT.





Ontario Paving Brick Co., Toronto, Canada, use two.  
McAvoy Vitrified Brick Co., Perkiomen Junction, Pa., use one.  
American Clay Mfg Co., Pittsburgh, Pa., use one.

Is

Clarksburg High Grade Shale Brick Co., Clarksburg, W. Va., use one.  
Reese, Hammond & Co., Bolivar, Pa., use two.  
Welch, Gloninger & Co., Vanport, Pa., use one.

Certainly

Kensington Brick Co., Pittsburgh, Pa., use two.  
Edenburg Brick Co., Edenburg, Pa., use one.  
J. W. Minor, Thomas, Ala., use one.

The

Excelsior Brick Co., Montgomery, Ala., use one.  
Mack Mfg Co., New Cumberland, W. Va., use two.  
H. Duval & Co., Kingston, Jamaica, use two.

Only

Queen City Brick and Tile Co., Cumberland, Md., use one.  
Douglass-Whistler Brick Co., Vanport Pa., use one.  
W. R. Meredith & Bro., Punxsutawney, Pa., use one.

Re-Press

SIX  
MONTHS  
RECORD

+ OF THE +

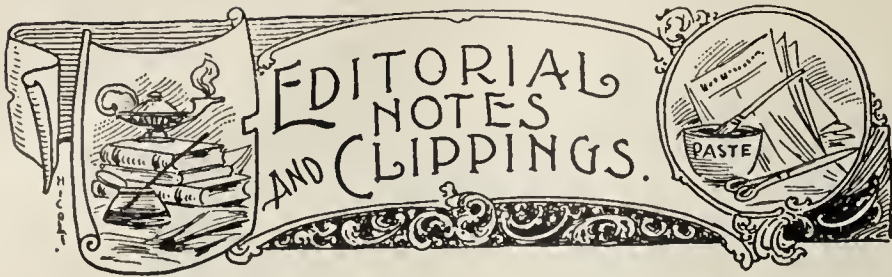
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RE-PRESS

TWENTY OF THESE POPULAR  
RE-PRESSES SOLD AND  
PLACED IN SUCCESSFUL OP-  
ERATION DURING THAT TIME.

C. W. RAYMOND & CO.

DAYTON, OHIO.





They, who poor saddles must bestride,  
Will find that sad'll be their ride.

—[Exchange.]

Hopkinsville, Ky., so a local paper says, is in need of a brick yard.

Hallen & Sackville have started a new brick yard at Hartney, Manitoba.

F. E. Vawter contemplates going into the brick business at Industry, Ill.

The brick plant of Dan'l T. Gohn, at Columbia, Pa., was slightly damaged by fire July 2.

Jno. A. Chenoweth, President of the Indiana Clay Co., died at his home in Shoals, Ind., recently.

Jno. Green has leased the brickyard of Geo. Behymer at Celina, Ohio, and is now operating same.

Michaels & McBride, of Taylorsville, Ill., have purchased the Carlinville (Ill.) Brick and Tile Works.

Ropp & Emerson, brick manufacturers of York City, Pa., suffered a slight damage by fire recently.

The Jones Brick Co., Knoxville, Tenn., suffered a loss of \$200 by the burning of some kiln sheds June 27.

J. Stocker & Son, of New Ulm, Minn., desire to purchase a good second-hand "Quaker" brick machine.

W. G. Sharp has leased the brick yard at Lorain, Ohio, and will at once begin the manufacture of brick.

The Brewer Pottery and Clay Mnfg. Co. has been incorporated at Warren, Ohio. They have a capital stock of \$100,000.

J. M. Leach & Co. are running their brick plant at Kokomo, Ind., to its full capacity, and say they are fairly overwhelmed with orders.

Some kiln sheds at the brick yards of Booth & Flinn, at Ruch's Hill, Pittsburg, Pa., were damaged to the extent of \$500 by fire recently.

Gelhart & Green's pottery plant, located at Atwater, Ohio, was completely destroyed by fire June 24th. The loss is \$15,000, with \$4,000 insurance.

A brick famine exists at LaCrosse, Wis. and vicinity according to the papers in that section. Contractors are unable to secure first-class brick.

The brick yard of Tompkins & Smith, at Lockport, N. Y., which has been closed down for some little time, has started up again and is running full time.

The Norwalk (Ohio) Brick Co. have recently put in a Henry Martin Machine of 45,000 daily capacity, and are very much pleased with the work of the machine.

In a recent letter Chas. Berrick's Sons, brick manufacturers of Buffalo, say the demand for brick is fairly good with price of common building brick at \$6.00 per thousand.

The Settle brickyard at Clarksville, Tenn., has been purchased by E. H. Wilkerson & Co., who will make some improvements in the plant preparatory to operating it.

D. J. Young, proprietor of an immense brick plant at Ft. Smith, Ark., reports business as booming. He says he has a large number of contracts on hand with more in view.

Wm. O. Roselius, Syracuse, Neb., is in the market for a small auger machine to be run by horse power. He says he can work his clay deposit from the bank if he has proper machinery.

H. Brewer & Co., of Tecumseh, Mich., advise us that their business this year is more than double that of the same period for 1897. They consider the prospects for the balance of the season very good.

Geo. Kreiger has leased the brickyard of Oro Dell, near Union, Ore., and will at once put men at work preparing same for the manufacture of brick. He has just secured a contract for a 1,000,000 brick for an immense sugar factory which he expects to fill by the 1st of October.

The Hawking Brick Co. have just put in a new equipment of machinery for manufacturing brick by steam power at their plant at Patoka, Ill., and will soon be ready to furnish a fine quality of pressed brick.

Some sheds belonging to the Albany (Ga.) Brick Co. caught fire on the afternoon of June 13th and before the flames could be extinguished, \$2,000 worth of damage had been done. This is partly covered by insurance.

Wm. Berner, a well-known resident of Hamburg, Pa., died of Bright's disease at his home in that city last month. Mr. Berner had been engaged in the pottery business for a number of years. He leaves a wife and four children.

A disastrous fire occurred at the brick plant of Jno. Wild & Son, Toledo, O., July 9th, which almost wiped out the plant. Mr. Wild estimates his loss at \$5,550. He says he carried insurance of \$1,250, and that he will rebuild at once.

P. Bannon, the well-known brick manufacturer of Louisville, Ky., secured an 800,000 vitrified brick order from the National Tobacco Co. for their new factory. This is one of the largest brick contracts let in Louisville for some time.

Jno. Nonnemacher, who for many years has been engaged in the brick business at Allentown, Pa., died at his home in that city June 27. Mr. Nonnemacher was born in Allentown eighty years ago and all of his life had been spent in that town.

Frank Coombs and T. C. King will establish a brick plant at Great Falls, Mont. They have an order on hand for 2,000,000 brick for the Boston & Montana Smelter, which will keep them running steady for some time, irrespective of other orders.

Jno. D. Neff and S. C. Cline, who have purchased land at Appono, Pa., on which to establish a brick yard, have purchased the necessary machinery, and work on the new plant is progressing rapidly. They hope to be making brick in a short time.

Dinnie Bros., of Grand Forks, N. Dak., have recently put a Potts Horizontal Brick Machine in at their brick yard and are now turning out 30,000 first-class brick a day. They report themselves well pleased with the work the new machine is doing.

H. C. Patton has been making some improvements in his brick and tile plant at Flannagan, Ill. Among other improvements he has put in a new brick machine and expects ere long to be turning out as good brick as can be found in the Sucker State.

An unsuccessful attempt was made on the night of July 5 to blow open the safe of Jas. Moore & Co., brick manufacturers, at Albany, N. Y. Failing in this, the burglars forced Mr. Moore's desk and ransacked the drawers, but nothing of importance was taken.

G. Coldewe & Co., Milwaukee, Wis., manufacturers of brick molds, say that while not rushed with orders, their business this year has been better than that of last. They were among the first firms in this country to make a specialty of brick molds. Their factory is equipped with special machinery, which enables them to turn out molds of a character that defies competition. Mr. Coldewe gives the business his personal attention and sees to it that every order is filled conscientiously. As a result his oldest customers are his best customers. Among them they mention the Wittmer Brick Co., of Pittsburg, whom they have supplied with molds for many years. It seems like a case of "sending coals to Newcastle," but freight rates

[CONTINUED ON PAGE 54.]

## INDIANA PAVING BLOCK,

The Standard Shale Block for  
Street Paving.

Manufactured at Brazil, Ind., by the

**Indiana Bermudez Asphalt Co.,**

Main Office, 25 and 26 Baldwin Block,  
INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.



T. B. McAVOY,  
President.

FRANK B. McAVOY,  
Secretary and Treasurer.

# McAvoy Vitrified Brick Company,

OF Philadelphia, Penn.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee. Correspondence solicited.

OFFICE:  
1345 Arch St., Philadelphia.

WORKS:  
Perkiomen Junction, Penn.

# The Purington Paving Brick Co., of Galesburg, Illinois,

 AS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business. Correspondence respectfully solicited.



## EDITORIAL NOTES AND CLIPPINGS.—Continued.

are so low that Coldewe & Co. find they can ship to almost any point in the States, with little, if any, extra cost to the purchaser. Now is a good time to buy molds for prices are low. Write them for figures, mentioning the Clay-Worker.

The Coffeyville Vitrified Brick Co. have secured a location for a plant in the gas fields at Cherryvale, Kansas. They will commence boring for gas at once, and as soon as a sufficient supply is assured will place orders for machinery for a plant of 100,000 capacity per day.

A wind storm at Little Ferry, N. J. caused considerable damage at the brickyard of N. Mehrhof & Co., tearing off the roofs of kiln sheds and ruining 15,000 brick in a newly stacked kiln. Boards were blown wildly around, and one of the employees was quite badly injured.

The brick plant of E. L. Cook, located at State Farm, Mass., was totally destroyed by fire July 1st. The origin of the fire is unknown. Mr. Cook estimates his loss at \$15,000. He carried an insurance of \$7,000, but was filling a large number of orders that he cannot well afford to lose.

Capt. Nelson Mackey, one of the best known citizens of San Antonio, Texas, died quiet unexpectedly June 9th. Capt. Mackey organized the Mackey Brick & Tile Co. at San Antonio some twelve or fifteen years ago, and later established a large brick and sewer pipe factory near there.

Matthew Lanz, senior member of the firm of M. Lanz & Sons, brick manufacturers at Pittsburg, Pa., died June 21st, aged 72 years. Mr. Lanz had been engaged in the brick business nearly twenty years. He is survived by four sons and one daughter. The business will in all probability be carried on by the sons.

The brick plant of Mowbray & Lowes, at Genesee, Ill., was damaged to the extent of \$1,000 by flood June 30. Three kilns of brick at various stages of burning were completely destroyed and in addition to this a number of tools and wagons, etc., were lost. A peculiar incident is that six years ago to the day, Genesee was visited by a similar flood.

The employees of the Atlanta (Ga.) Terra Cotta Co. purchased an immense flag, which was unfurled over their shops Saturday, June 25th, with appropriate ceremonies. Neat invitations for the event were issued, stating that Col. W. T. Moyer would be orator of the day and that following the speech-making refreshments would be served.

The works of the Pioneer Fire Proof Construction Co. at Ottawa, Ill., which was burned a year or more ago, will be rebuilt at once. The buildings will all be fire proof, and will be equipped with modern machinery and the plant will be a model one in every respect. They have a large number of orders on hand and so want to be ready for operation as soon as possible.

The Erskine Brick Co. started their brick plant at Crookston, Minn., full handed the 1st of June, having equipped their plant throughout this spring with a Potts Horizontal Machine, disintegrator, granulator, winding drum and cars. They had formerly soaked their clay in pits but now with their new machinery work it direct from the bank, making, they say, a better quality of brick at a great saving of labor. They make 40,000 brick per day and are unable to supply the demand even at that rate.

The brick manufacturing firm of Egge & Huber, at Allentown, Pa., retired from business. Some time since the junior partner, W. P. Huber, a son-in-law of Mr. Egge, died, leaving the management of the business to Mr. Wm. J. Egge. Mr. Egge is seventy-eight years old, and having been actively engaged in the brick business for fifty-three years, concluded he had earned a rest, so all the machinery and appliances of the plant have been sold and the land leased to the Swoyer Bros., who will mine the clay and draw it by cable to their plant, a block distant.

The East Grand Forks Brick Co. report a good trade. They say they purchased a Potts Horizontal Machine early in the spring. It has been running steady for two months now, turning out 35,000 to 40,000 daily, and is giving the best of satisfaction. In common with other brick makers of that section they formerly prepared the clay in soak pits, but now use it direct from the bank, thereby saving time, labor and expense.

The number of accidents occurring through the caving in of clay banks have been unusually large the past month. Three men were badly injured by a cave-in at the Frederick (Md.) Brick Works, June 18th. An employe of the brick plant at Chestertown, Ind., was crushed to death by the bank caving in on

him. Another man was so badly injured by a cave-in at a brick yard at Cape May, N. J. that he died a few days after. A colored man working in the clay bank at Simms' brick yard at Los Angeles, Cal., was caught under a falling bank and seriously injured. Two men were killed and another injured by the caving in of the clay bank at the Mechanicsville (N. Y.) Brick Co.'s plant.

## NOTES BY THE WAY.

—Pittsburg, Pa.—

DESPITE THE depressing effect the war had on the building industry, the brick trade in the "Brick City" is in a fairly prosperous condition. Contractors are generally busy with immediate orders, while there is a lot of business ahead. Many contracts cannot now be filled, owing to the inadequate capacity of the manufacturers of structural iron though they are working night and day. The same complaint is heard in every great centre of industry.

H. L. Irwin, manager for C. W. Raymond & Co., Dayton, Ohio, reports movements in brick machinery as satisfactory.

Samuel Francis, of W. & J. Francis & Co., says their sales of stock, select, paving and common brick leave no room for complaint.

Buente & Martin, local salesmen for the Kittanning buff brick have recently secured some profitable contracts.

W. R. Weaver, secretary of the National Brick Co., is proud of his record for the season. He says their red press brick is still considered the standard.

Booth & Flinn, Ltd., are doing a good deal in red press and stock brick. They always do a large business in common brick, turning out on an average 100,000 a day the year round.

Our deliveries of mill and paving brick are quite satisfactory to date, McKelsey & Hosack said.

J. N. Wanner, secretary of the Guyasuta Brick Co. Ltd., reports a good regular demand, though some deliveries have been delayed through contractors inability to secure material in time.

The Boyd Hill Brick Co., in red brick, and R. Knowlson & Son, in plain, ornamental and building brick, and the Mack Mfg. Co. in pavers, report equally satisfactory trade conditions.

There are some thirty manufacturers represented in this city, Pittsburg being a very prolific market in both brick and tile and fire proofing material. Not alone is brick material predominating for residence and general business purposes, but the modern feature of the factories and mills in and about Pittsburg is the same.

—Buffalo, N. Y.—

Trade here is a little dull just now, but the outlook is encouraging. The supply required on contracts to be executed this year will keep all the yards busy for months to come.

There are some fourteen manufacturers doing business here.

Bray & Booth, who control the Diamond Fire Clay Co., are especially busy with sewer pipe.

Brush Bros., who occupy office with Brush & Schmidt, are doing a satisfactory business, according to Wm. H. Brush.

John Lyth & Son are marketing a goodly quantity of pressed and ornamental brick, and immense quantities of sewer pipe.

N. C. Barnum, manager of the Buffalo Sewer Pipe Co. thinks the outlook is good.

Chas. Berrick's Sons are a busy concern. They make common brick principally, but also handle a goodly quantity of pressed and ornamental brick.

C. M. McCutcheon, president of the Buffalo Star Brick Co., says the brick business has a healthier tone than for several years, but refers to a surplus of cut-throat competition.

—Rochester, N. Y.—

E. J. Burke, the resident general manager of the N. Y. Hydraulic Press Brick Co. is serenely satisfied with the volume thus far moved. Buff, gold, red, gray, pink and brown, in standard, ornamental or Roman shapes, all types are popular and the demand is about evenly divided.

Whitmore, Rauber & Vicinus, who control the Rochester German Brick and Tile Co., are busy filling contracts for building brick.

W. H. H. Rogers, of the Rochester Brick & Tile Mfg. Co., reports the demand for building brick of normal average.

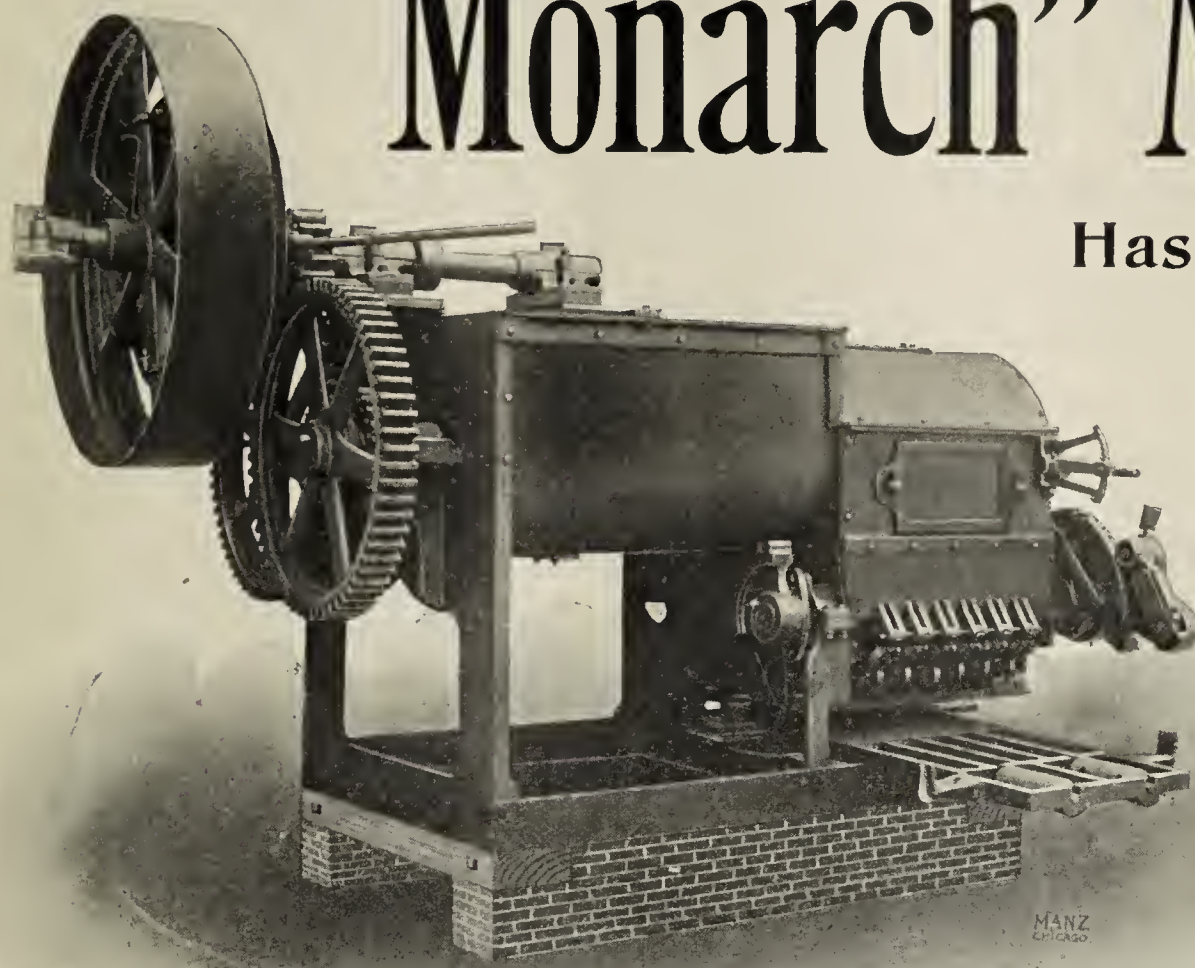
Movements in Northern Ohio are of fair order. Builders are very busy at Cleveland, and large contracts are now in negotiation. This has been a prosperous season for the Cleveland trade, considering the records of former years.

A. MISSIONARY.



FOUR STYLES OF....

# "Monarch" Machines



Has Double Pug Mills,

Giving the most tempering capacity of any Machine made.

Double Presses

Giving the most pressing capacity of any machine made.

Presses

Are "all in the mud," thereby eliminating all unnecessary friction and wear.



These and other MOST IMPORTANT points which are

IN NO OTHER.

## The "Iron Quaker" Machines

For 1898 are BETTER THAN EVER.

This cut shows the steam power in connection with our Mould Sander.

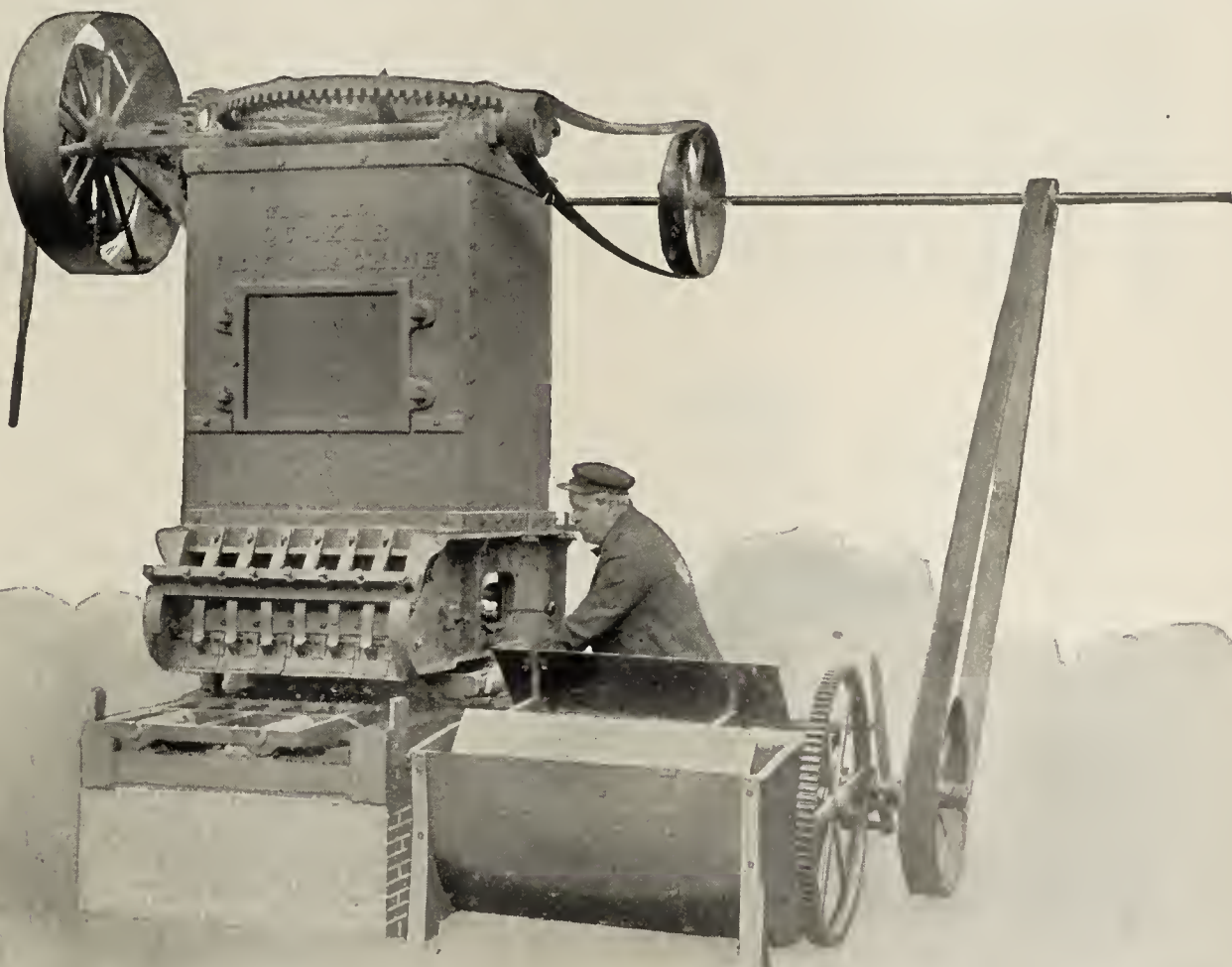
## Our Horse-Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

## Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE. At Bargain Prices.

Odd sizes of moulds. Have not been used.

20 moulds, 8 13-16 x 4 3-16 x 2 7-16. 9-16 in. partitions.  
2 moulds 9x4 1/8 x 2 5/8. 9-16 inch partitions.  
3 hand moulds (3's) standard size.

Second-hand, but used a few days only.

10 moulds, 9 1/2 x 4 9-16 x 2 3/4. 1/2 inch partitions.  
19 moulds, 9 1/2 x 4 5/8 x 2 9-16. 1/2 inch partitions.  
16 moulds 9x4 1/2 x 2 1/2. 9-16 inch partitions.  
19 moulds, 9 x 4 3/8 x 12 1/4.

The Wellington Machine Co.,  
WELLINGTON,  
OHIO.

Send for Circular.



Written for the CLAY-WORKER.

### PACIFIC COAST NEWS.

THE SAN FRANCISCO brick trade is waiting for a turn in the tide which will bring to it life and vigor. As it is now one day is like another, as there is always a certain amount of trade done, but no big contracts to bid or figure on. Quite a little building is going on and that makes the demand for common brick good.

William Stevens has commenced making brick at Kendrick, Idaho, having contracts amounting to about 200,000.

Frank Nugent of Pomona, Cal., was in Covina, Cal., recently looking for clay suitable for making brick.

J. C. Milligan has finished the burning of a kiln of 150,000 brick at Flagstaff, Arizona.

Easum & Co.'s brick yard at South Colfax, Wash., has started up again, turning out 25,000 brick daily.

The United Verde Copper Co., at Phoenix, Arizona, has contracted for 2,000,000 brick for new buildings to be erected by the company.

The Simons Bros. will use petroleum for fuel in their new brick yard in Los Angeles, Cal., being one out of only four or five brick factories in the United States that have adopted this fuel successfully. Their new plant is of the most complete and modern style and has cost about \$20,000.

It is reported that a gentleman, prominent in business circles at West Anaheim, Cal., contemplates the establishment of a brick yard at that place. It is understood that all the facilities necessary for the successful manufacture of brick can be obtained in that vicinity. The materials are convenient and of good quality, and the various branches of the Southern Pacific railroad will afford convenient transportation to market the brick.

E. T. Maple, a manufacturer of terra cotta and fancy brick at Stockton, Cal., and who recently built a plant south of the City Homestead, has filed a petition in insolvency. He gives a list of debts amounting to \$12,117.90, and his assets are stated to be real estate worth \$6,423.92, which is encumbered to the

amount of \$8,771.40, personal property worth \$4,728.50, of which he claims \$435.56 is exempt.

Judge Maxwell, of Gallup, New Mexico, is having a kiln of 1,000,000 brick put up at the new brick yard there.

Eight or ten valuable mineral claims have been located on the line of the Washington state road survey from Buckley to Yakima. The claims not only yield a fair per cent. of gold, but contain vast deposits of fire clay, kaolin, magnesia, Chinese tallow and sulphur, all of which are said to be very valuable. The claims were located by parties living at Orting and Burnett, Wash., and the former company has sunk a number of shafts and tunnels, showing that the extent of the kaolin and Chinese tallow or talc deposits is practically inexhaustible, while the assays made for the precious metals were entirely satisfactory. By testing the kaolin or magnesite as a fire clay, it was found to be of an uncommon quality, and resisted satisfactorily a heat of 4,100 degrees, a heat intense enough to melt down the furnace in which the test was made. This kaolin is pure white, but has more or less grit in its composition, and is chiefly valuable as fire clay or table ware.

The new pipe line of the Lugonia Water Co., at Redlands, Cal., is now completed. The total length of the system is 53,300 feet, or a little more than ten miles. It is built entirely of vitrified pipe, nearly all of which is 18 inch and 14 inch. The total amount of the contract was about \$40,000. The pipe used in this great system was furnished in equal quantities by the California Sewer Pipe Co. and the Pacific Clay Manufacturing Co., comprising the Los Angeles, Cal., Sewer Pipe Association.

A new manufacturing industry that will prove of great importance to Fresno, Cal., and vicinity has been established about two miles from the former city by C. J. Craycroft & Son, namely, the construction of an immense brick factory.

Charles Wing is closing in his kiln of 300,000 brick at Tempe, Arizona, preparatory to burning it.

Kennedy & Grinn are now burning 150,000 brick for the new court house at Holbrook, Arizona.

J. P. English is burning a 45,000 brick kiln at Hanford, Cal.

Brick is in demand at present for building purposes at Ventura, Cal., Mitchell Bros. have just finished burning 150,000 brick, and are making preparations for another kiln. The demand for brick is brisk, an indication that building in that city and county is going on rapidly.

SUNSET.

# Points to Be Remembered



## In Buying a Brick Machine.

Don't think any old thing is good enough. The man with a Big Order and a Broken Down Machine is **STUCK**, just like the fellow in the wire fence.

The **POINTS TO BE REMEMBERED** on our machinery are, **STRENGTH**, **SIMPLICITY** and **DURABILITY**, and these good points apply to all our machines, dry press, stiff clay, or soft clay.

Our new Berg Dry Press is making a sensation, and our Stiff and Soft Clay Machines are equally good in their way.

Anything you want, and all **Up-to-Date**.

**CHICAGO BRICK MACHINERY CO., 225 Dearborn St.**

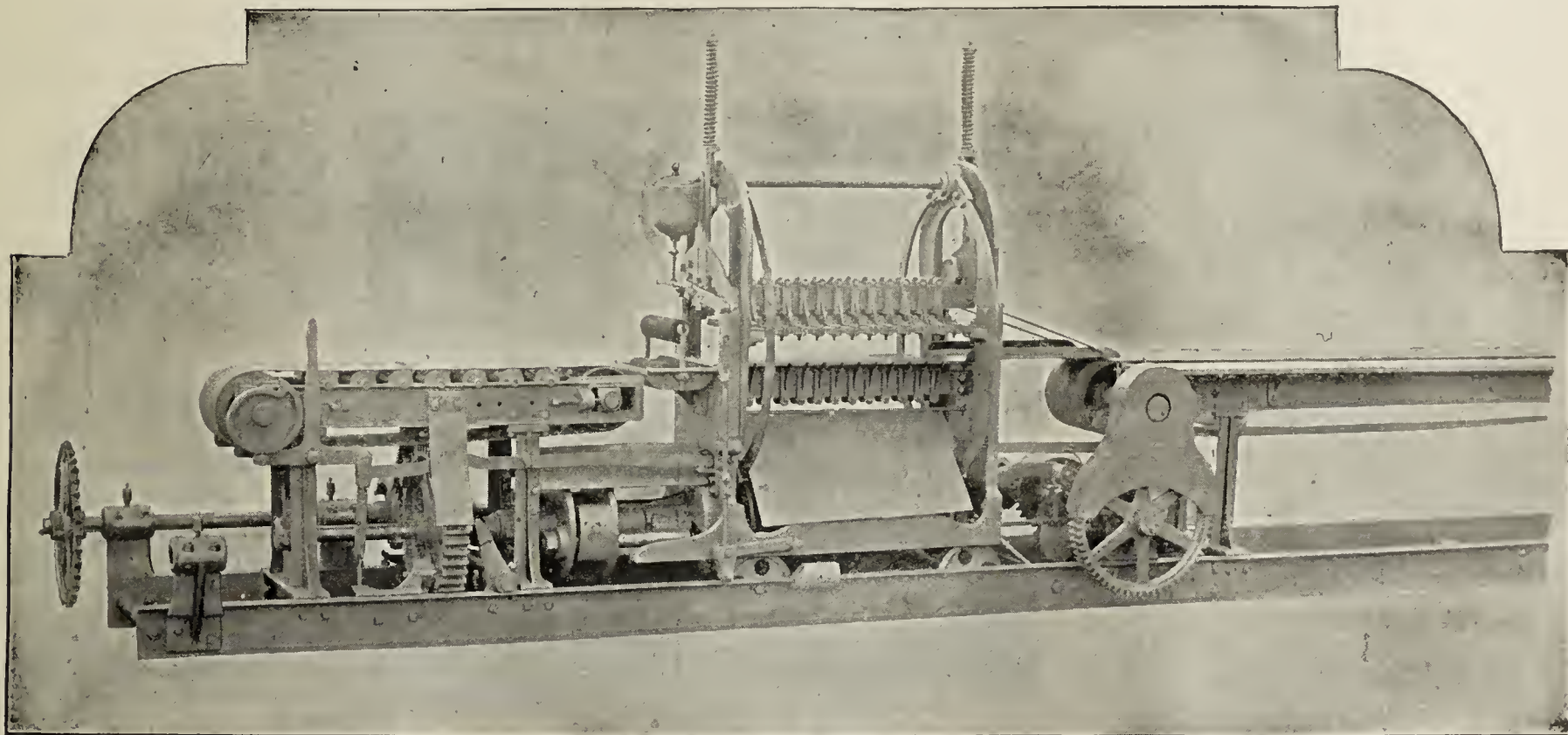


CUNNINGHAM'S IMPROVED COMBINED

# Automatic Cutting Table,

*Cuts Both Side and End Cut Brick.*

THERE is no branch of the clay working machinery business that has acquired more thought and expenditure of money than has the Automatic Brick Cutters, the result of which is, there are many good Automatic Cutters that will cut either end or side cut brick, but until we presented our improved Combination Cutter to the trade there was none that would cut both, therefore, we feel justified in claiming priority.



COMPACT, SIMPLE, DURABLE and ACCURATE.

No swelling of the bar of clay.

Will work in connection with any make of machine.

Has capacity of from 1 to 200 brick per minute.

We cut both end and side cut brick with one table.

Cutter is provided with safety device to prevent it from breaking.

Only four feet of clay between the Cutter and the brick die.

The bar of clay is held firm while it is being cut, which insures perfectly straight cut brick.

Made of iron and steel, high grade workmanship; Friction reduced to a minimum by anti-friction bearing.

Only 10 brick beyond the last one cut, which prevents them from sticking together.

Clamping the bar of clay on the top and on the bottom strengthens and and smoothes the surface giving the brick the appearance of pressed brick.

The wires have a sheering action, being set on an angle which prevents ridged and feathered edges on the face of the brick.

No machinery driven by the registering belt, which overcomes the annoyance of the bar of clay sticking to the belt and marring the bottom of the brick.

The wires pass up at one stroke and down at the next, which overcomes the sliding of the bar of clay from one side to the other.

## Points

## of....

## Advantage:

It Does Perfect Work. Write for Descriptive Circular.

# Wallace Manufacturing Co.,

CHICAGO AGENTS:

Chicago Brick Machinery Co., Chicago, Ill.

FRANKFORT, IND.

See Ad. on Page 83.



## SELECTING DRAIN TILE.

Drain tile should be selected with care, to give the best results when well laid. The color is a matter which depends upon the clay largely. If the clay has quite a good deal of iron in it, the tile burn red, or, if burned very hard, the color is a dark brown. Some clay, for want of iron, burn almost white or gray or buff colors. A tile may be well burned, and in every other respect a good tile, though lightly colored. Tile that are well burned will have a clear ring when struck together.

A choice tile should be well burned, straight, round, smooth ends, free from cracks, smooth inside especially, and uniform in size. Some clays, when burned a little hard, shrink so that the tile most exposed to the heat are likely to be smaller than other tile of the same size in diameter when set in the kiln.

The wall of a tile should be thick enough to insure its safe transportation in wagons and cars. There is much difference in clays as to their toughness. The wall of a tile made from a good clay may be light and strong enough for all practical purposes, and the wall of a tile made from a tender clay may need to be double the thickness of the former and not be stronger. Select the best tile; they will in the end give the best satisfaction.

The work of laying a drain is, if well done, the most permanent improvement that can be made on the farm—to last for generations yet to come—so that we can well afford to use the best material and do the work in the best manner.

**WANTED**—Position as enameleer in brick or tile works. Practical man, several years experience in pottery and brick work. Address 71 e "B" care Clay-Worker.

**WANTED**—By an experienced enameleer, a position with a firm of first-class standing. Every proof of ability given. Address 62 em. COPE, Care Clay-Worker.

**WANTED**—Position as superintendent. Chambers Bros. machine preferred. Ten years experience. Salary moderate to commence. 71 em THOMAS, care Clay-Worker.

**WANTED**—One iron frame nine foot dry pan and two hundred roller bearing iron cars. Must be in good condition. COFFEYVILLE VITRIFIED BRICK CO., 71 t Coffeyville, Kan.

**FOR SALE**—Steam brick plant at Yankton, S. D. Hoffman kiln. Only yard in town and good shipping point; three railroads. Jonathan Creager machine, engine, boiler, pallets, etc. For sale separate if desirable. Address 71 t HENRY WAGNER, Yankton, S. D.

**WANTED**—Position as Superintendent or manager, by man of 15 years experience. Have good position but on account of bad health of family would like to change. Address SUPERINTENDENT, care Clay-Worker. 71 c

**WANTED**—To correspond with parties wanting crusher that will grind any kind of clay or shale, wet or dry tough clay direct from the bank, impossible to elog crusher; capacity sixty thousand; less power than required for one dry pan. Address D. KENNEDY, JR., 71 c 246 W 9th St., Erie, Pa.

**FOR SALE**—Brick and tile plant located in central Illinois. Have made and sold at good prices for cash, 400,000 tile since April 1st to July 1st, 1898. Two railroads in the yard. Kiln capacity 300,000 brick. Best of shale, vitrifying at a low temperature. Coal 50 cents per ton on the yard. Other business interest demanding attention cause for wanting to sell. No competition. Address BRONAUGH BROS. 73 c Virden, Ill.

## FOR SALE OR LEASE.

A well equipped Virginia brick plant, near a large city, affording a good market. The present price of common brick is \$7 a thousand, Pavers \$9 to \$10. Abundance of excellent clay and cheap fuel. A splendid opportunity for a practical, industrious man. For full particulars. Address "WIDOW," 7 tf 1 care Clay-Worker.

## The Best Brick Drier



Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, 161 Grand Street, Rahway, N. J.



Arthur True,

39 East 28th St.,  
NEW YORK.

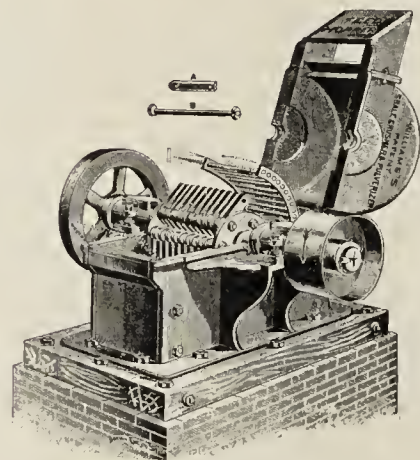
Dealer in....

Antiques,  
Rare Old Furniture,  
English Mantel Clocks,  
Old Prints and Paintings,  
Old Jewelry and Curios.

Also, Fine Collection American Historical Blue Plates.

# Williams's Combined Shale Crusher and Clay Pulverizer,

A Clay Pulverizer of Wonderful Capacity:



WILLIAMS'S SHALE AND CLAY PULVERIZER, with Clay Steamer Attached.

Our Pulverizer is Fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.

These machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known. Will guarantee them under any and all circumstances.

The WILLIAMS PATENT  
CRUSHER & PULVERIZER CO.,

2705 North Broadway, St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.

Mention the CLAY-WORKER,

When writing to Advertisers

Mention the CLAY-WORKER



# G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and....

MACHINE **MOULDS**

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

## FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

**EVENS & HOWARD,**

920 Market Street, - - - ST. LOUIS, MO.

## CENTRAL MACHINE WORKS

MANUFACTURERS OF

**J. N. K. Brick Machines and  
P. L. Sword Brick Machine,  
Pug Mills and Clay Crushers.**

With our improved machines a superior quality of building brick can be made with less outlay of labor and capital than by any other method.

The J. N. K. Machine makes a fine front brick as cheaply as other machines make common brick. Full particulars for the asking.

**J. N. KAUFHOLZ,** Proprietor and Patentee,  
226-236 Abbey Street, CLEVELAND, OHIO.

# For Sale....

5,400 white pine pallets, 33 $\frac{3}{4}$  inches long, 10 inches wide, tops of four pieces  $\frac{7}{8}$ -inch thick, with three cleats 1 $\frac{1}{2}$ x $\frac{7}{8}$ -inch nailed on with wire nails, entirely new and first-class. Will be sold cheap if ordered at once.

**W. B. MERSHON & CO.,**  
Saginaw, East Side, Mich.

MENTION THE CLAY-WORKER,  
WHEN WRITING TO ADVERTISERS,  
MENTION THE CLAY-WORKER.

### FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

**FOR SALE.**—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 1 tf d JESSE T. MORGAN, Wilkes-Barre, Pa.

**NO DRY PRESS BRICK PLANT** complete without the Carmichael Clay Steamer.

T. W. CARMICHAEL,  
Inventor and Manufacturer,  
6 tf d Clarksburg, W. Va.

**FOR SALE**—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN, Room 13 Palmer House, Chicago, Ill. 3 t f d

**WANTED**—Position by a practical brick and tile superintendent, thoroughly understands the business in all departments; can give the best of references. Address 7 tp T. A. L., care Clay-Worker.

**FOR SALE**—One Barnhart style A,  $1\frac{1}{2}$  yard steam shovel, with a one yard dipper, slightly used. First class condition. 7 tf d HAYT & ALSIP CO., 313 Chamber of Commerce Bldg., Chicago, Ill.

**FOR SALE CHEAP.**—One Second-hand, double die Columbian Reppress; practically as good as new.

One Quaker Horse-power Brick Machine, in good order.

One Monarch Brick Machine, only used one short season. All in running order.

THE HORTON MFG. CO.,  
1 tf L. Painesville, Ohio.

**FIRE BRICK MANUFACTURERS** desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address 41 d SUPERINTENDENT, care Clay-Worker.

**FOR SALE**—Entire lot of machinery for manufacturing brick and tile. One one hundred H. P. engine; one dry pan, capacity 50 tons; one wet or mixing pan, capacity 50 tons; one steam press (Bruner make), capacity 10,000, with dies from 3 $\frac{1}{2}$  to 18 inches; one E. M. Freese & Co. brick table; one Dean Bros. force pump; one 40 H. P. boiler and a lot of shafting and pulleys; 60 rods of tramway and four dump cars. All in good order. Address, 63 cm. W. G. WILSON, assignee of Barber Bros. Lostant, Ills.

### FOR SALE.

Brick and tile plant in Elkhart county, Ind. Good clay for brick and tile; everything in good condition and running at present. Address, 71 cm J. L. JUDAY, Millersburg, Ind.

**\$1,666.66.**

Must close out half interest in brick and tile factory. Seven acres good tile clay, adjoins a live R. R. Junction town of 800 people; in southeastern Illinois; doing good business now. Nagle engine, Adrain Auger, capacity 10,000 brick, tile in proportion. Dies and cut off tables for tile and brick; down-draft kiln; new engine house; dry sheds 200 feet long, part two stories. Easily worth \$5,000, will sell half for value of one-third if sold by July 15. Come here and I will go with you to investigate. Don't waste time writing. DAY & GOODMAN, Att'ys, 71 cm Princeton, Ind.

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One quite new, four mould dry press brick machine, made by Boyd. One four mould dry press brick machine made by Fulton Iron Works, styled the Eureka. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator. One Straight Line Engine, 14 x 14 cylinder, excellent order. Five second-hand horizontal boilers, about 15 ft. lengths, 6 ft. diameters, 3-inch tubes, 50 to 60 h. p. Eight fans, 7 ft. in diameter.

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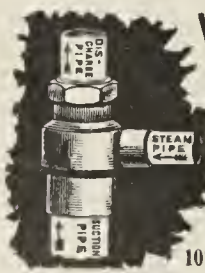
Two 8-foot dry grinding pans, under gear pan.  
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Large lot of steel and iron pallets.  
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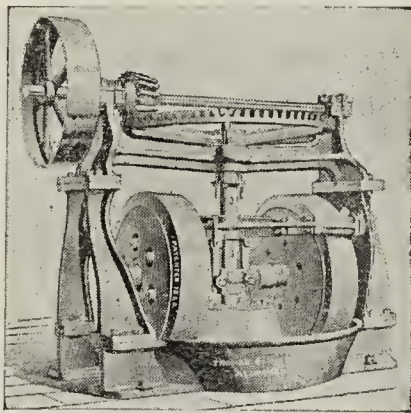
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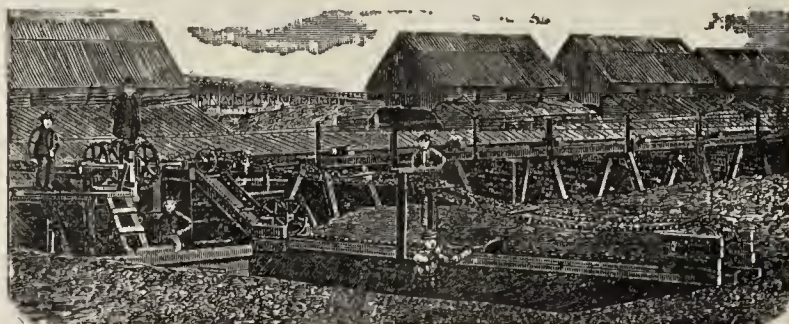
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Of the best quality of brick  
in a day than he can by the  
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time and making money.

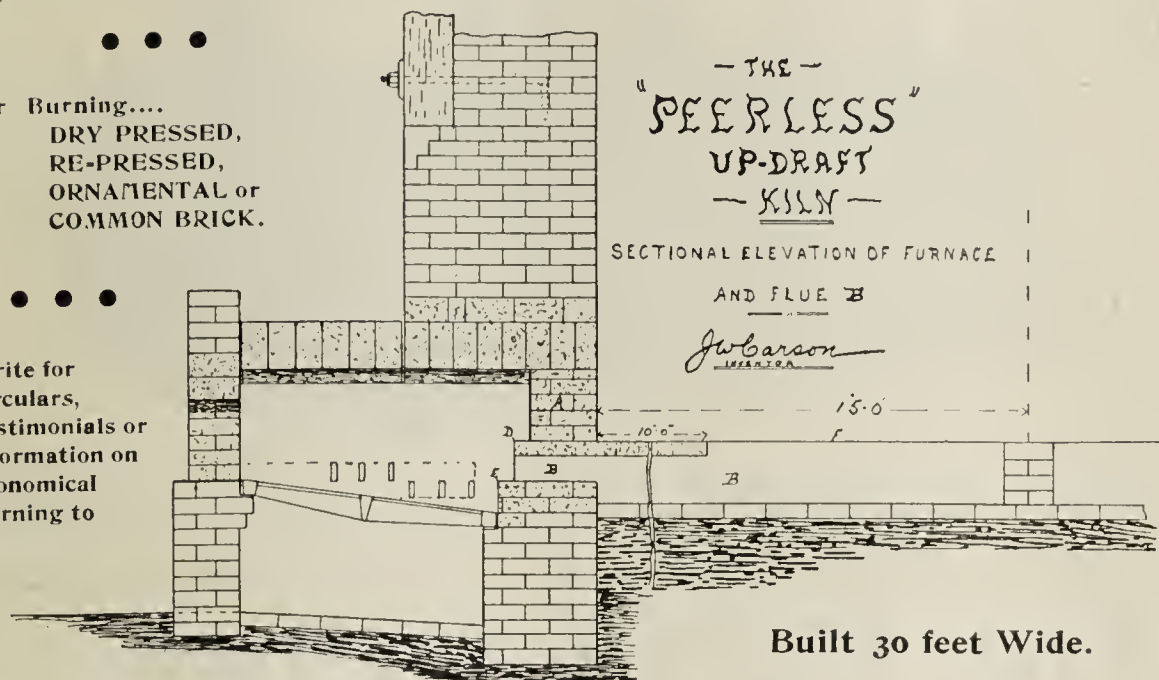
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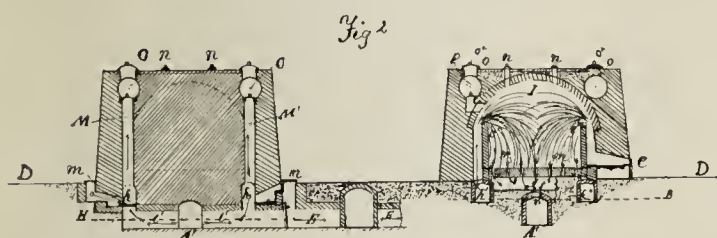
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This kiln is fired by suitable furnaces on each side of the tunnel, no fuel comes in contact with the clay ware, no firing through the top, no refraction from the down draft whatever; it saves as much fuel as the old Continuous fired through the top. It is adapted to use any suitable kind of fuel to burn clay ware. The automatic draft regulator assures an even draft at all times in every compartment in operation. The cooling of the clayware is fully controllable in the hand of the burner at will. The draft of the advance heat and combustion through the floor is connected from compartment to compartment until the heat is taken up by the wares before leaving the stack. The heat from the cooling compartments are drawn to the compartments for steam drying the green wares. For small yards it is not necessary to construct the full kiln, only build compartments as is necessary for the output and if the demand requires more kiln room, extend any time later. I guarantee that my Kiln will burn as clear color, sound enameled clay ware as any other down-draft kiln in use. Parties intending to improve their product and profit should not fail to correspond with me in regard to cost of construction and license right, which I will give for a reasonable living price. In corresponding, state the kind of material manufactured, also daily capacity, to the Inventor and Patentee,

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Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in  
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NEW YORK.

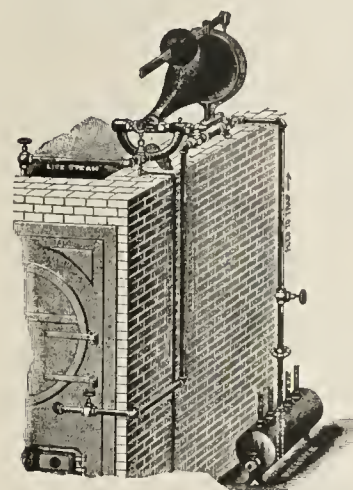
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The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

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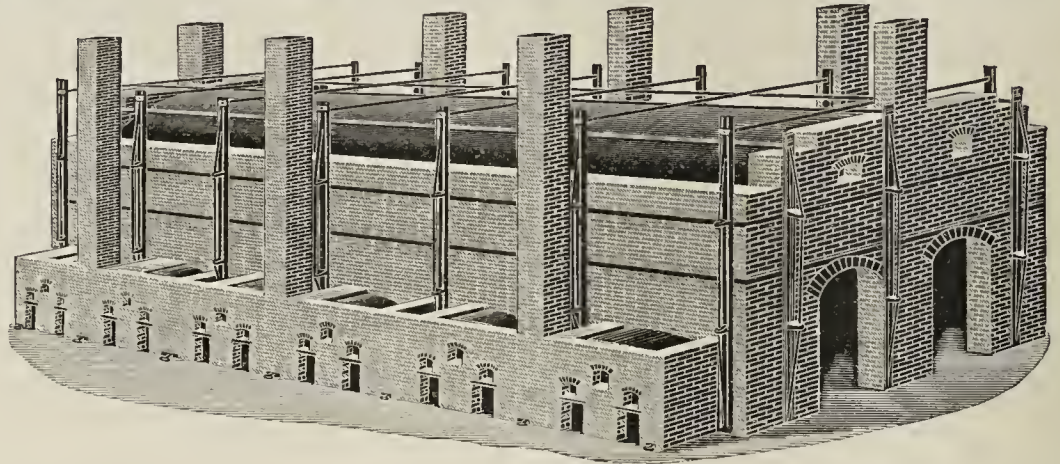
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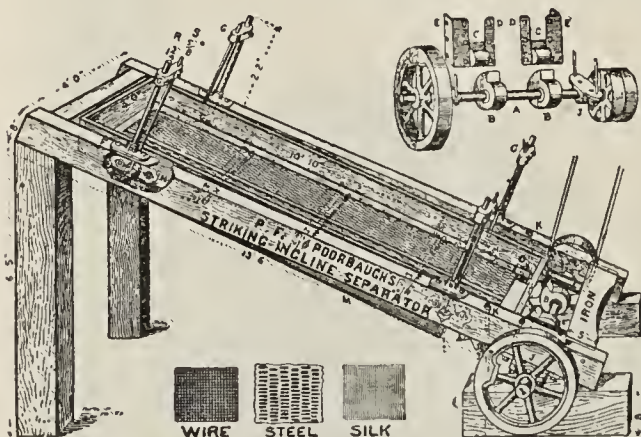
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Read this testimonial it is just what all users of The PERFECT CLAY SCREEN have to say. If it is a benefit to the treasurer of The National Brick Manufacturers' Association it will benefit you.

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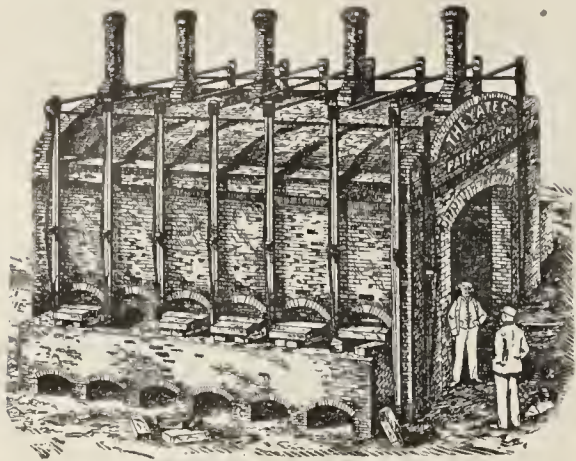
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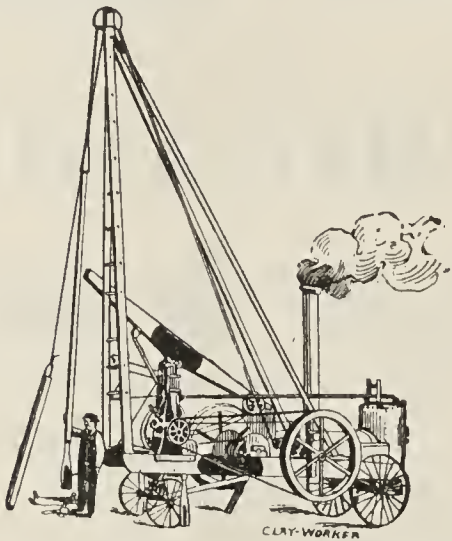
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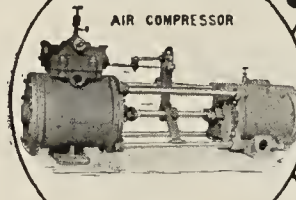
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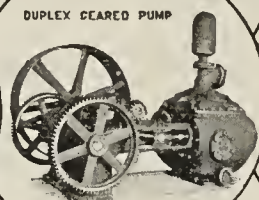
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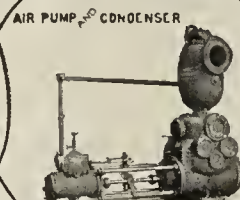
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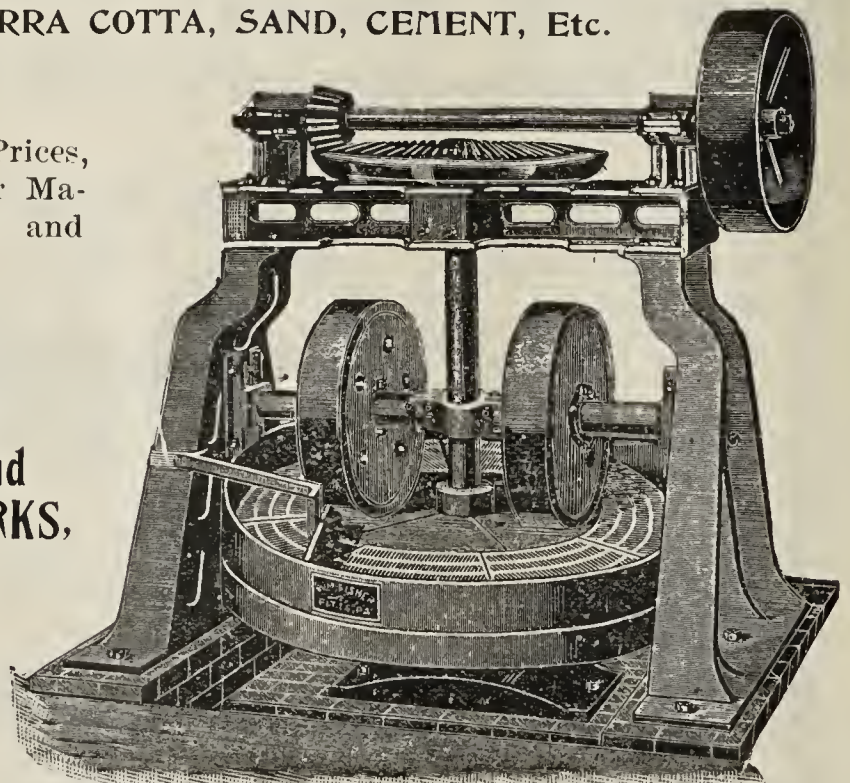
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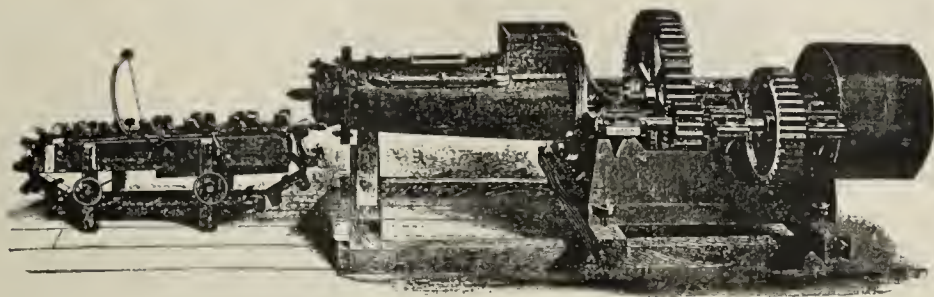


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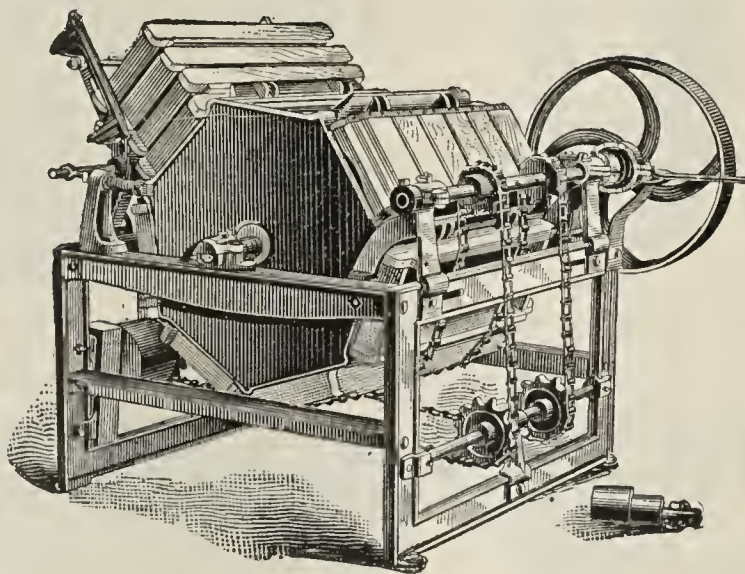
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## NIAGARA FALLS EXCURSION

Leave Indianapolis 11:15 a. m.,

Wednesday, Aug. 3, 1898,

RATE \$7.00.

... ALSO ...

Sandusky, Put-in-Bay,  
Cleveland and Buffalo,  
WITH SIDE TRIPS TO  
Lewiston, Toronto, Thousand Islands,  
Etc.

For tickets, rate, time and pamphlet containing general information, call on any ticket agent of the above route, or address  
C. F. DALY, G. P. A., Indianapolis, Ind.

SPECIAL EXCURSION  
CHAUTAUQUA, N. Y.,

July 8th to 29th.

Extremely Low Rate! via

“Big Four.”

For tickets and full information call on agents, or address the undersigned.

E. O. McCORMICK, WARREN J. LYNCH,  
Pass. Traffic Mgr. Ass. Gen. Pass. & Tkt. Agt.  
CINCINNATI, OHIO.



## VANDALIA LINE

The Short Line for

## ST. LOUIS AND THE WEST.

| LEAVE<br>INDIANAPOLIS, | AT. TERRE<br>HAUTE | AR. ST.<br>LOUIS. |
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| * 7:20 am              | 9:50 am            | .....             |
| * 8:10 am              | 10:10 am           | 3:15 pm           |
| * 12:40 noon           | 2:35 pm            | 7:12 pm           |
| * 7:00 pm              | 8:55 pm            | 1:44 am           |
| * 11:20 pm             | 1:30 am            | 7:00 am           |
| *Daily.                |                    |                   |

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

# WEST and SOUTH

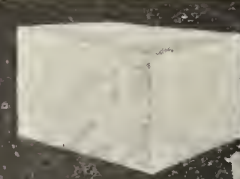
run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

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| South Dakota                  | Kentucky    |
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Presenting an unequaled territory for diversified industries, and possessing

**Fine Sites for New Mills,  
Best of Freight Facilities--Coal  
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Distributing Centers.  
Intelligent Help of all Kinds.  
Many Kinds of Raw Material.**

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.



**IT CUTS**  
**Some ICE**  
the kind of  
**"CUTS" you use.**  
Poor ENGRAVINGS will  
spoil your catalogue  
or advertisement.  
WE MAKE THE GOOD KIND.  
**IND'PL'S ENGRAVING AND ELECTRO' CO.**  
36 E. Washington St.

FIRE

**Dover Fire Brick Co.,**  
INCORPORATED 1870. MANUFACTURERS OF  
**Dover and Buckeye Fire Brick,**  
*Unexcelled for Kiln Purposes.*  
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

## Do You Want

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,  
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## Make Money

WITH THE ONLY SUCCESSFUL

## Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

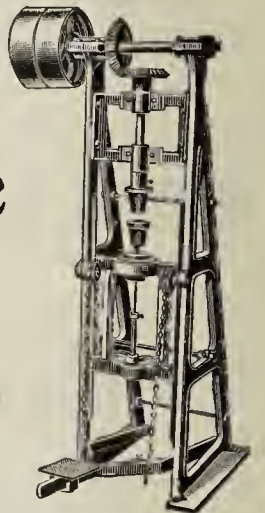
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| 6,000 two-inch Pots; | 3,500 five-inch Pots; |
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Write for Circular and prices.

**The Rockwood Mfg. Co.,**

78 South Pennsylvania St.,

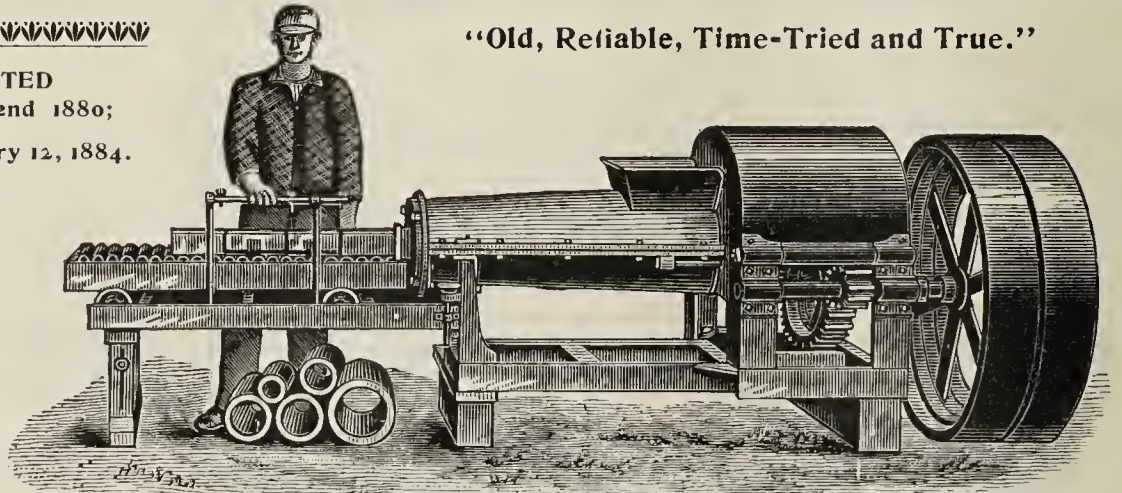
INDIANAPOLIS, IND.



# KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

PATENTED

June 22nd 1880;  
and  
February 12, 1884.



"Old, Reliable, Time-Tried and True."

P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the backs and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

**KELLS & SONS, Adrian, Mich.**

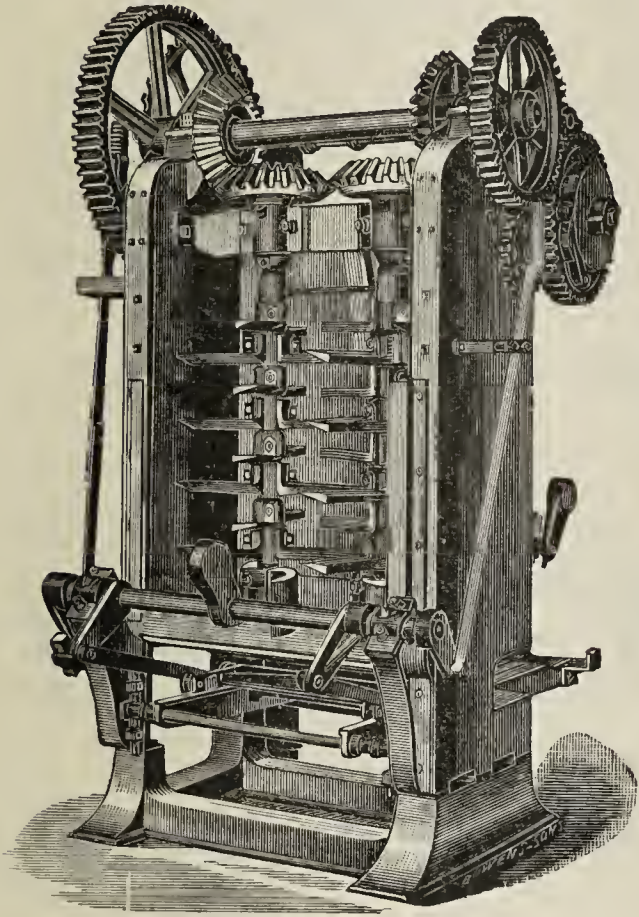
## H. C. BAIRD & SON, PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.



# THE DUPLIX,

Is the Standard of all Soft Clay Brick Machines.



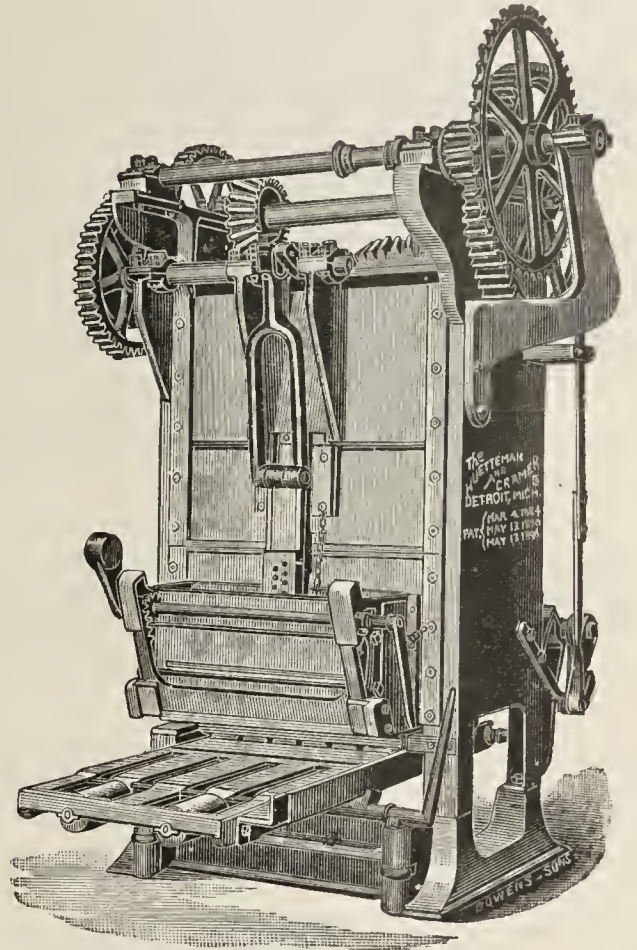
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE  
AND PRICES TO

The Huetteman  
& Cramer Co.,

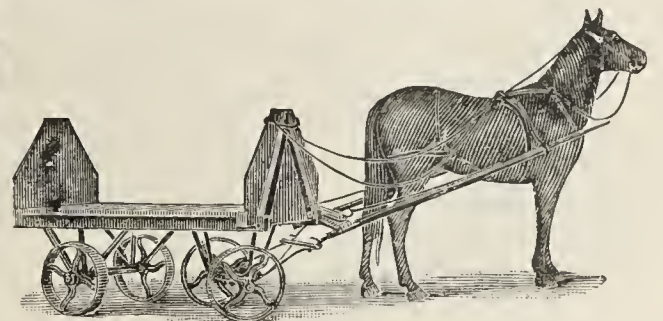
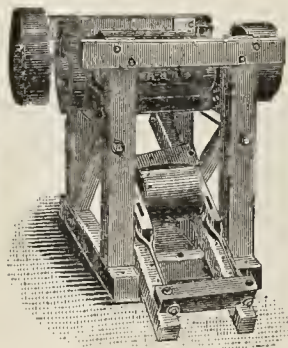
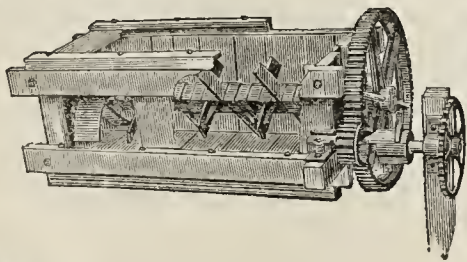
Manufacturers of the Duplex Brick Machine and general outfit for  
brickyards,

12, 14 & 16 Sherman St.,  
DETROIT, - - MICH.



## Everything

A Brickmaker Needs are  
our Specialties.



THE

## Henry Martin Brick Machine Mfg. Co.,

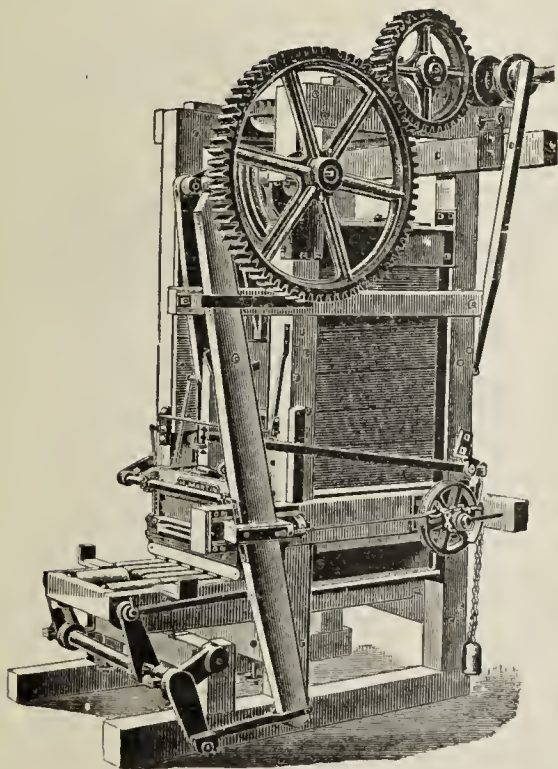
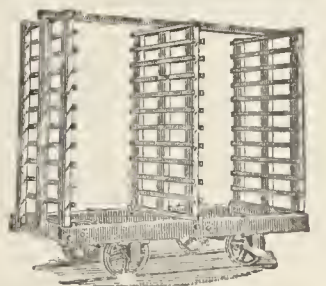
Incorporated.

Lancaster, Pa., U. S. A.

CABLE ADDRESS "MARTIN LANCASTER," LIEBER CODE USED.

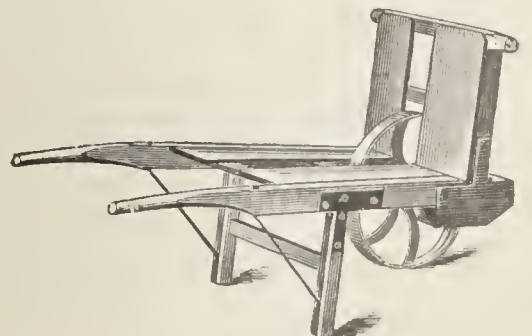
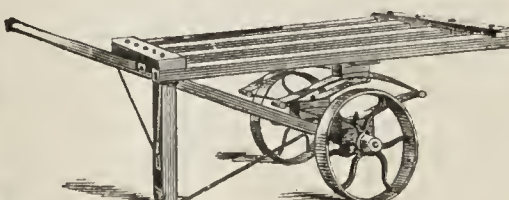
**BEFORE** Placing your orders for any Brick  
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Machine Moulds at greatly reduced prices.

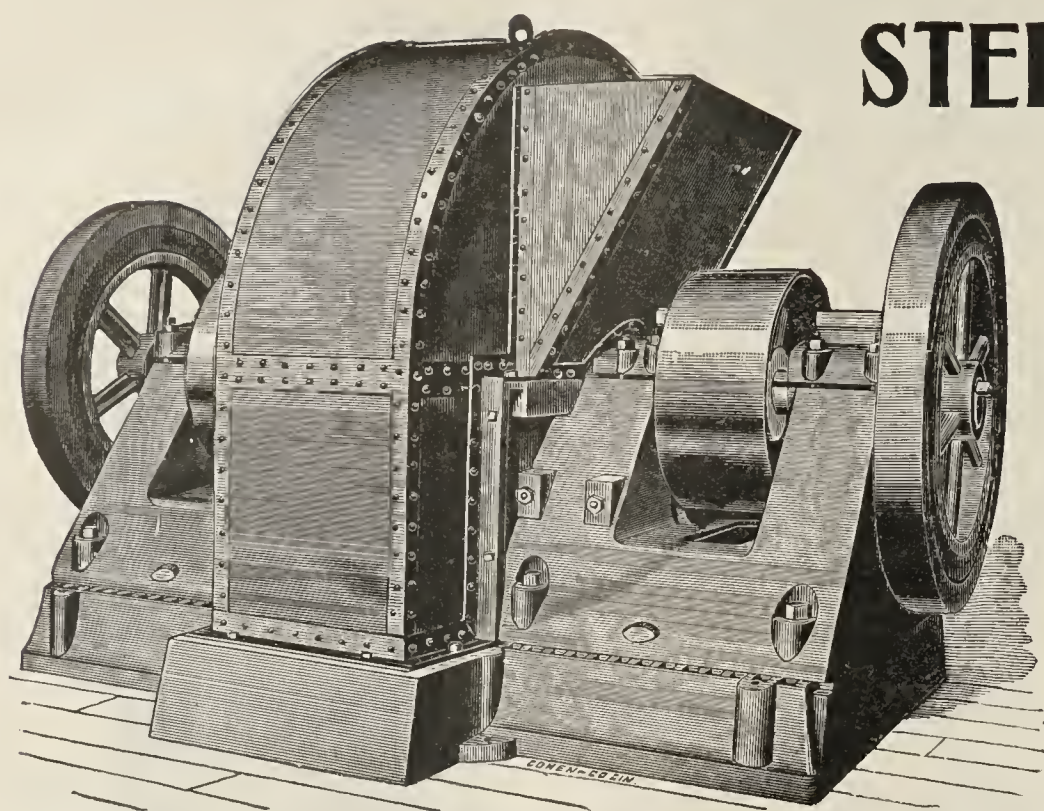


MARTIN'S "A"

Steam Power Brick Machine.  
Capacity 50,000 per day.







## STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly  
Pulverizing Clay in a  
Dry, Semi-Dry or  
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,  
Aurora, Ind.

## The "New South" Brick Machinery

Manufactured by

**J. C. STEELE & SONS,**  
Statesville, N. C.

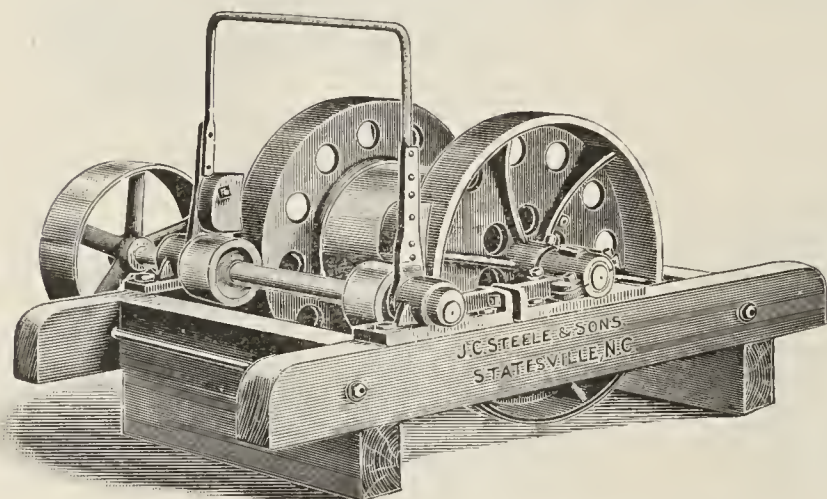
...

Twenty-four outfits of Brick Machinery sold in six months, besides many of our new Double Friction Winding Drums (of which cut is here shown,) and lots of our Iron Frame Revolving Clay Cars, not to mention Brick Trucks, Automatic Cutters and other Brickyard equipments.

Let us make your acquaintance.

...

J. C. STEELE & SON, Statesville, N. C.



New Double Friction Winding Drum.

## The Standard Brick Machines,

MANUFACTURED BY

**A. M. & W. H. WILES CO.,**  
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

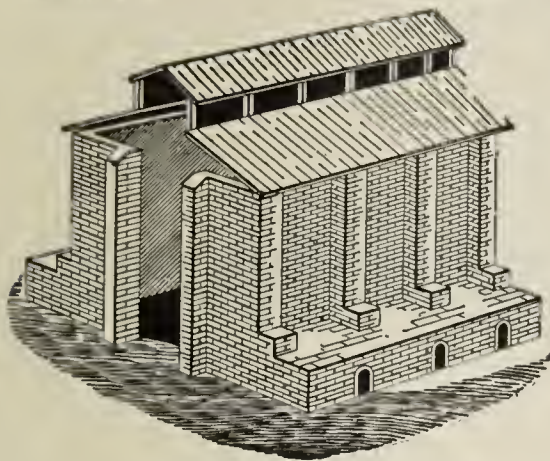
We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



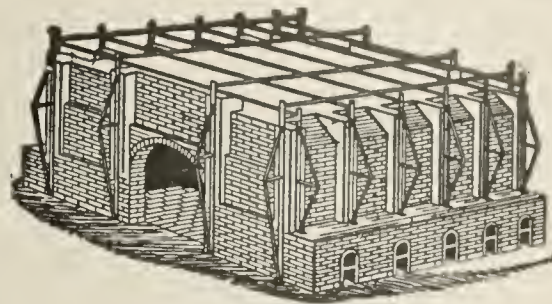
Mention the CLAY-WORKER  
WHEN WRITING TO ADVERTISERS,  
Mention the CLAY-WORKER.



Up-Draft Kiln.

## LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.  
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

**LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.**

# The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

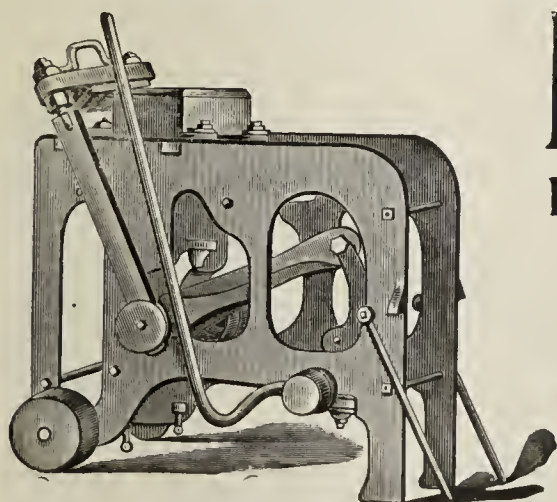
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

*Days Brick Works.*

**BELLEVILLE, ILL.**



RED BRICK PRESS.

**GEORGE CARNELL,**

Nos. 1,819, 1,821 and 1,823 Germantown  
Avenue and Fifth Street,

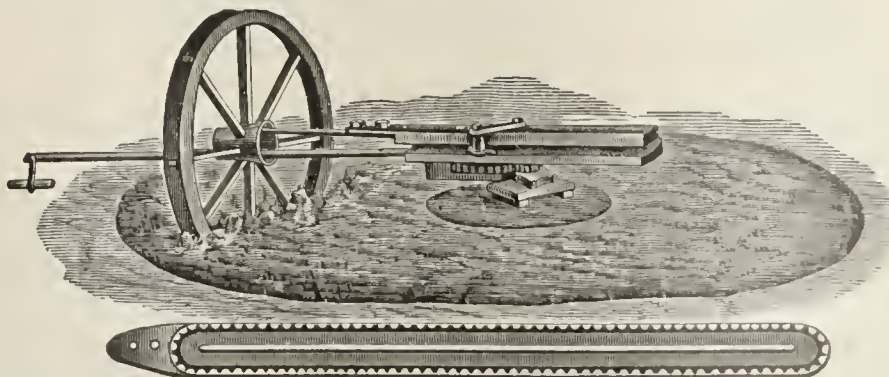
PHILADELPHIA, - - - PENN.

## PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.



# HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



WOULD like to show you also my new Kiln Floor for Round or Square Down-draft Kilns. It is a permanent floor, to any one who has to use sand in sanding their brick it is a money saver, a floor can be cleaned in two hours without moving any brick; and fuel is saved in the burning of the product, and a great deal of annoyance saved in releveling etc., for dry pressed and other high grades of brick.

Address **H. HAIGH, Catskill, N. Y.**

## The Lehmann <sup>Portable Continuous</sup> Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

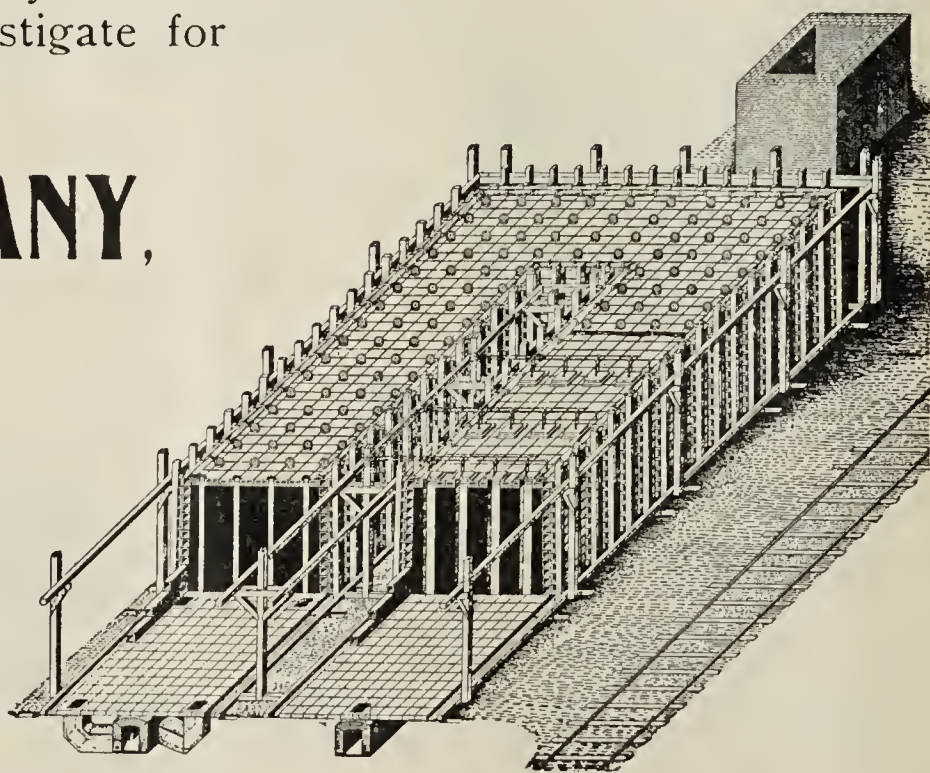
### F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,  
Plans and estimates furnished for Brick, Lime and  
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.





# Morrison's Latest

## Improved Kiln,

### FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

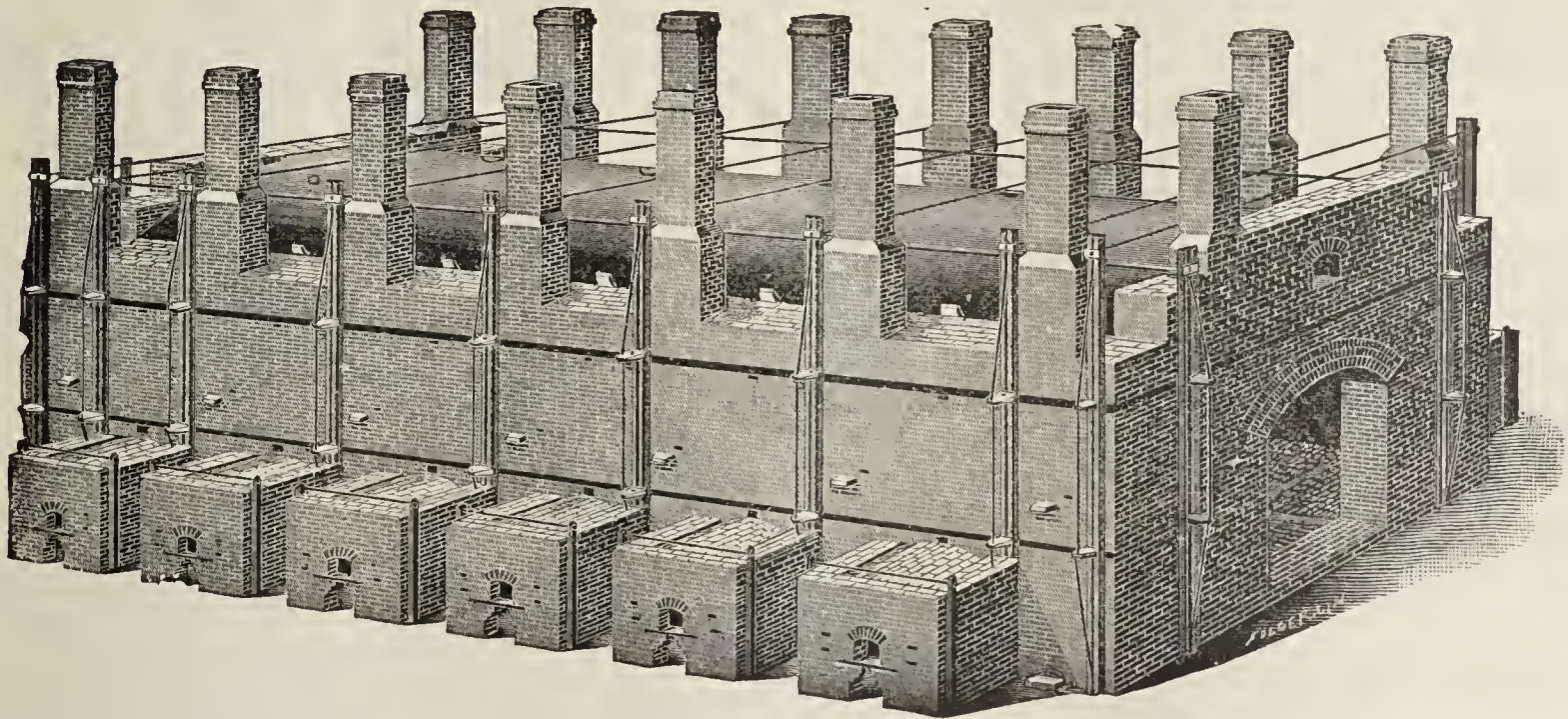
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

## The EUDALY

IMPROVED —  
DOWN-DRAFT KILN  
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

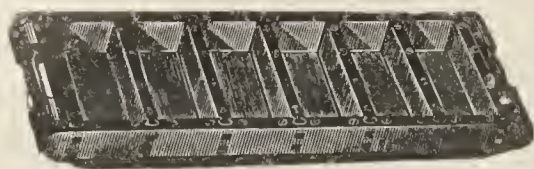
We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

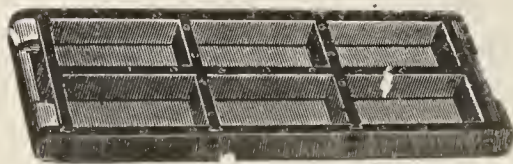
**W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.**



# Do YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see!"

We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

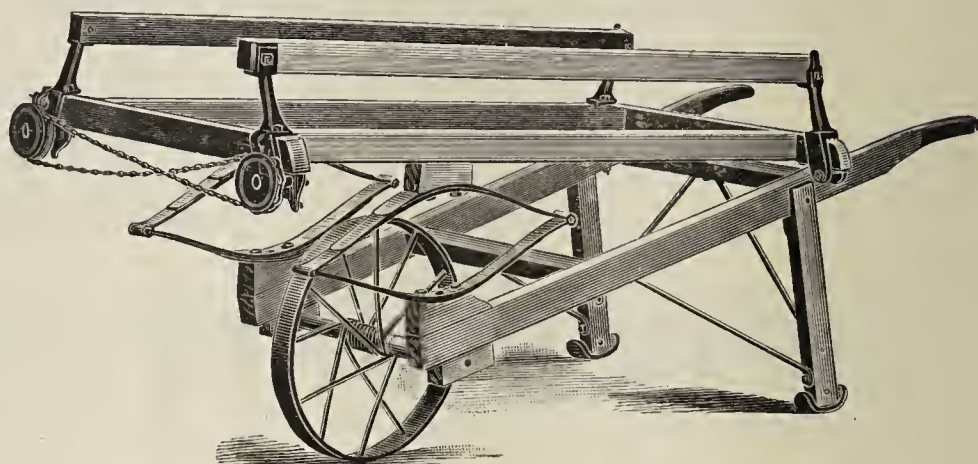
future delivery desired now. We make the best

➔ Moulds, Trucks  
and Barrows,

A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00  
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

## The Past and the Future



## In the Past

# Cutting

## BICYCLES.

Have given universal satisfaction.

In the Future we agree to protect you by our liberal guarantee.

Six models to select from \$35, \$45, \$60.

We refer by permission to the editor of the CLAY-WORKER.

Get our Catalogue.

These wheels are fitted with gear cases and the Willits Rear Hub Brake.

A full line of Cycle Sundries.

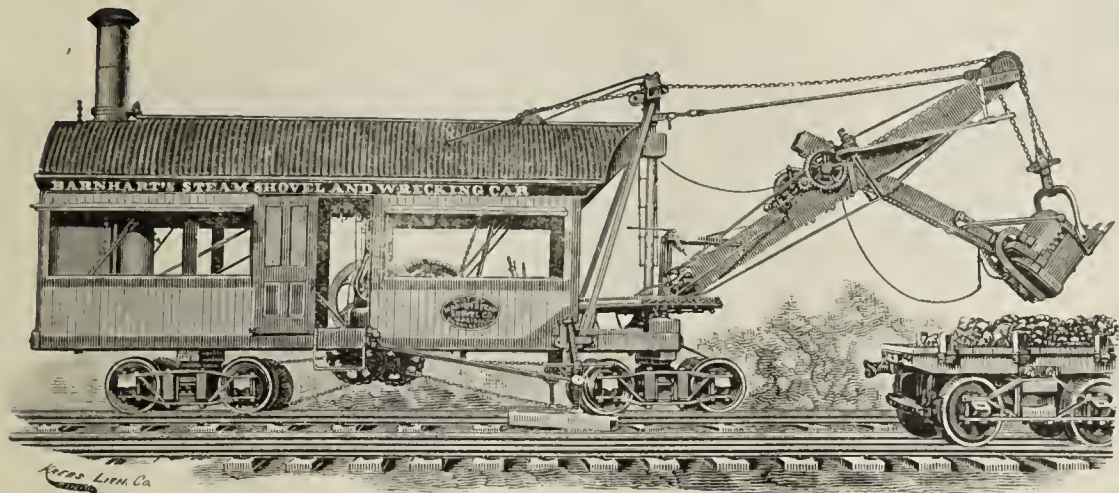
Get our Sundry Catalogue.

# HAY & WILLITS MFG. CO.

West 18th St. and Belt Railroad, INDIANAPOLIS, IND.



# Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

**The Marion Steam Shovel Co.,**

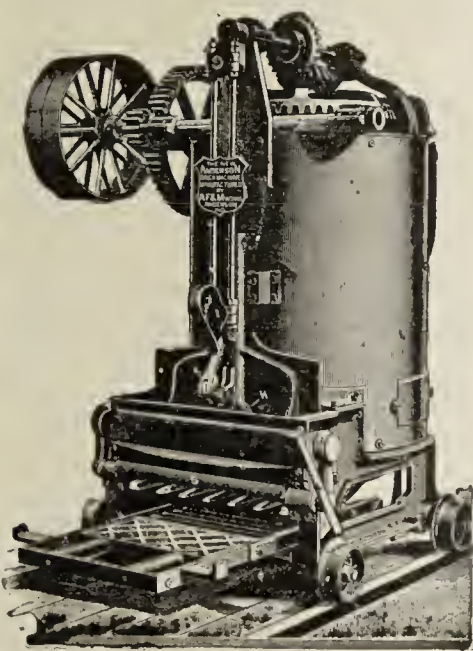
603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

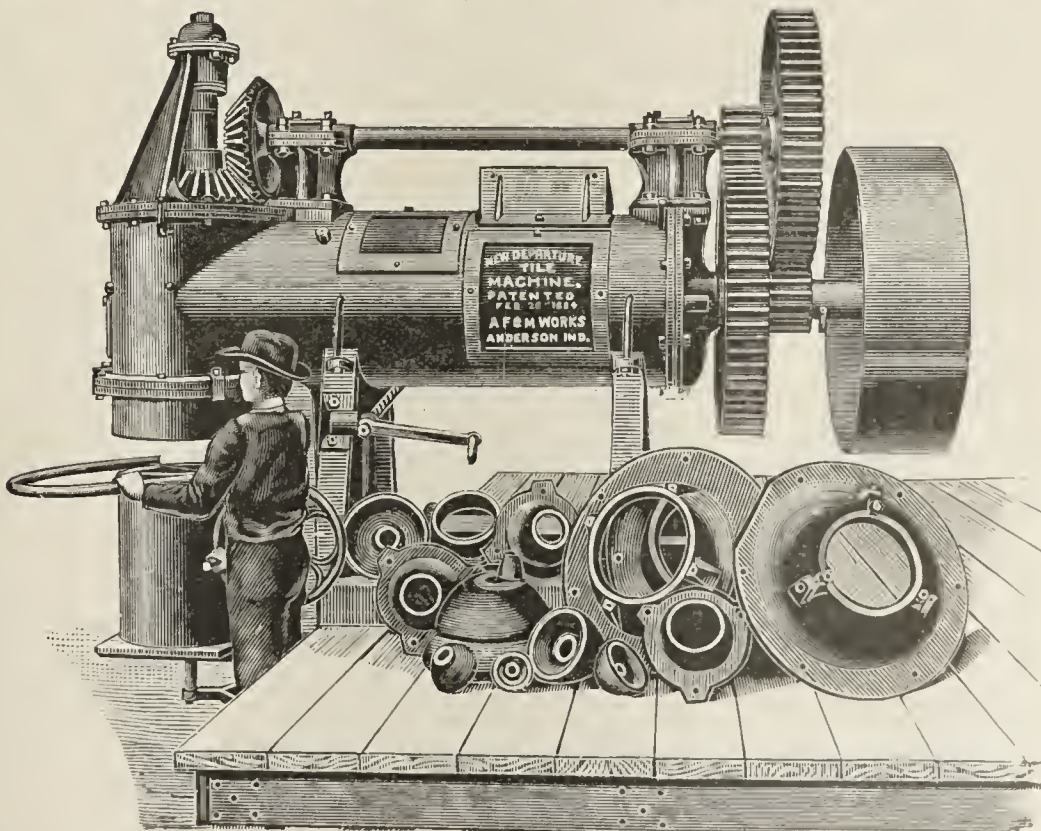
# New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.  
Steam Power.

Write  
for  
Catalogue  
and  
Prices.

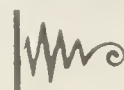


NEW DEPARTURE TILE MILL.



**The New Departure Tile Mill.**

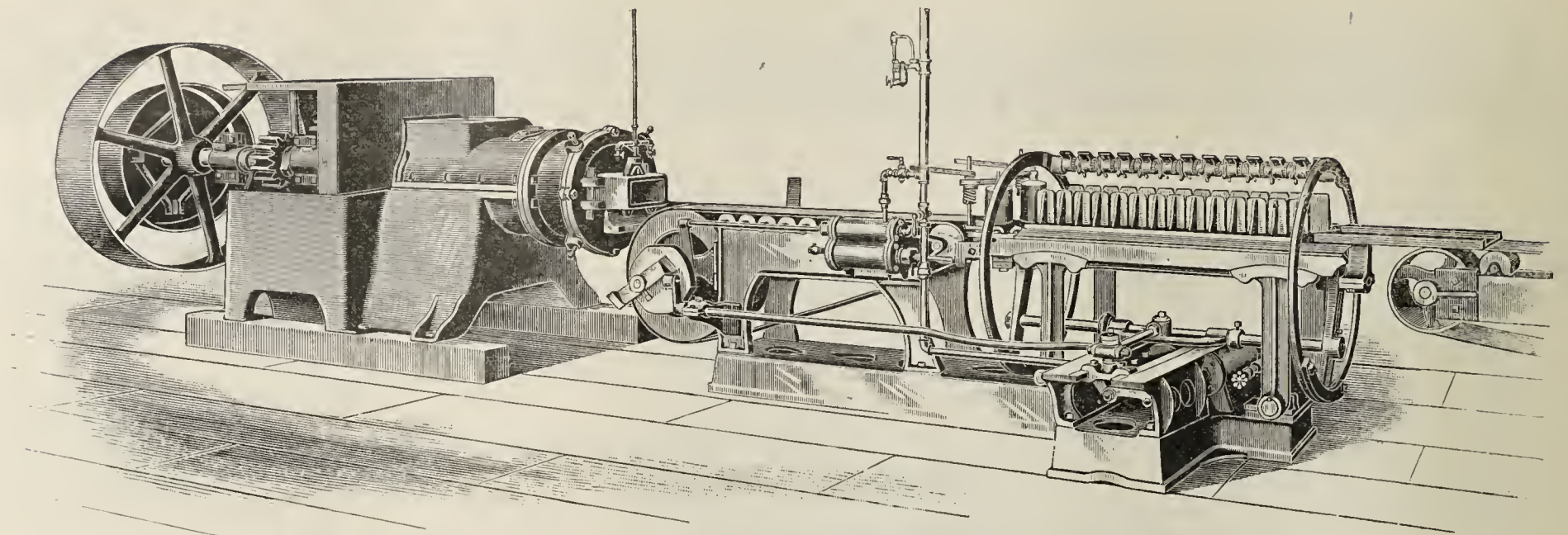
The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.



**THE ANDERSON FOUNDRY & MACHINE WORKS,**

**Anderson, Indiana**





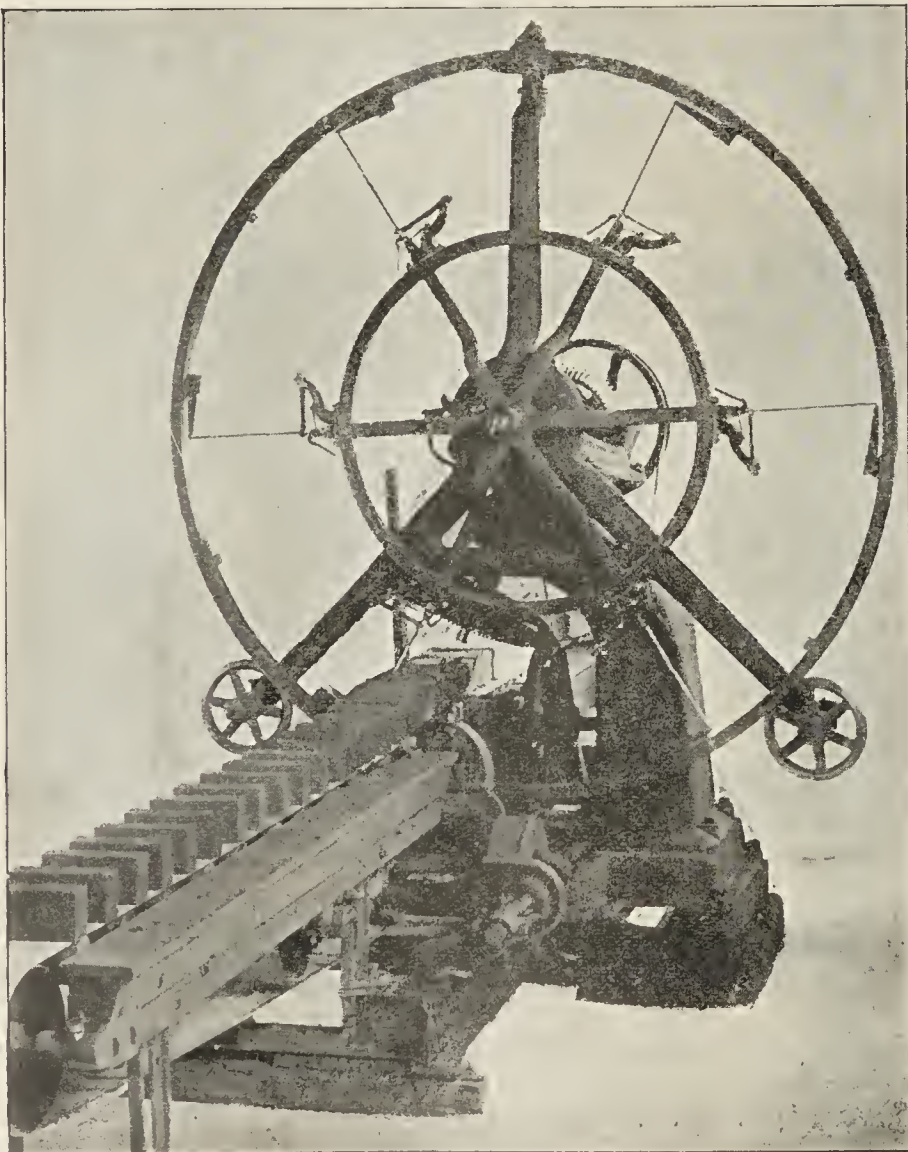
## LEADER No. 25, With SIDE CUT DIE and ..... AUTOMATIC CUTTER.

This machine has been sold throughout the United States during the last nine years and continues to give the best of satisfaction. It has been re-designed and increased in weight without omitting any of the valuable features of the original, has roller feeder, friction clutch pulley and is supplied with such dies and tables as are required. The maximum daily capacity is 30,000 common sized brick.

The side cut automatic cutter is something new and entirely original in that the work of moving the platen and of severing the brick is performed by steam cylinders, relieving the bar of clay of most of the work usually allotted to it and avoiding complicated machinery. This table is as certain in its operation and requires no more care, skill, or attention than an ordinary steam engine, has a capacity equal to any brick machine, and like the rest of our product, is sold on its merits.

Circulars of our complete line of brickmaking machinery free on application.

**LEADER MANUFACTURING CO., Decatur, Ill.**



The Chambers Automatic Side-Cutter.

### Automatic Side-Cutter For Stiff-Tempered Brick Machines.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

The machinery is above the dirt and all gearing encased.

MANUFACTURED and  
GUARANTEED. . . .

**Chambers Brothers Co.,**  
**PHILADELPHIA, PA.**





# JULY 4th.

## SOME OF OUR STARS!

|                                           |                                          |
|-------------------------------------------|------------------------------------------|
| Auger Brick Machines,                     | Elevator Boots,                          |
| Auger Tile Machines,                      | Fire Proofing Machines,                  |
| Automatic Brick Cutter and Separators,    | Granulating Pug Mills,                   |
| Automatic Tile Cutter and Separators,     | Hand Power Brick Presses,                |
| Barrows,                                  | Horse-Power Brick Machines,              |
| Board delivery Carriages for Hollow Ware, | Iron Work for Kilns,                     |
| Brick Dies, all kinds,                    | Lubricating Brick Dies,                  |
| Brick Re-Presses,                         | Ornamental Hollow Block Machines,        |
| Brick and Tile Trucks,                    | Platform Pipe Wagons,                    |
| Bucyrus Steam Tunnel Dryer,               | Plunger Brick Machines,                  |
| Buffing Machines,                         | Plunger Tile Machines,                   |
| Combined Auger Machine and Pug Mills,     | Power Transmitting Machinery,            |
| Clay Disintegrators,                      | Press Brick Machines,                    |
| Clay Granulators,                         | Pug Mills,                               |
| Clay Steamers,                            | Roofing Tile Machines,                   |
| Corrugated Crushers and Separators,       | Reduction Mills,                         |
| Clay Grinding Machines                    | Revolving Dump Tables                    |
| Disintegrators and Crushers combined.     | Sewer Pipe Presses,                      |
| Double-Working steam Presses,             | Sizing Machines,                         |
| Dry Cars,                                 | Terra Cotta Machines,                    |
| Dry Pans,                                 | Transfer Cars,                           |
| Dump Cars,                                | Turn Tables,                             |
| Elevators,                                | Upright Stock, Sand Mold Brick Machines, |
|                                           | Wet Pans,                                |
|                                           | Winding Drums.                           |

Write us for Special Machinery and Prices.  
Correspondence Solicited.

On July 4th the heart of the average American swells with patriotic pride. He looks back upon the proud record of the country, its achievements, its growth, its grandeur and his bosom swells with patriotism, his heart is merry with the knowledge of deeds well done. Patriotism is a good thing. "Honor to whom honor is due" is a just maxim. Every American should rejoice on July 4th, but there are thousands of clayworkers all over the country who have cause to rejoice daily over the achievements of THE AMERICAN CLAY-WORKING MACHINERY COMPANY. It has revolutionized the art of brick and tile making, has placed in the hands the clayworker the tools and appliances best suited for his purpose. It has combined the true principals of correct machinery with quality of material and faultlessness of construction. No machine is allowed to go out unless it will fill perfectly the purpose for which it was built. These principals have built up a record for THE AMERICAN COMPANY almost equal to the American Nation. If you are in the market for Dry Press, Stiff Mud or Soft Mud Machinery write for information concerning the celebrated "Built Right, Run Right" kind. We fill every want of the clayworker and fill it to his entire satisfaction. Write to-day to-morrow never comes.

## The American Clay-Working Machinery Company,

BUCYRUS, OHIO, U. S. A.

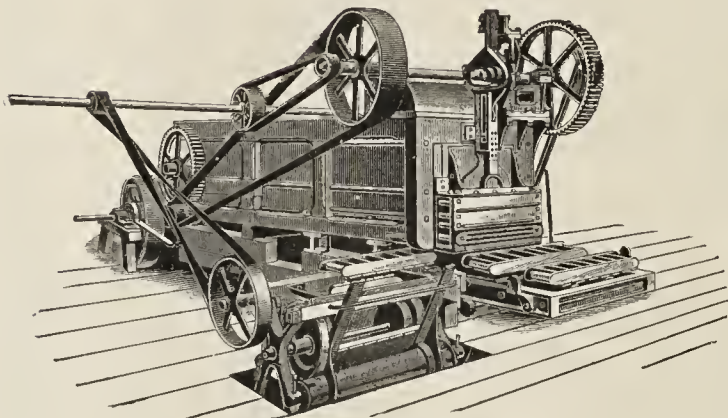


# DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

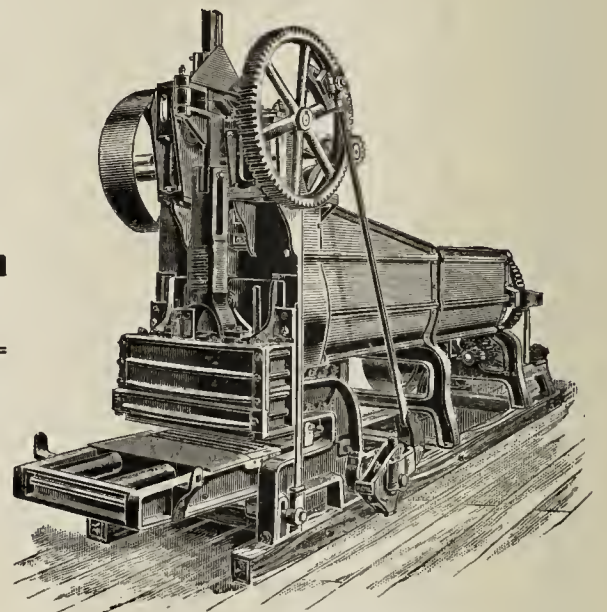
..THE..  
**POTTS** Horizontal Stock  
 Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

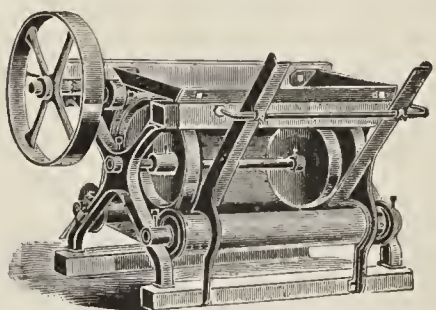
They have no equal  
 for making Brick which  
 have Clean, Sharp Cor-  
 ners and Smooth  
 Surfaces.



Iron Frame Pug Mill.

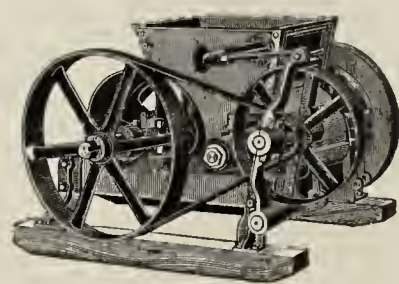
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



## Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



## Disintegrators,

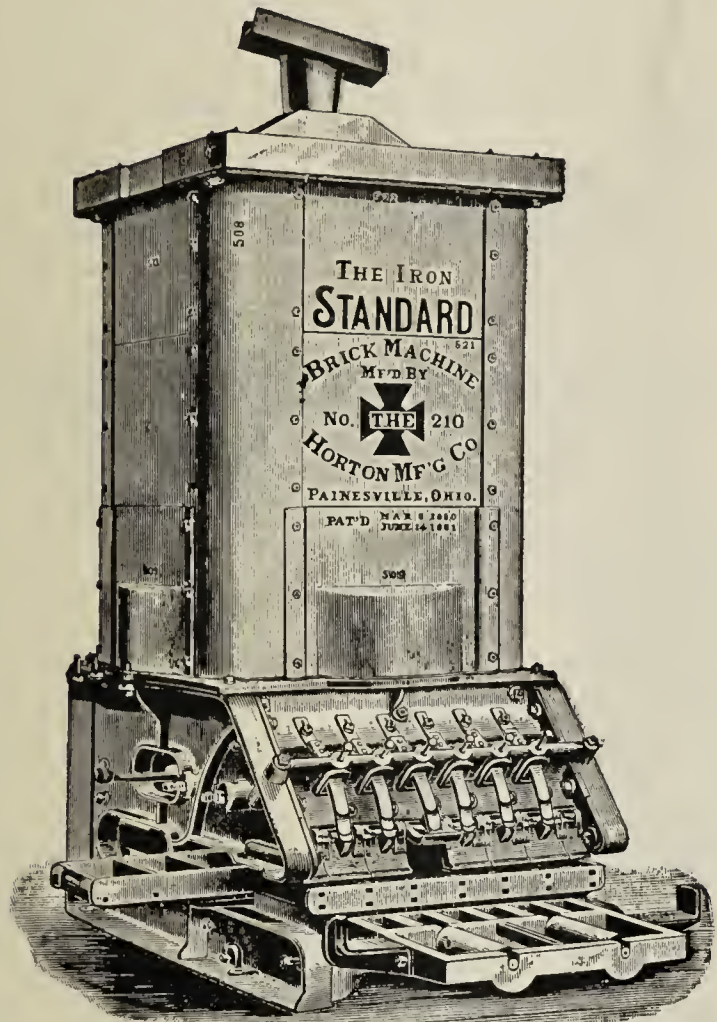
Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

**G. & A. POTTS & CO.,** 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**



# More Testimony.



IRON STANDARD HORSE POWER.

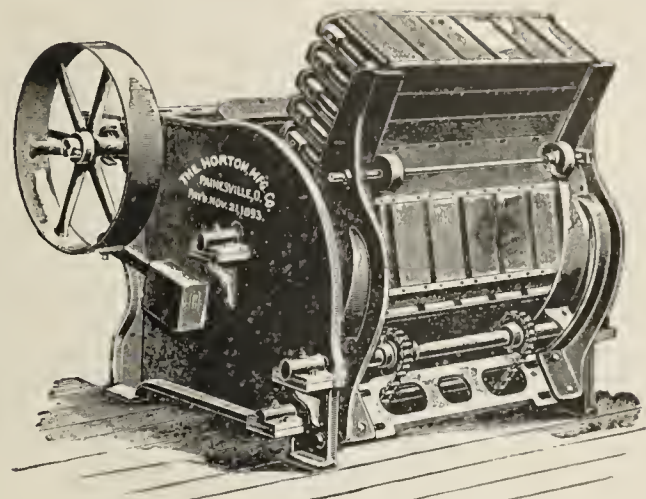
Des Moines, Ia., June 6th, '98.  
HORTON MFG. CO.,  
Painesville, Ohio.

Gentlemen:—Thinking you would be pleased to know how we are getting along with the Hercules and Mold Sander will say that we have been delayed somewhat on account of rainy weather this spring, hence could not run very steady, we wish to say that we are well pleased with the machine, she makes us nice square brick, we think the Hercules the best soft mud mill on the market.

The Sander is working fine, enclose find balance of settlement.

Yours respectfully,

MINEAR BROS.

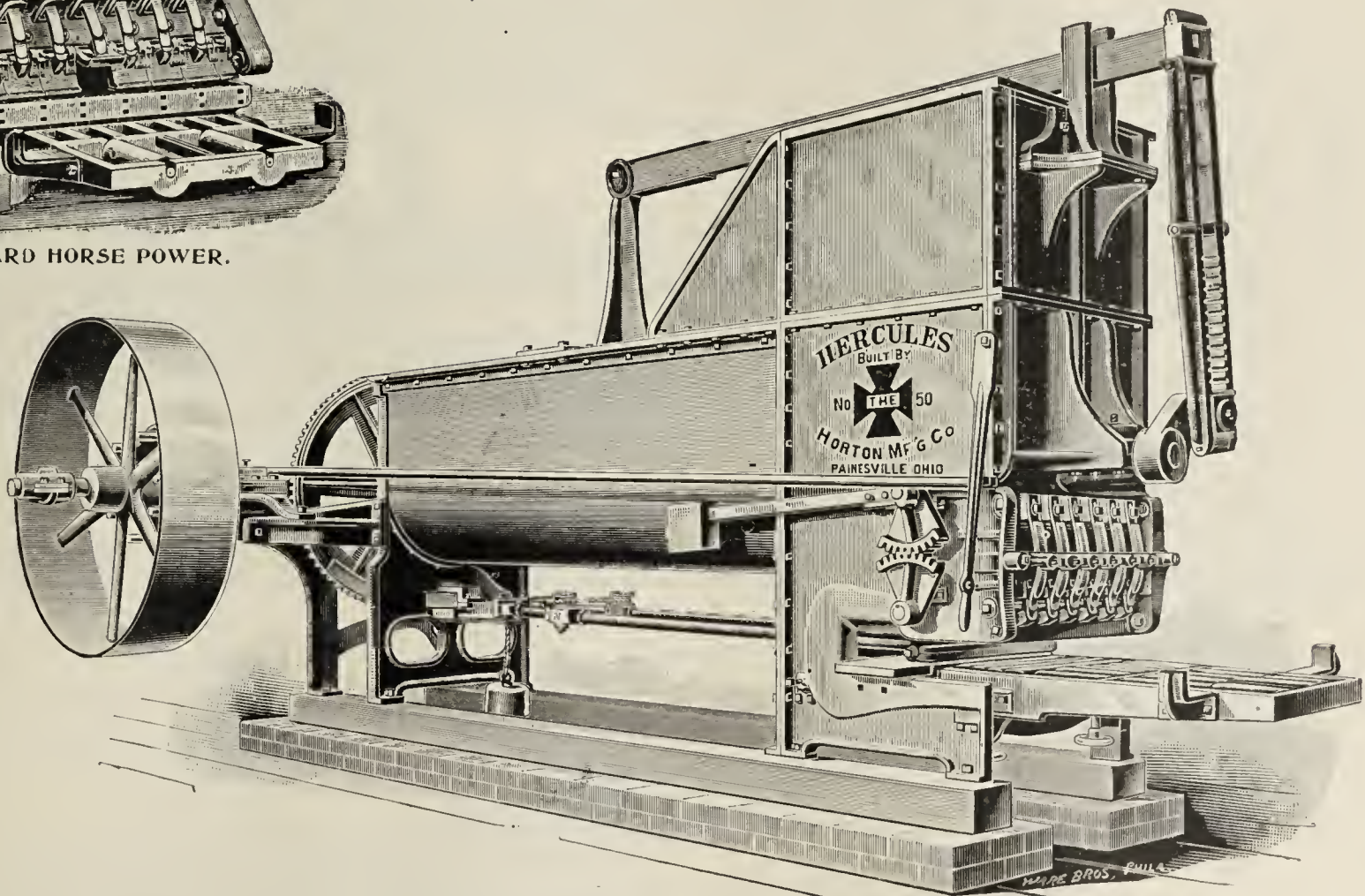


THE AUTOMATIC FEED MOLD SANDER.

Having refitted our Mold Department, we are prepared to make special prices.

## Hercules,

Capacity  
40,000 to  
50,000  
Ten hours.  
Weight  
7½ tons.



T. W. WHITE, Manager,  
**TENNESSEE BRICK COMPANY,**  
BRICK MANUFACTURERS,

No. 34 Madison Street.

OFFICE TELEPHONE, 1318.  
YARD TELEPHONE, 1135.

Memphis, Tenn., May 14, 1898.

HORTON MFG. CO., Painesville, Ohio.

Gentlemen:—Thinking that you would like to know how the "Hercules" machine, recently purchased of you by this company is working, will say that I am pleased to inform you that the machine is doing good service, we have made near a million of brick per month, and the machine is working nicely. "The more we work it the better we like it." If there is any one in this section of the country who wishes to see it work you can send them along and I will guarantee they will go away perfectly satisfied that the Hercules machine is the best in the country.

The man who designed this machine certainly hit upon the right principle, and seemingly burned all bridges behind him and the chances for improvement does not seem possible and retain the simplicity in the marked degree which is shown.

I have been a brickmaker all my life and for the past 27 years I have been operating various machines and I say frankly that the Hercules is by all odds the simplest and the best machine I ever saw. The mold device is simply perfect. The capacity of the machine is limited only by the party operating it, it can make all the brick that can be taken away from it. We frequently make 4,000 per hour. It is the lightest running machine I ever saw. No trouble in slipping belts. I would rather pay \$1000 for this machine than to have nine-tenths of the other machines as a gift.

Yours truly,

HARRISON McQUE, Superintendent.

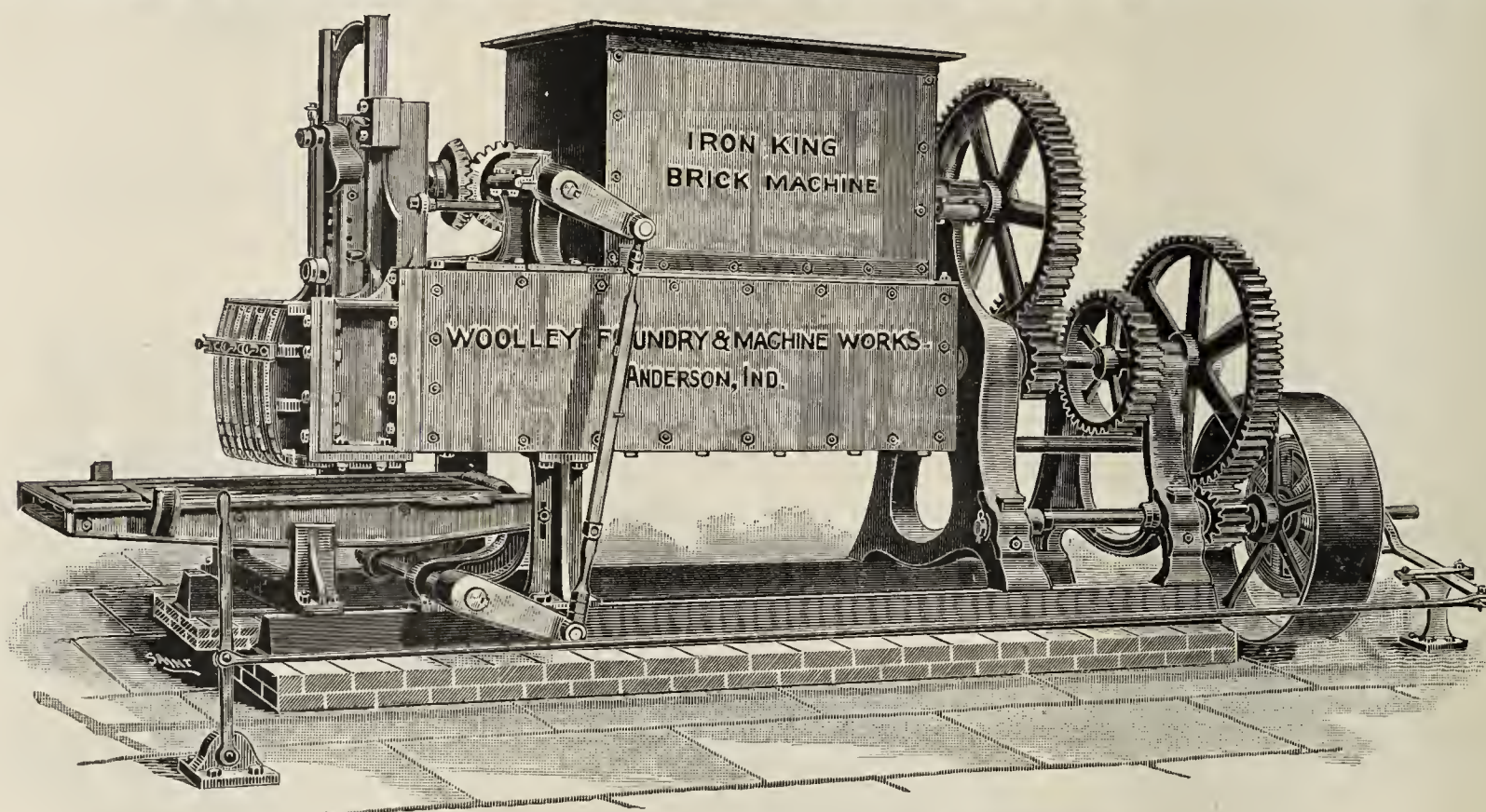
**Horton Manufacturing Co., = Painesville, Ohio.**



# SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our "IRON KING" Brick Machine is made on correct mechanical lines and of material that will "stand the racket" right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

**WOOLLEY** DRY PANS,  
PUG MILLS,  
SLIP PUMPS  
and PRESSES

Are all made for hard service If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

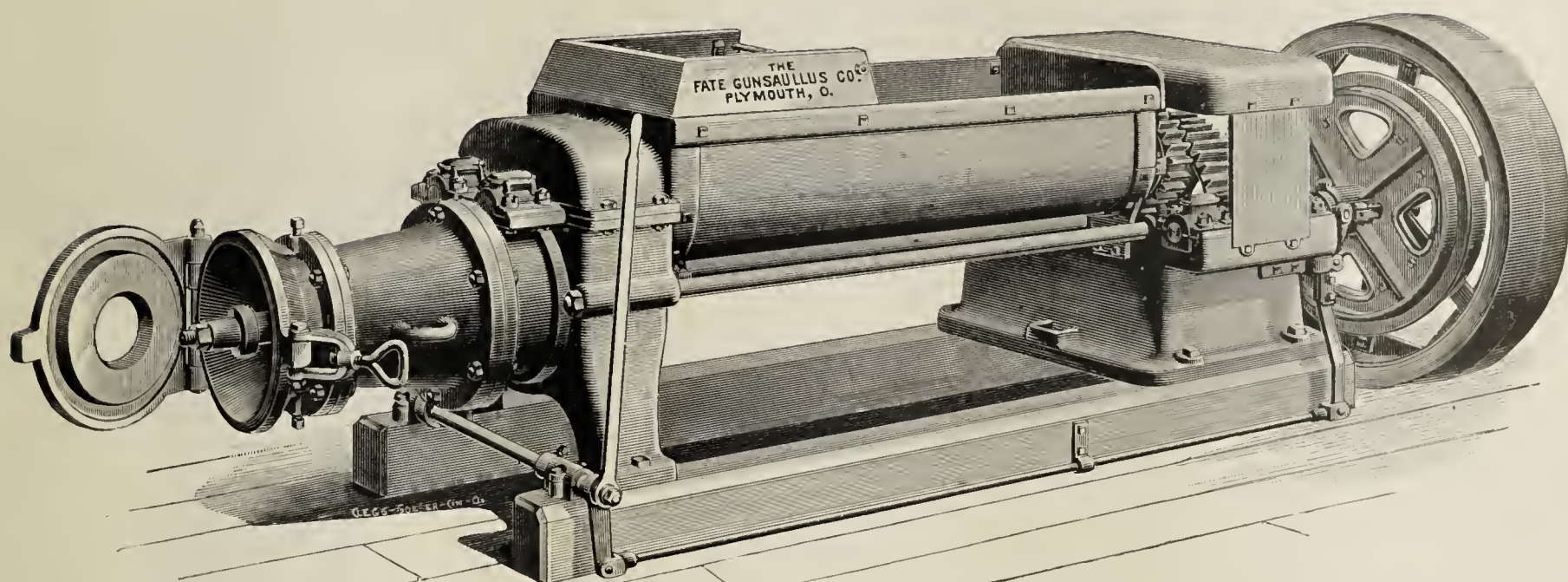
IT WILL AFFORD US  
PLEASURE TO QUOTE  
YOU PRICES. . . .

Mention the Clay-Worker.

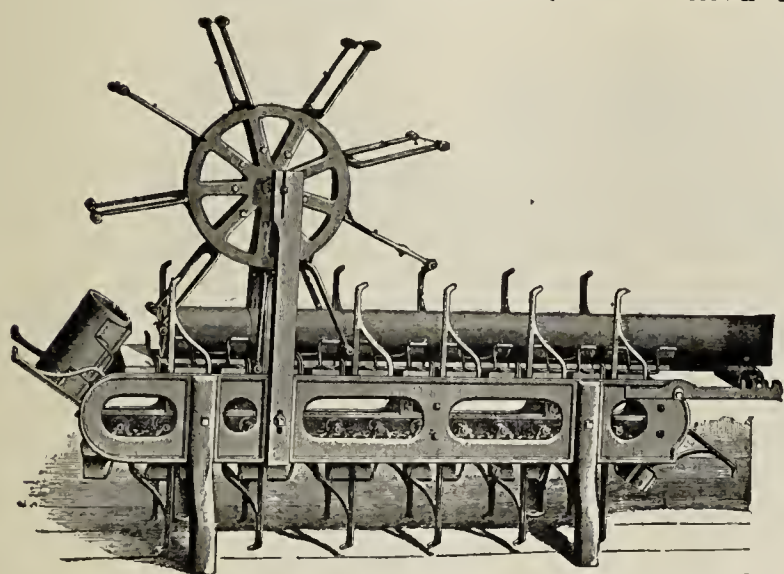




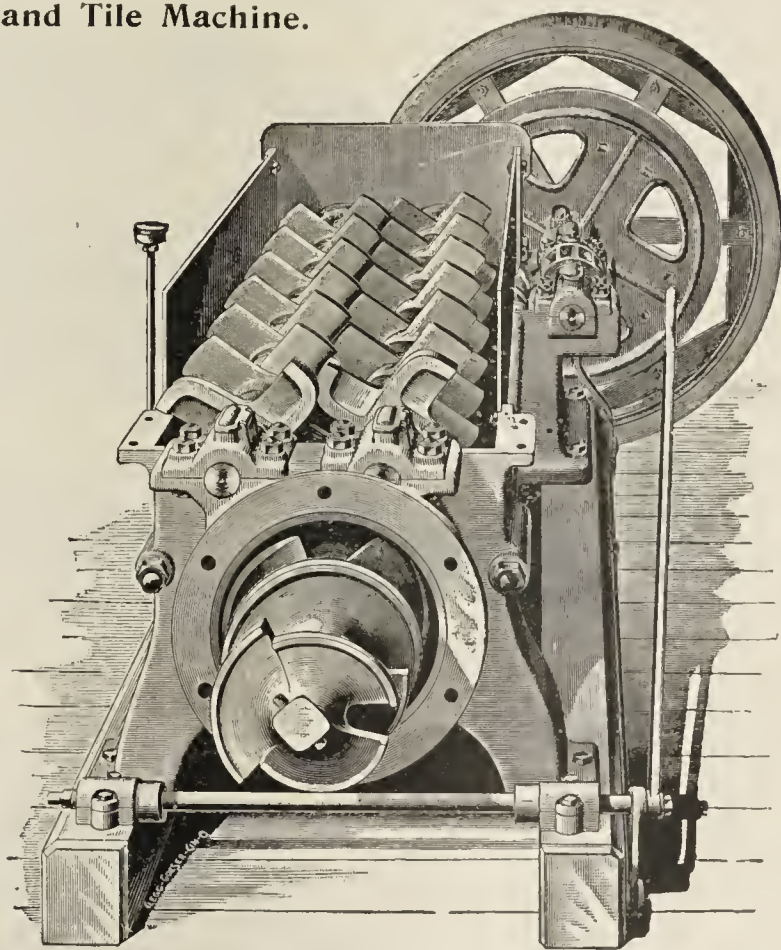
# The "PLYMOUTH."



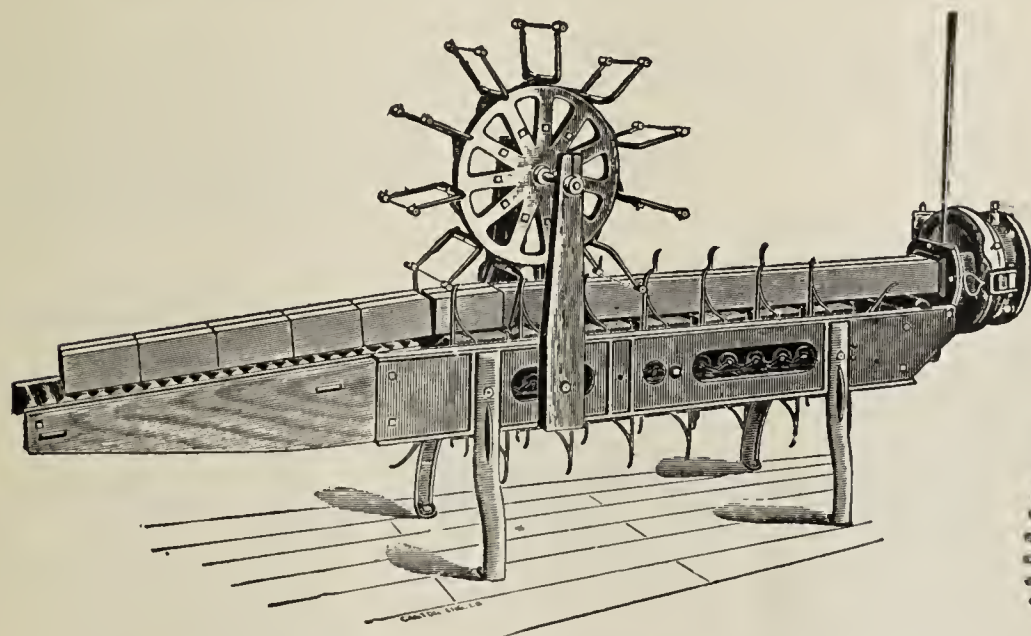
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



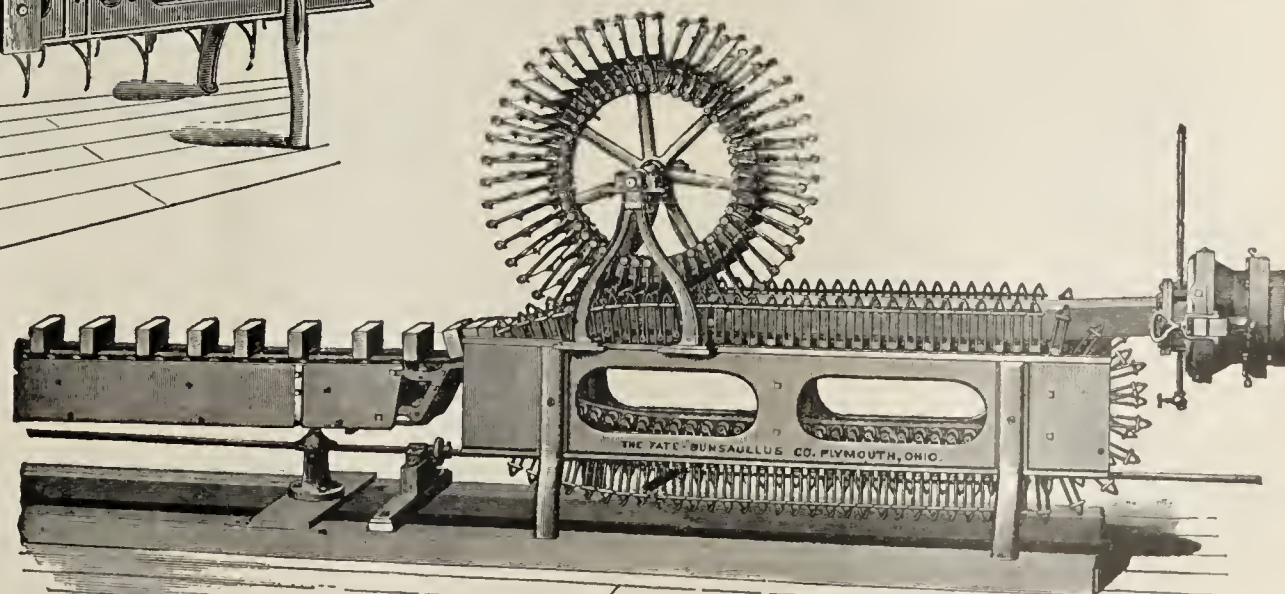
Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



"HUMMER" (Interior View.)



Automatic End-Cut Brick Table.



Automatic Side-Cut Brick Table.

Write for particulars to

**J. D. Fate & Co.,**

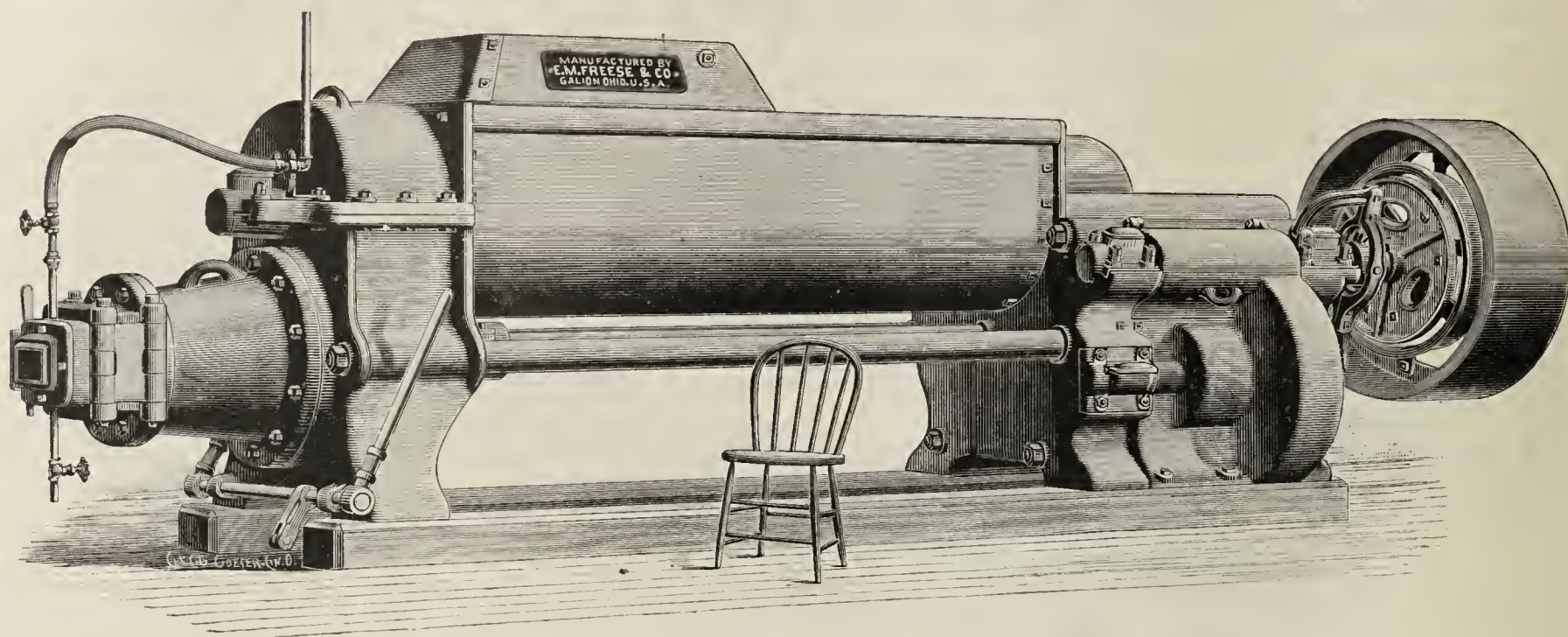
PLYMOUTH,  
Richland County, OHIO.

**B. E. LaDow,**

Special Western Representative,  
406 Chamber of Commerce Bldg., CHICAGO, ILL.

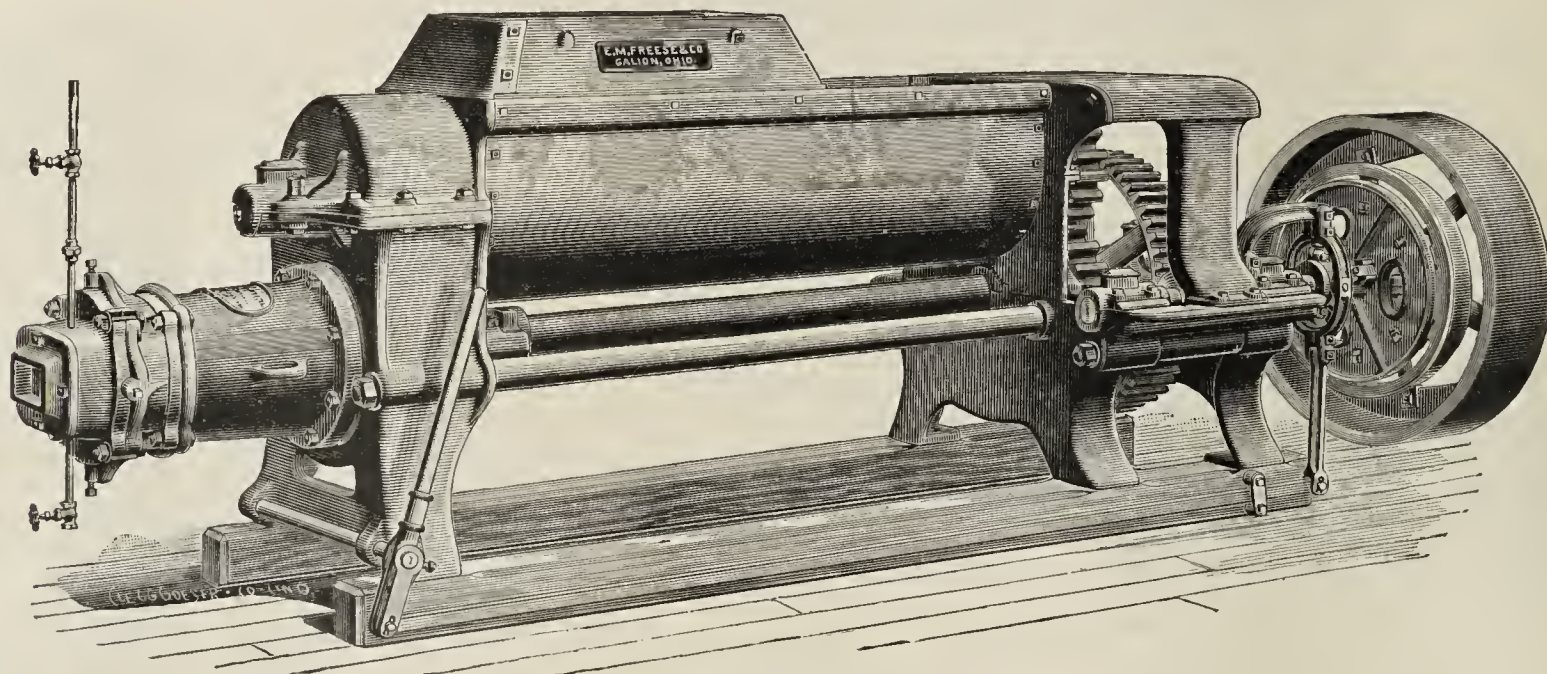


# The Original Union Brick Machines



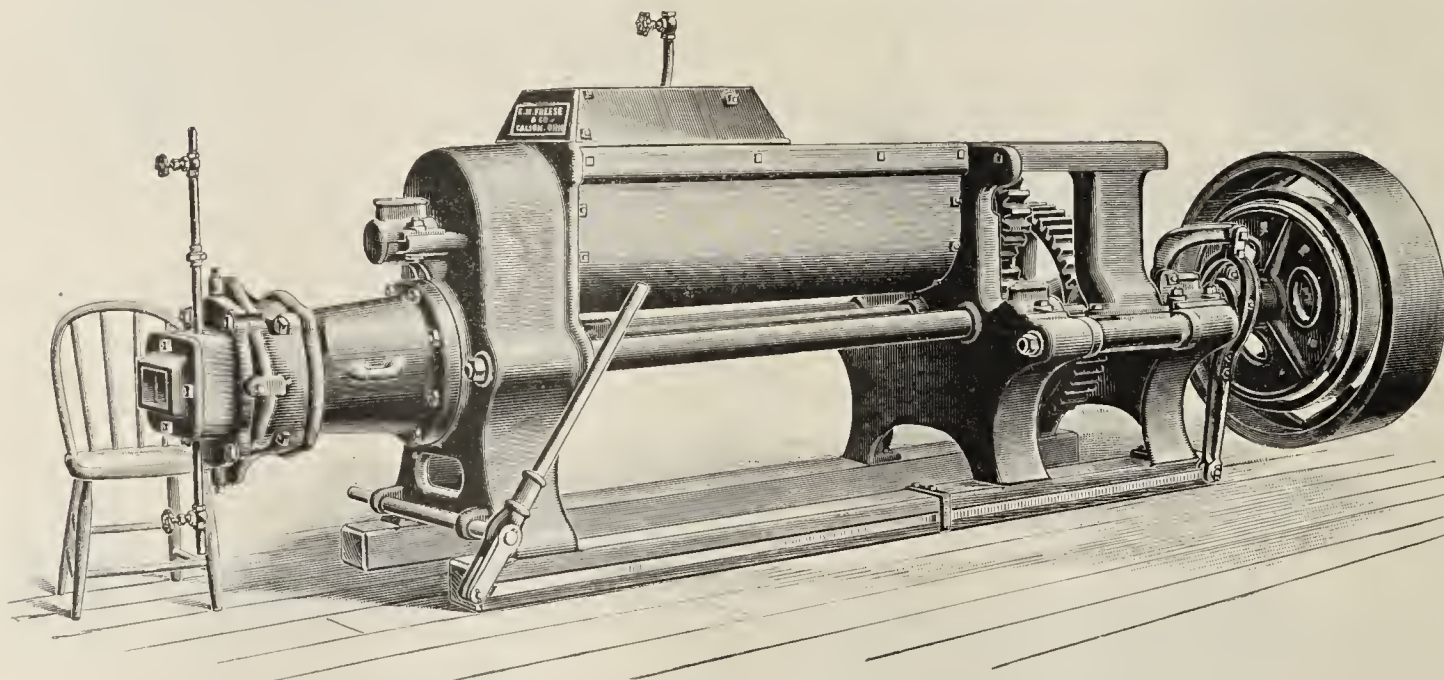
## SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



## No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



## No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

**E. M. FREESE & CO., Galion, Ohio.**

These Machines are  
NOT an experiment.

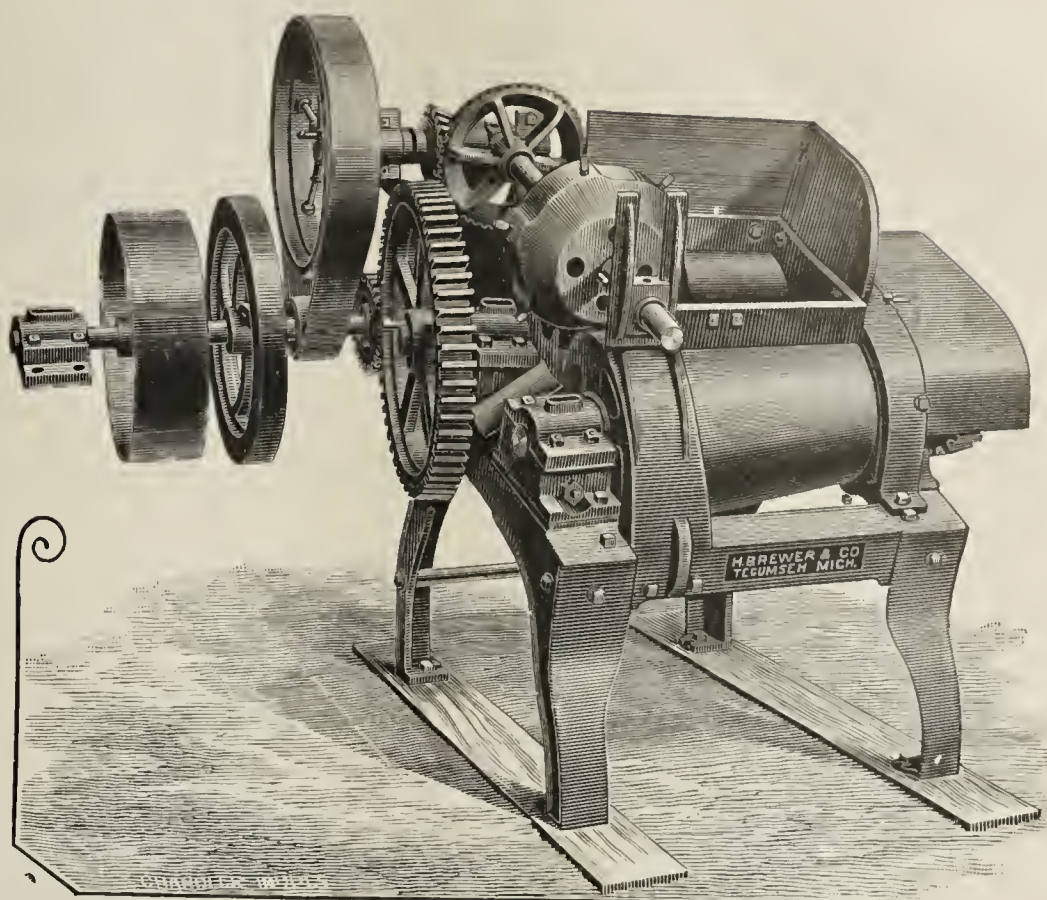
They are used in fif-  
teen States.

They are a SUCCESS  
Investigate them.

No separate Pug Mill  
required.

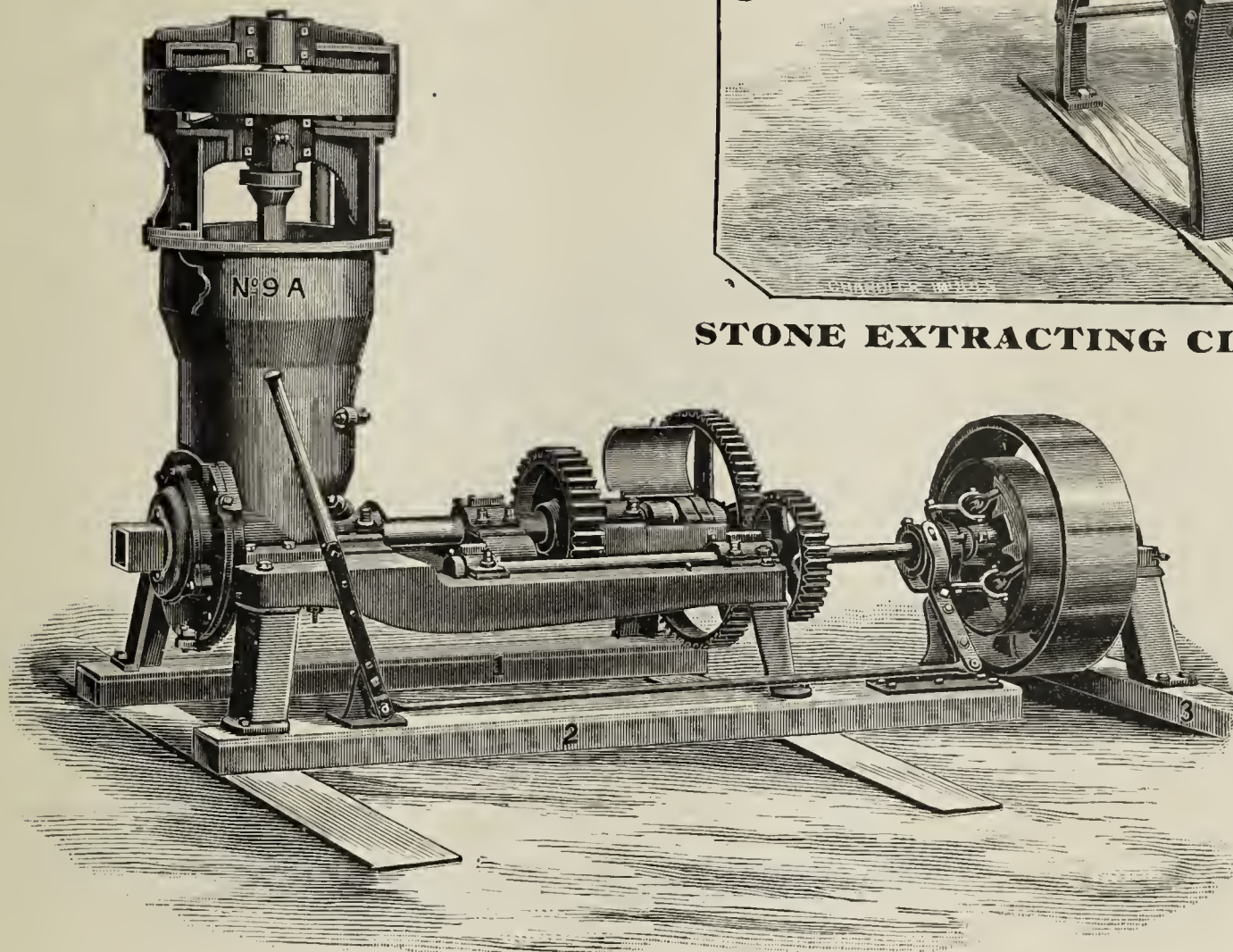


# Clay . . . . Working Machinery

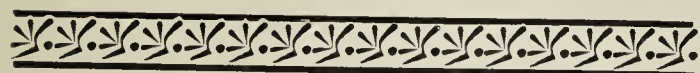


STONE EXTRACTING CLAY CRUSHER.

Complete  
Brick  
and  
Tile  
Outfits  
a Specialty.



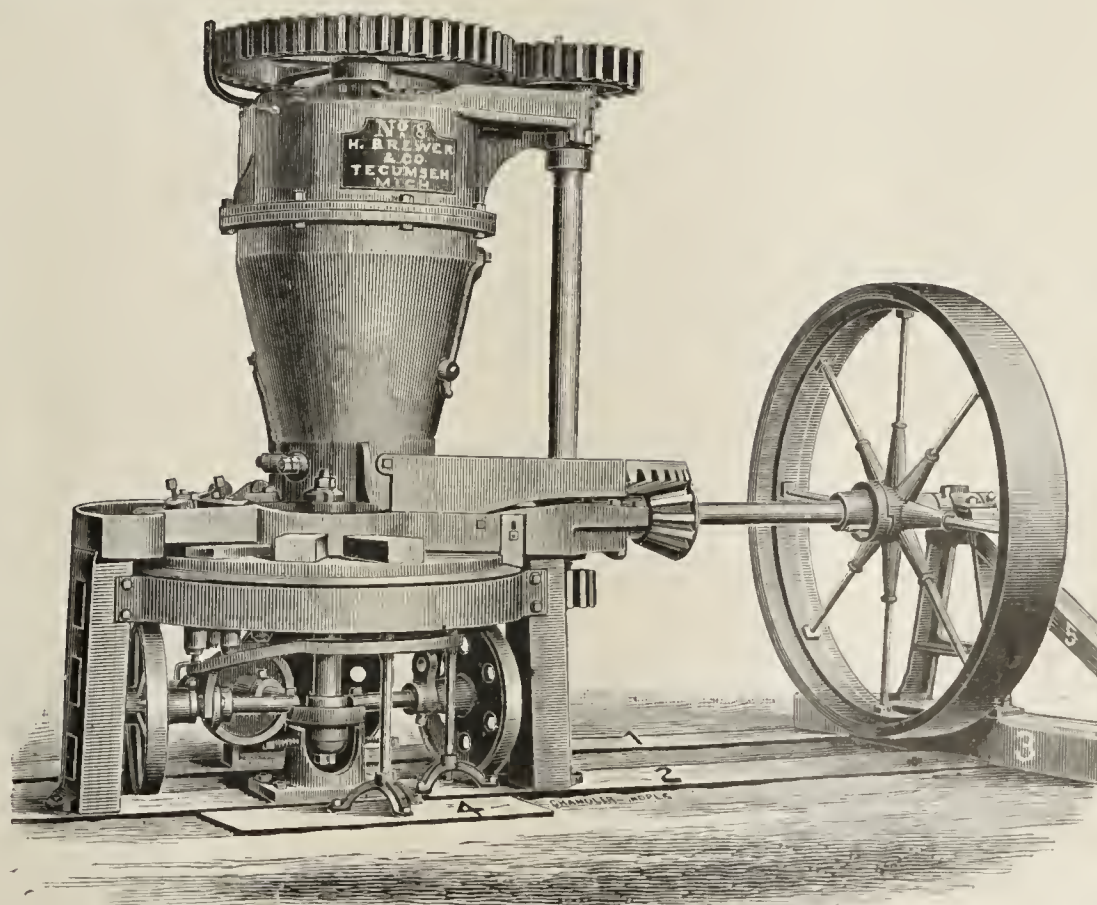
No. 9 "A" BRICK MACHINE.



Manufactured by

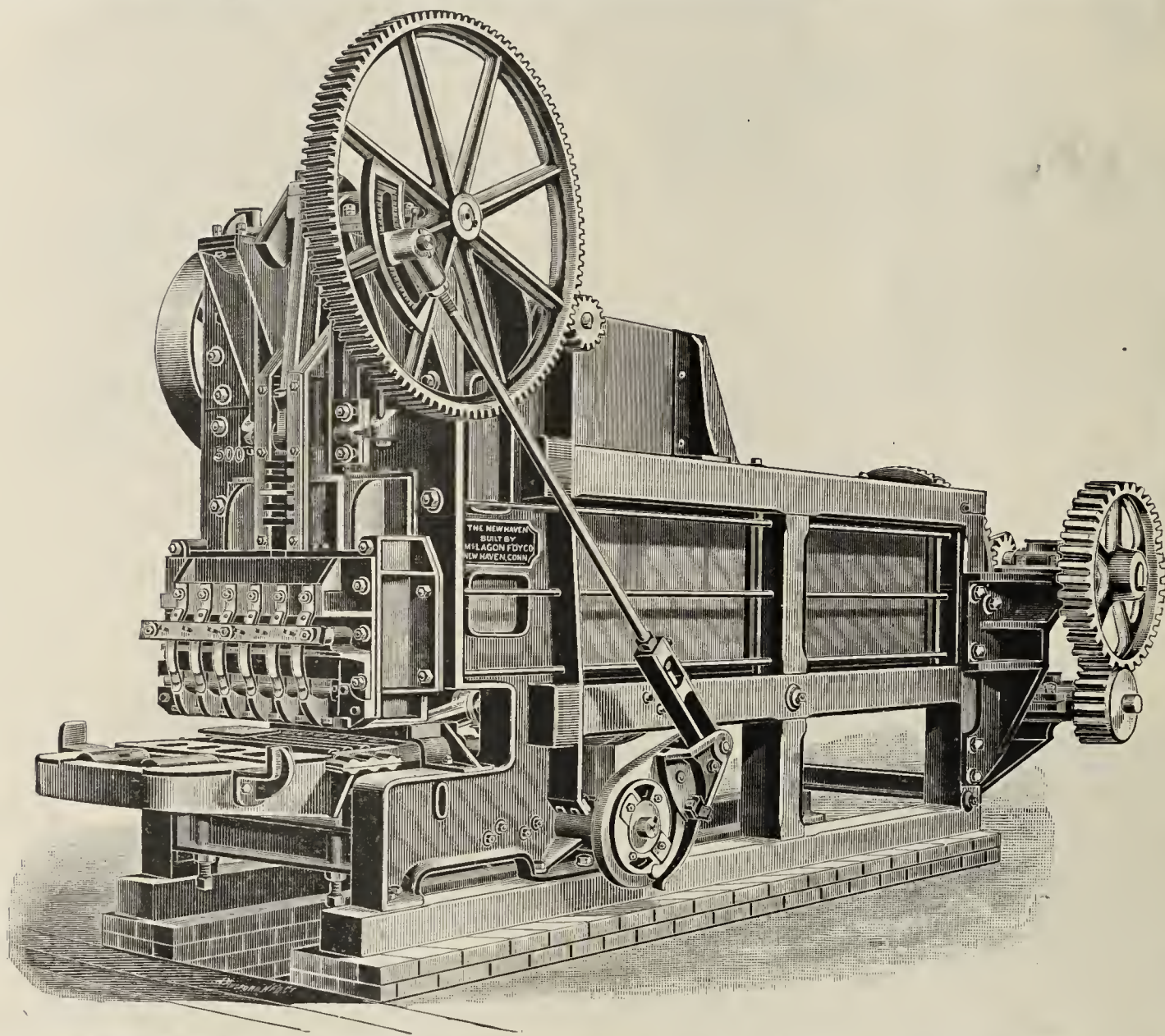
## H. Brewer & Co.,

TECUMSEH,  
. . . . MICH.





# End of Ninth Year.



Over  
Fifty=  
three  
Millions  
Made  
with  
this  
Machine  
in  
Nine  
Seasons.

NEW BRITAIN, CONN., Oct. 18, 1897.

THE EASTERN MACHINERY CO., New Haven, Conn.:

Gentlemen:—Would say that we should have answered your inquiry before now, but we did not get through making brick until a few days ago.

We **started early in April and have turned out six and one-quarter million** brick, and we have not lost one hour's time on account of repairs.

I think your machine is an excellent one, and doubt if there is another one made that will stand the wear and tear for so long a time without causing the owner more expense and loss of time in making repairs.

We would highly recommend your machine to any brickmaker who is contemplating purchasing a new machine, and wishing you abundance of success, we are,

Yours very truly,

THE DONNELLY BRICK & TERRA COTTA CO.,  
M. H. DONNELLY, President.

No "New Haven" Machine has ever Failed to Give Results Like the Above.

## The Eastern Machinery Co.,

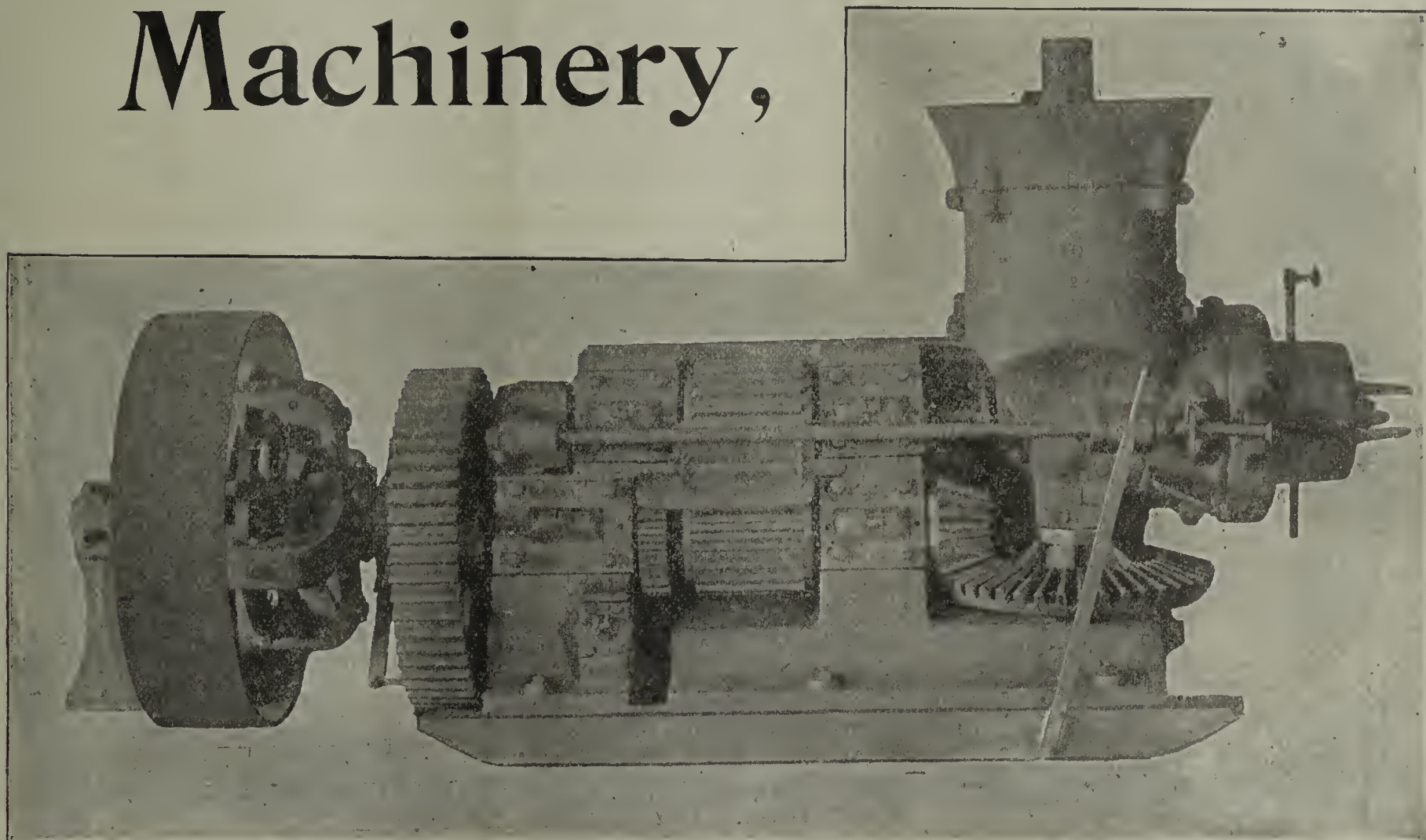
NEW HAVEN, CONN.



## What's in a Name?

A GREAT DEAL IF A THING BE WELL AND TRULY NAMED AND THIS IS TRUE OF

# Wonder Clayworking Machinery,



WHICH is so called because it has proven by actual work in various kinds of clays to have a **Wonderful** capacity, both for quantity and quality. It has a **Wonderful** pugging and tempering capacity and produces a **Wonderfully** strong brick, free from laminations, and in connection with our new automatic cutting table a **Wonderfully** straight, true brick is made of almost any clay. It is this **Wonderful** quality that enables our machinery to work successfully some clays which other auger machines can not work at all satisfactorily. This fact has been demonstrated time and time again. The users of **WONDER MACHINERY** all testify that it is well worthy of the name. They have demonstrated that it has **Wonderful** wearing qualities for which reason it is, in the long run, the best and cheapest machinery on the market.

It will afford us pleasure to send you testimonial letters attesting these facts and quote prices on individual machines or complete plants.

---

## Wallace Manufacturing Co.,

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

Frankfort, Indiana.



# Iron Clad Dryer.....IN THE LEAD

**All Dry Houses** Built in 1898  
will be equipped with Import. new in-  
ventions for reducing cost of drying.

...

**Steam  
Heat,  
Natural  
Draft.**



**Guaranteed** To dry soft mud, stiff mud, dry  
pressed brick and tile, free  
from white-wash, disintegration or other  
injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

## WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,  
Harrison 296.

CHICAGO, ILL.



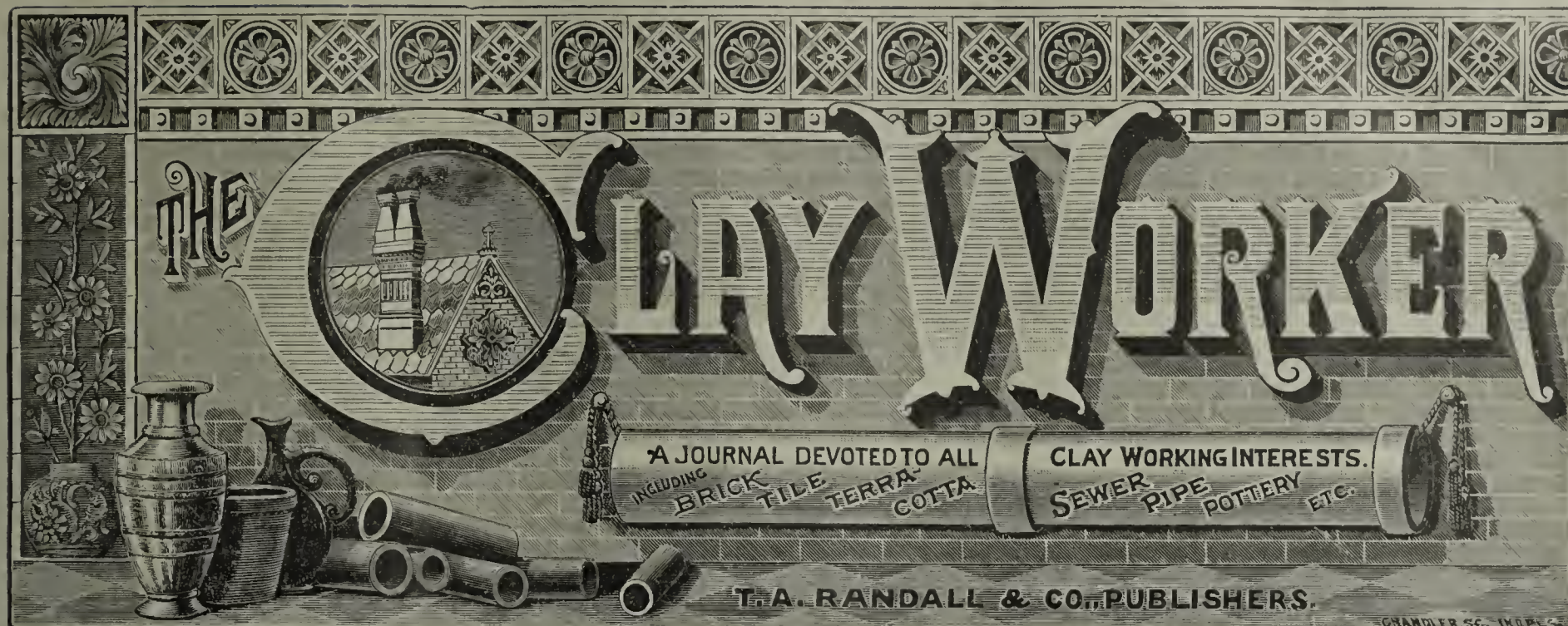
## DETROIT, MICH.

**The  
Best Brick  
Dryer  
On Earth**

NOTE -

- WE DRY ENOUGH BRICKS ANNUALLY -  
- TO BUILD A WALL TEN COURSES -  
- HIGH FROM SAN FRANCISCO TO -  
- NEW YORK -





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX, No. 2.

INDIANAPOLIS, IND., AUGUST, 1898.

\$2.00 a Year in Advance.

**JAMES FLOREY,**

MANUFACTURER OF

**Repressed, Front and Common Building Brick.**

DOWNINGTOWN, PA., July 15th, 1898.

MESSRS. CHAMBERS BROS. CO., Philadelphia, Pa.

Gentlemen:—Having just purchased my third Chambers Brick Machine for my yards at East Downingtown, where I first put in your machine four (4) years ago, I wish to say that I can see it pays a brickmaker to use your machines. If I had ignored the difference in first cost and purchased your machine instead of the others I tried when I first commenced to make machine bricks in my Rosemont yard I would have saved several thousand dollars. I can not speak too highly of your machine and its capacity for making bricks.

Yours very truly,

Signed, JAMES FLOREY.

**Chambers Brothers Company,**

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,  
171 South Canal Street.

PHILADELPHIA, PA.

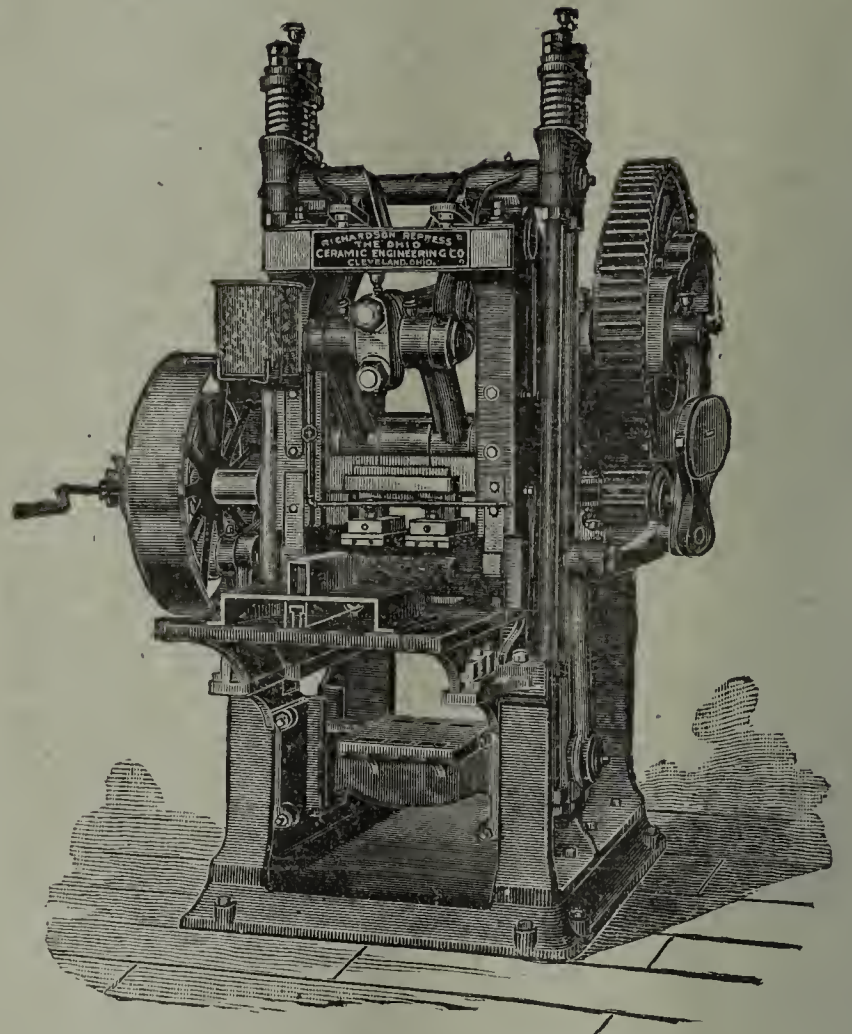


# A Small Mistake

makes great trouble.

You can't go wrong in buying  
a "Richardson Repress."  
Send for Catalogue.

**The Ohio Ceramic Engineering Co.**  
CLEVELAND, OHIO.



The RICHARDSON REPRESS.

## INDEX TO ADVERTISERS.

### Brick Machinery—Dry Press Process.

| Name.                                       | Page. | Name.                                    | Page. |
|---------------------------------------------|-------|------------------------------------------|-------|
| American Clay-Working Machine Co., The..... | 161   | Progress Press Brick and Machine Co..... | 141   |
| Chisholm, Boyd & White Co., The.....        | 88    | Ross-Keller Brick Machine Co.....        | 91    |
| Fernholtz Brick Press Co., The.....         | 90    | Simpson Brick Press Co.....              | 89    |

### Brick and Tile Machinery.

|                                              |          |                                        |          |
|----------------------------------------------|----------|----------------------------------------|----------|
| American Clay-Working Machine Co., The.....  | 161      | Horton Mfg Co., The.....               | 158      |
| Anderson Foundry and Machine Works.....      | 160      | Huetteman & Cramer Co., The.....       | 157      |
| Baird and Son, H. C.....                     | 156      | Kells & Sons.....                      | 156      |
| Brewer, H. & Co.....                         | 165      | Leader Mfg. Co., The.....              | 159      |
| Central Machine Works.....                   | 145      | Madden & Co.....                       | 151      |
| Chambers Brothers Co.....                    | 85, 159  | Ohio Ceramic Engineering Co., The..... | 86       |
| Chicago Brick Machinery Co.....              | 141      | Potts & Co., C. & A.....               | 162      |
| Eastern Machinery Co., The.....              | 166      | Raymond & Co., C. W.....               | 133      |
| Fate & Co., The J. D.....                    | ..       | Steele, J. C., & Son.....              | 153      |
| Freese, E. M. & Co.....                      | 164      | Taplin, Rice & Co.....                 | 143      |
| Henry Martin Brick Machine Mfg Co., The..... | 146, 157 | Wallace Mfg. Co., The.....             | 139, 167 |
| Hensley, J. W.....                           | 87       | Wellington Machine Co., The.....       | 135      |
|                                              |          | Wiles Co., A. M. & W. H.....           | 153      |
|                                              |          | Woolley Foundry and Machine Works..... | 163      |

### Brick Kilns and Dryers.

|                                     |     |                                 |     |
|-------------------------------------|-----|---------------------------------|-----|
| Alsip, S. H.....                    | 152 | Morrison & Co., R. B.....       | 155 |
| American Blower Co., The.....       | 168 | Phillips, S. G.....             | 144 |
| Carson, J. W.....                   | 147 | Pike, E. M.....                 | 147 |
| Eudaly, W. A.....                   | 155 | Reppell, L. H.....              | 152 |
| Fernholtz Brick Press Co., The..... | 90  | Standard Dry Kiln Co., The..... | 92  |
| Haigh, H.....                       | 154 | Swift, F. E.....                | 148 |
| Kaul, C. F.....                     | 147 | Wolff Dryer Co.....             | 168 |
| Lehmann & Co, F.....                | 154 | Yates, Alfred.....              | 148 |

### Brick Yard Supplies.

|                                               |          |                                                |     |
|-----------------------------------------------|----------|------------------------------------------------|-----|
| Arnold, D. J. C.....                          | 156      | Horton Mfg. Co., The.....                      | 158 |
| Atlas Bolt & Screw Co., The.....              | 146      | Jeffrey Manufacturing Co., The.....            | 151 |
| Carlin's Sons, Thomas.....                    | 146      | Marion Steam Shovel Co.....                    | 158 |
| Caldwell & Son Co., H. W.....                 | 149      | Mershon & Co., W. B.....                       | 145 |
| Carmichael, T. W.....                         | 144      | Mey, F. H. C.....                              | 146 |
| Carnell, Geo.....                             | 152      | Newton, A. H.....                              | 151 |
| Coldewe & Co., G.....                         | 145      | Phillips & McLaren.....                        | 150 |
| Elder & Dunlap.....                           | 148      | Pittsburg Mineral Screen Company, The.....     | 148 |
| Frost Engine Co.....                          | 142      | Stedman's Machine Works.....                   | 153 |
| Harrington & King Perforating Co., The.....   | 87       | Williams Patent Crusher and Pulverizer Co..... | 144 |
| Henry Martin Brick Machine Mfg. Co., The..... | 146, 157 |                                                |     |

### Miscellaneous.

|                                                 |     |                                            |          |
|-------------------------------------------------|-----|--------------------------------------------|----------|
| Associated Trade & Industrial Press.....        | 149 | Indianapolis Engraving and Electro Co..... | 148, 151 |
| Bennett & Sayer.....                            | 146 | Indianapolis School of Medicine.....       | 150      |
| Big Four R. R.....                              | 149 | Indiana, Decatur & Western... ..           | 150      |
| Cincinnati, Hamilton & Dayton R. R.....         | 150 | Illinois Central R. R.....                 | 156      |
| Chesapeake & Ohio R. R.....                     | 151 | Kendall & Flick.....                       | 147      |
| Clinton Paving and Building Brick Co., The..... | 136 | Lake Erie & Western.....                   | 151      |
| Coaldale Brick and Tile Co., The.....           | 136 | Many, F. B.....                            | 143      |
| Cotton Belt Route.....                          | 151 | Main Belting Co.....                       | 149      |
| Des Moines Brick Manufacturing Co., The.....    | 136 | McAvoy Vitrified Brick Co.....             | 137      |
| Dean Bros. Steam Pump Works.....                | 150 | Monon Route.....                           | 150      |
| Dover Fire Brick Co.....                        | 149 | Osborne, W. R.....                         | 148      |
| Evans & Howard.....                             | 145 | Purinton Paving Brick Co., The.....        | 137      |
| Gabriel & Schall.....                           | 147 | Rockwood Mfg. Co., The.....                | 150      |
| Geysbeck, S.....                                | 150 | Rochester Optical Co.....                  | 147      |
| Hay & Willits Mfg. Co.....                      | 160 | St. Louis Terra Cotta Co.....              | 144      |
| Indiana Bernudez Asphalt Co.....                | 136 | Tennille, A. F.....                        | 146      |
| Indianapolis College of Law... ..               | 147 | True, Arthur.....                          | 143      |
|                                                 |     | Vandalia Line.....                         | 149      |
|                                                 |     | VanDuzen Co., The E. W.....                | 146      |
|                                                 |     | Wabash Railroad.....                       | 149      |
|                                                 |     | Small Ads., Wanted, For Sale, etc.         |          |

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker



**THE HARRINGTON & KING PERFORATING CO.**  
CHICAGO, ILL.

**THE H. & K. P. CO.**  
PERFORATED SHEET STEEL  
FOR  
**CLAY SCREENS**

SEWER PIPE  
BRICK  
FOR CHUTE  
SCREENS.  
TERRA-COTTA  
FOR REVOLVING  
SCREENS.  
DRY PAN  
SCREENS.

Eastern Office: No. 284 Pearl Street,  
NEW YORK.

General Office and Works: No. 231 North Union St.  
CHICAGO, ILL., U. S. A.

# The MONARCH

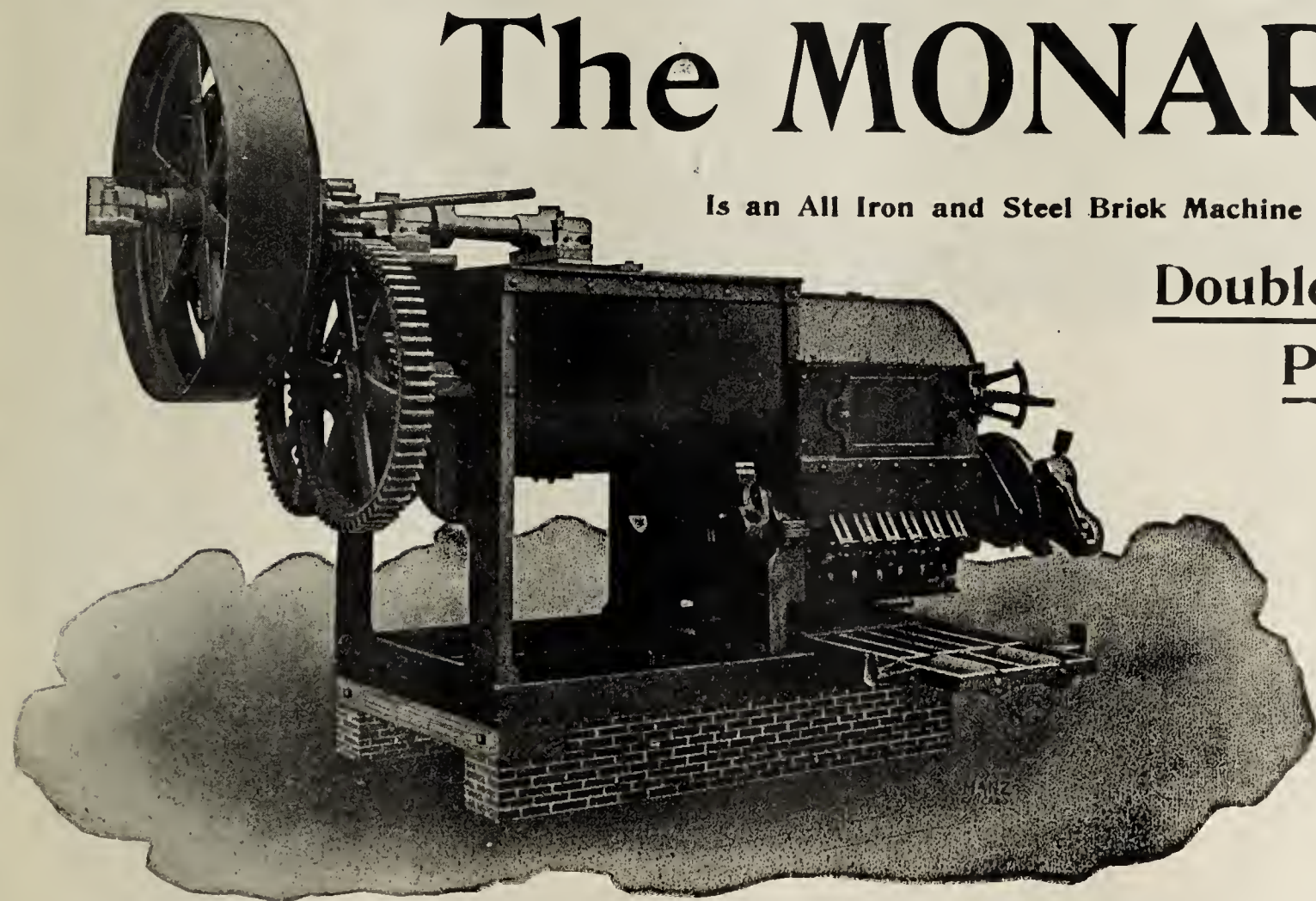
Is an All Iron and Steel Brick Machine with

Double  
Pug Mill.

...

SIMPLE  
IN CON-  
STRUCTION,  
DURABLE  
AND . . .  
POWERFUL.

...



Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new IRON QUAKER. Engines and boilers. Send for 1898 Catalogue.

**JAMES W. HENSLEY,** Successor to S. K. FLETCHER, Indianapolis, Ind.

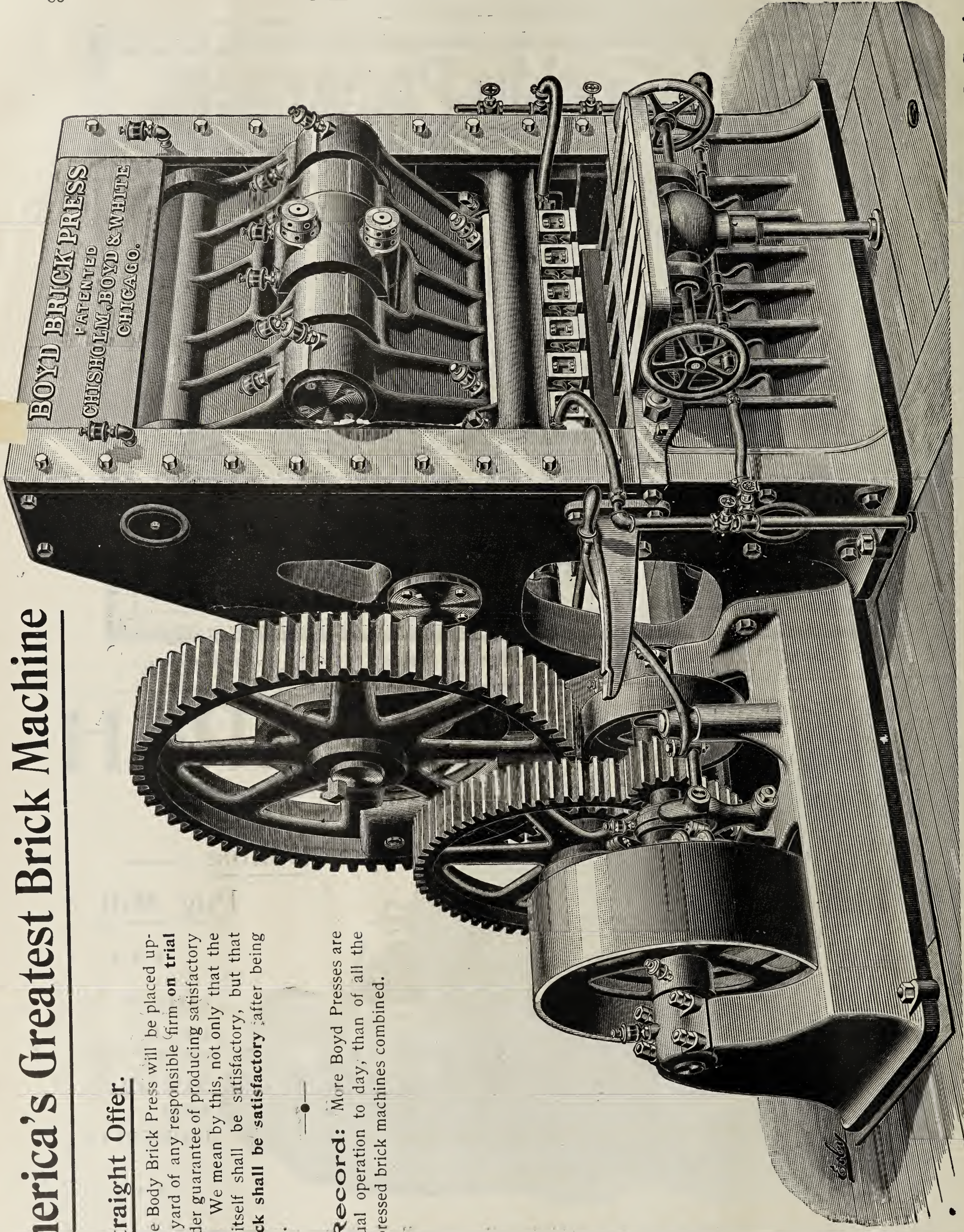


# America's Greatest Brick Machine

## A Straight Offer.

The Body Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

**Its Record:** More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,  
57th and Wallace Streets.

CABLE ADDRESS:  
"CHISHOLM, CHICAGO"  
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.



# The Survival of the Fittest.

THE inexorable law of the "Survival of the Fittest" is well illustrated in the continued success of the **SIMPSON BRICK PRESS**. It was one of the first successful dry presses manufactured in America and from its introduction has held a leading place. The improved **SIMPSON PRESS** is a thoroughly up-to-date machine and embodies many excellent features, that make it invaluable to the brickmaker who wishes to make the best quality of Press Brick—at moderate cost.

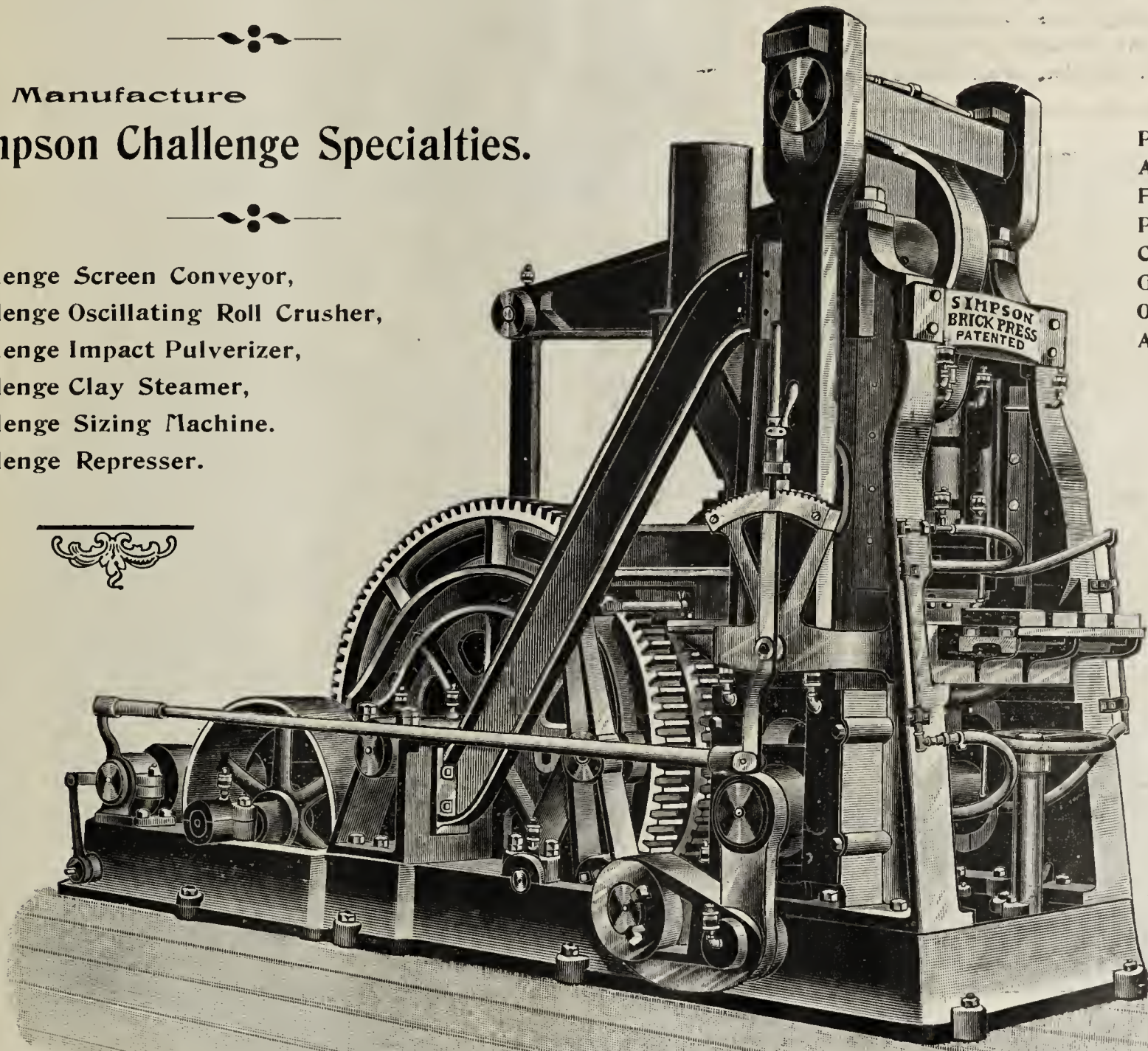
We make a specialty of complete equipments including every device required on a modern press brick plant. Don't fail to get a list of our new improved Challenge Clay Preparing Machinery.

We Manufacture

**Simpson Challenge Specialties.**

Challenge Screen Conveyor,  
Challenge Oscillating Roll Crusher,  
Challenge Impact Pulverizer,  
Challenge Clay Steamer,  
Challenge Sizing Machine.  
Challenge Represser.

PRICES  
AND  
FULL  
PARTICULARS  
CHEERFULLY  
GIVEN  
ON  
APPLICATION.



Simpson's 4-Mold Brick Press, Model AA, New Style. BUILT IN 4 SIZES.

**SIMPSON MACHINERY CO.,**

OFFICE AND WORKS: 77th and Jackson Ave. (FORMERLY STORMS AVE.)  
Grand Crossing, Ill.

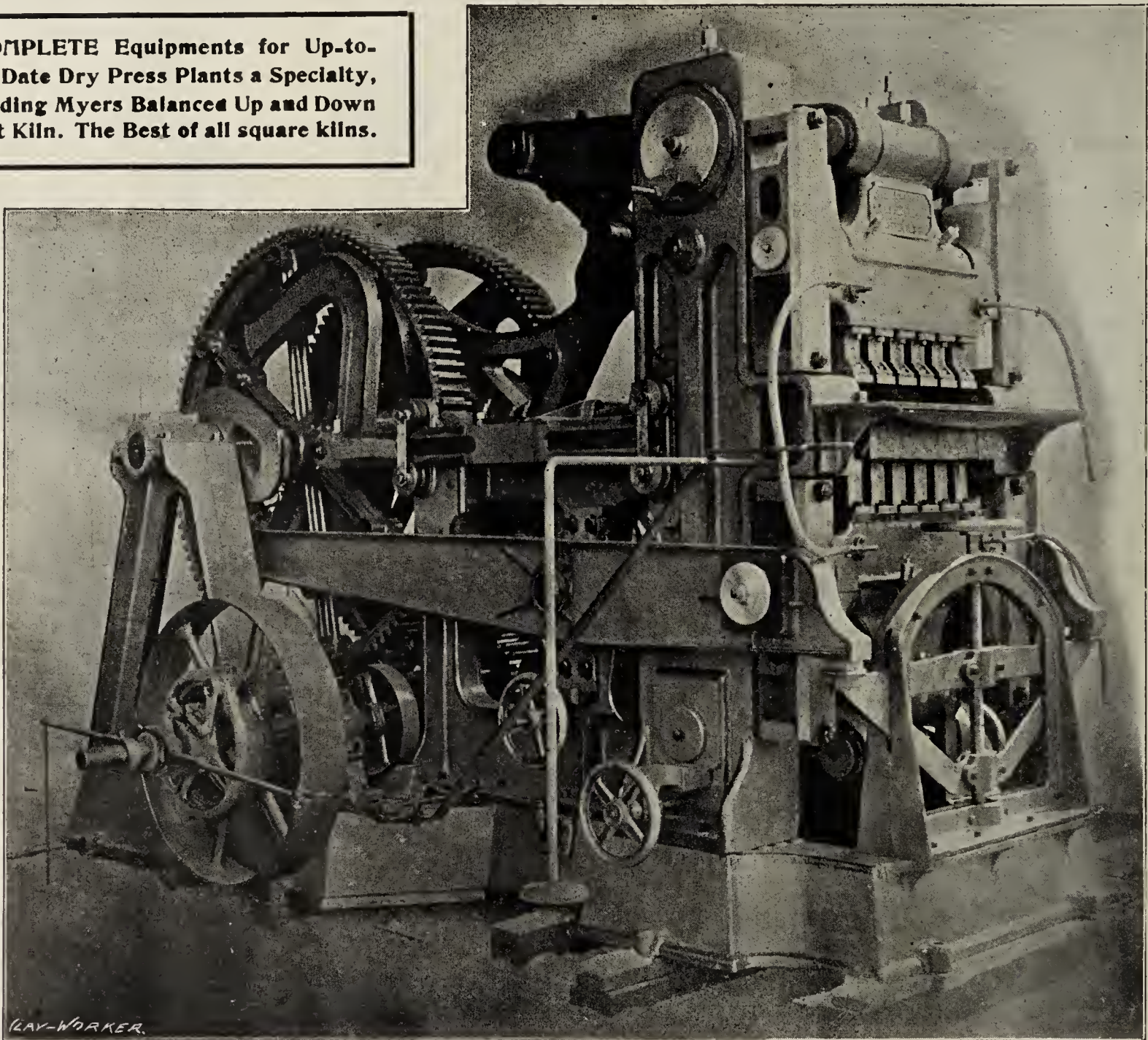
CHICAGO.



# The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

**C**OMPLETE Equipments for Up-to-Date Dry Press Plants a Specialty, including Myers Balanced Up and Down Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

## The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

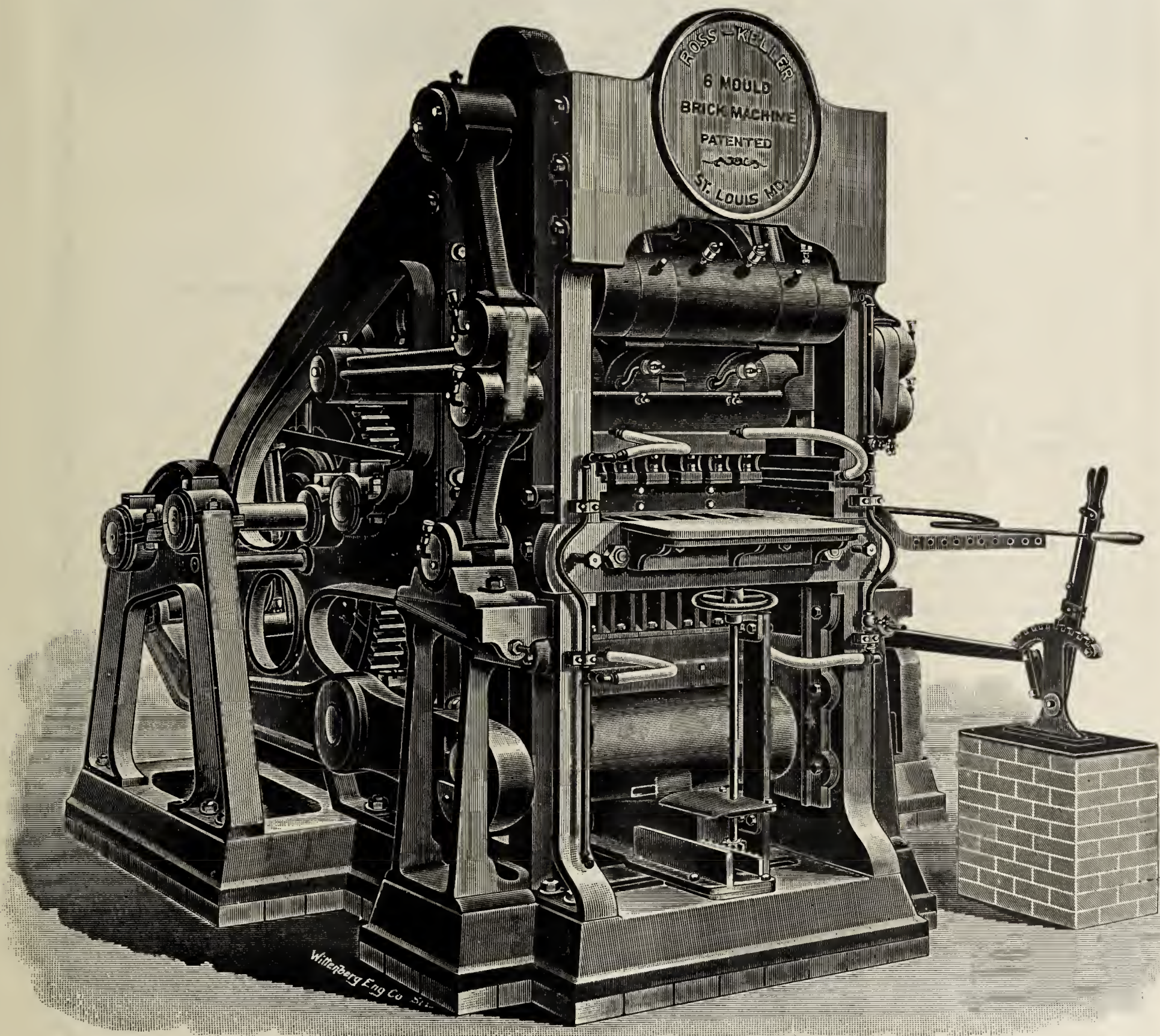
ST. LOUIS, MO.



# The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—————BRICK SET IN KILN DIRECT FROM MACHINE.—————



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

**Ross-Keller Brick Machine Company,**

**820 Commercial Building,**

**ST. LOUIS, MO., U. S. A.**



## The Turning Point....

Between success and failure in the brick-making business is many times in the Drier. No matter how good your clay may be, no matter how thorough your equipment may be, no matter how efficient your force may be, if your Drier isn't right, failure, in a greater or less degree will attend your efforts.

This is a logical conclusion, based on the following facts: If your Drier doesn't do its work quickly; dry your brick uniformly in a given time; prevent checking and cracking, and do it all with an economical use of steam, it will lose you money every day you operate it, and **that** means failure.

This much agreed to, the question arises, "which is the best Drier to buy," and "why?" We unhesitatingly say that



## The STANDARD IMPROVED BRICK AND TILE DRIER

Comes nearer being a **perfect** Drier than any other in the World. Of course we would naturally be expected to say that, because we are "interested," but why shouldn't we say it--when we have many letters from brick and tile makers in all sections of the country, which prove it?

See this is what one company thinks of **The Standard**:

THE STANDARD DRY KILN Co., Indianapolis, Ind.

In answer to your favor regarding the "Standard Drier" erected at my brick works at Maple Shade, N. J., would say;

Before putting in your Drier I was much troubled with whitewash in my brick, but this has all disappeared. I have burnt over two million brick since you put in the Drier, and have no whitewash whatever. We dry our brick very dry (25,000 every day) and presume it is carried off in the watersmoke from the Drier, as there is a vast decrease of gas from the kiln now when burning.

Your method of returning the condensed steam from the Drier back to the boiler with your Trap is perfect, working automatically, and raising the water about fifteen feet to throw it into the boiler. It requires no attention whatever.

I am glad I followed your advice and took the double deck cars, as the brick dry better, and there being less weight on each one the shrinkage can take place more naturally. The cars are entirely satisfactory, and move easy.

The Drier simplifies our business very much. I would not be without it, and consider it the **best Drier I have seen during an experience of thirty years.**

Yours respectfully,

AUGUSTUS REEVE.

Camden, N. J., Sept. 25, 1897.

Now, as this letter is but a single expression, taken from hundreds of a similar nature, does it not convince you that if you **want a Drier**, you should investigate this one?

We don't care what kind of clay you have, we will guarantee to Dry your product economically and satisfactorily.

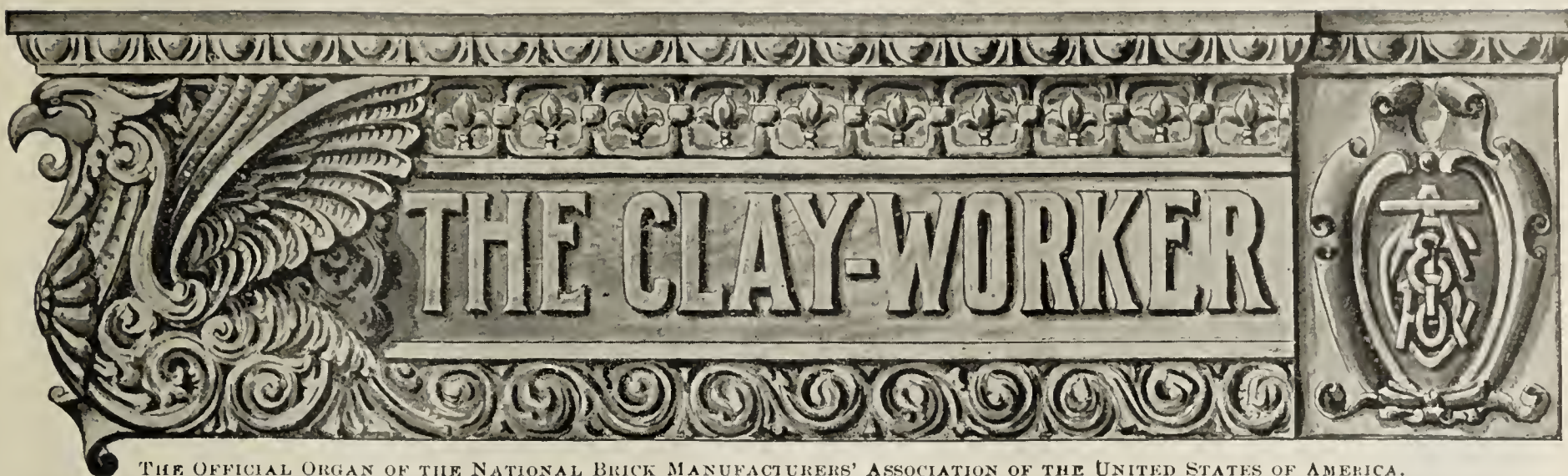
Write for catalogue, testimonials and full particulars.

# The Standard Dry Kiln Co.,

186 South Meridian Street.

INDIANAPOLIS, IND.





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX.

INDIANAPOLIS, IND., AUGUST, 1898.

No. 2.

Written for the CLAY-WORKER.

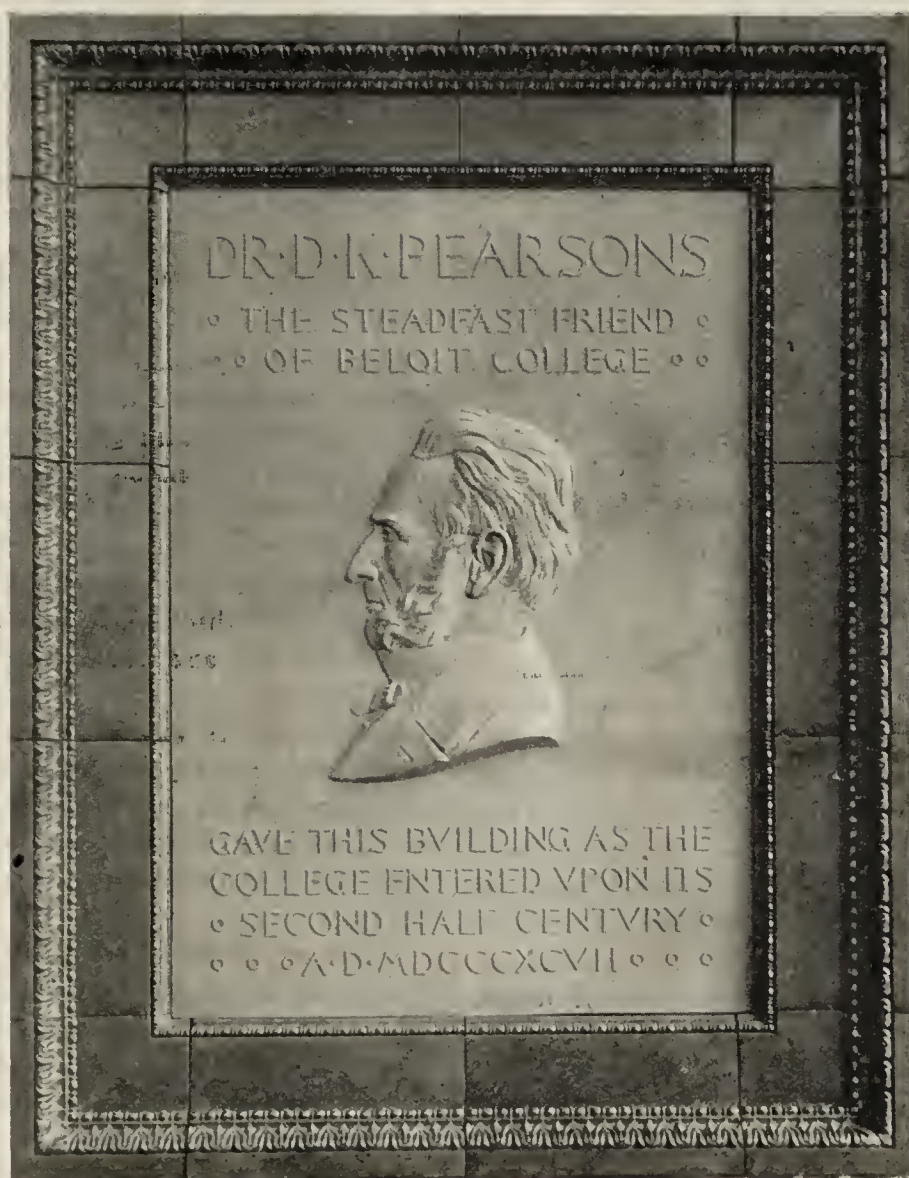
### A FITTING USE FOR TERRA COTTA.

HERETOFORE COMMEMORATIVE panels have been, as a rule, made in bronze and after the building was erected, they were nailed to the building to bear witness to the facts impressed upon them until such time as the nails should loosen, either by the natural erosion of time or by some wanton or careless act, after which the metal would lose its connection with the building and most likely find its way to the junk dealer.

The idea that a building is a monument is broadening and growing. It is extending everywhere and being much more generally accepted. People want to look back of the walls of the building and know its history, who built it? Who was the architect? Who the contractor and builder? Whose material was used? All these questions are asked not alone by prospective tenants, but by passers by. Every building has its own individuality and character. The inception of this comes from the donor or owner looking into the needs and uses for the structure, but more largely from the architect who brings his individual skill and research to bear on it and impresses them forcibly and indelibly. Nor does this individuality end here, but extends to every individual worker who honestly labors for the betterment of the structure. All are blended, however by the architect into the harmonious and perfect building and we see it is beautiful and we say it is secure and safe because the builders are of known integrity and skill.

In buildings which are given by individuals to the public or to educational institutions this is particularly true. They are

particularly strong in individuality and should surely stand as monuments to their donors and should so stand for ages, if properly built, as lasting monuments, having built into them their history, plainly written for future generations to study. It naturally follows that the commemorative panel inscribed with this history should be built firmly into the wall as a fixed and firm part of the building. This idea was carried out in the case of the panel, an illustration of which accompanies this and the outcome has been very pleasant.



MEMORIAL TABLET. Executed in Terra Cotta by the American Terra Cotta and Ceramic Co., Chicago.

The panel was used in the Emerson Hall, recently erected, at Beloit, Wis., which is a building full of individuality. Every line, every brick, every tile, everything in fact in its composition speaks of careful thought and caretaking selection. The foundations are laid in Purington Paving Brick Co's, Galesburg pavers and the superstructure in the same Company's "Puritan" brick. The trim, water table, sills, transoms, lintels, copings, etc., are in terra cotta to match. Purington and I have always lived in harmony and I need not state that his brick and my terra cotta harmonize, as in fact do both brick and terra cotta with Harris' tile on the roof. The building is hard burned clay from foundation to ridge.

I doubt if the donor of this building, who happens to be a near neighbor of mine, whose portrait wrought in low relief appears in the panel, has a more characteristic monument among all the many buildings he has given, than this building of which this panel forms a part. By means of this panel, those who will enjoy the fruits of his generosity long years hence, will, as they pass in and out, read this record of his generosity and look upon the face of the man who wrought and planned for the future. Dr. Eaton, the President of the College, and my old



school mate, contributed largely of his individuality to this structure as also did the architects Patton & Fisher and the sculptor, Richard Smith, who fairly wrought life into the clay in low relief. This work then stands as a part and parcel of the structure. Not dependent on nails nor trusting to glue, but standing firm and fast generation after generation, a fitting and lasting monument.

W. D. GATES.

Written for the CLAY-WORKER.

### HINTS ON BRICKMAKING.

BY R. B. MORRISON.

#### —Semi-Dry Clay Process.—

**THE** TERM "DRY CLAY PROCESS" is obsolete and it is well it is. Making brick from dry clay, that is, clay without water in it, is and always has been a failure. I have always claimed in my writings that a machine that will take clay from the mine and make it into brick, without putting water into it was the ideal machine. The great difficulty to overcome was the preparing of the clay in its semi-dry state. In the beginning of these articles, thirteen years ago, I did not consider the dry clay process a success, and in the discussion of this subject, I will not consider the hydraulic machines, as they are not accessible to the brickmaker, being under the control of a monopoly, as I understand it. Will therefore only discuss semi-dry press machine, with mechanical power. That I may not be misunderstood will say that in discussing semi-dry press machines I refer to machines now in use popularly known as "dry press machines."

I find that clay as used in modern semi-dry press machines contains ten per cent. of its weight in moisture, that is about the average, hence it is not dry. With modern pulverizers, screens and mixers clay can be properly prepared for the press and from which can be made a brick perfect in shape and finish, and when properly dried and burned produces a brick that is strong and durable and pleasing to the eye. There is one point to consider at the beginning. To make a good, semi-dry press brick, you must have good strong plastic clay. Sandy or porous clay will not make a good brick by this process. If you try to make a semi-dry brick of any but a good quality of clay you are doomed to disappointment. Machine manufacturers would serve their own best interests by saying as much to their customers.

The first requisite is a good plastic quality of clay, preparing machinery that will reduce to proper fineness. Then a first-class semi-dry press machine. It would not be proper for the writer to mention any particular make of machine. There are good, better and best. That some of them are a practical success and have reached a wonderful degree of perfection, the writer can testify, and in making this statement I have no apology to offer for what I may have written ten years ago, as the semi-dry manufacturers have met me more than half way by using clay semi-dry instead of dry, and securing machinery that properly prepares clay for this process, and by strengthening and perfecting their own machines, semi-dry press machines have passed the experimental stage, and are to-day a practical success.

In reference to handling and storing clays for semi-dry press brick, one gentleman of long experience and in whose judgment I have the utmost confidence, says that after clay has been properly harvested and stored in sheds, it should remain there at least six months before using, and twelve months would be better. I believe this is of great benefit to the clay. But in many cases this is really impracticable, as it requires so much room for storage. Since my friend made the statement referred to, there has been a vast improvement made in pulverizers. I find in my experience that where clay is harvested dry enough and stored that it can be used within a month and

produce excellent brick. In making brick containing water to the amount of ten per cent. of its weight, the question arises, can these brick be set in kiln direct from the machine, or must they be dried before they are set in kiln? I will say candidly, I think it is best and safest to dry them before kilning. At the same time, it is practicable to set such brick direct from machine, and if proper care is exercised and sufficient time allowed in watersmoking, they can be successfully burned. In water-smoking these brick, I leave the manhole uncovered for sixty hours (I refer to down-draft kilns). This does not prevent moisture from passing out freely through draft stacks, but allows moisture that may be in the crown and in the top courses of the kiln to pass out through the manhole. This reduces amount of moisture going downward through the brick. Then if a fireman carelessly makes too much heat in the furnaces, this acts as a safety valve, preventing too high a degree of heat being generated in the dome of the kiln. We have been burning semi-dry press brick direct from machine with satisfactory results. There is less risk, however, if they are dried before going into the kiln.

While I advocate the semi-dry process for making face brick, I do not think it is best for making common building brick. There are many reasons why the plastic or soft clay process is best for common brick. Clay can be used by these processes with success that could not be used by the semi-dry process. Again, it requires more costly machines for semi-dry brick. There is less waste in marketing plastic or soft clay brick, as the salmon brick can be utilized, while it is generally admitted that a salmon brick from a semi-dry press machine is of little value in the market. So it is plain that the brickmaker must determine what kind of brick he wishes to put on the market before he can tell what process he should adopt.

In another article we will discuss the evolution of the soft and plastic machines. Each of these, like the semi-dry, has passed through their experimental stages, and like the other, they are to-day well established as standard machines.

### NO CAUSE FOR ALARM.

Unless the present war is more protracted and assumes greater proportions than now seems likely, there is no good reason why it should greatly disturb the finances of this country or seriously defect any branch of trade, commerce or industry from its regular and accustomed channels.

The necessary funds for the war will be raised by rational methods, and the burden will fall upon the country very lightly. The chief harm will come from imaginary difficulties, baseless fears and exaggerated notions, bred by the fever of war.

If the cost of war amounts to \$500,000 a day, and the war should last for a year, what would it amount to for a country like ours? A war expenditure even of \$300,000,000 would make a tax of only one per cent. on the assessed valuation of the real and personal property in the United States according to the last census.

The farm products of the Middle States alone in a single year would pay it all. So would the wheat crop of the United States in a year at half the present rates; and if all our dairy cattle were sold it would settle the bill and leave a surplus of \$60,000,000. Or by adopting the expedient of trebling the present rates of revenue taxation on domestic liquor and beer, we could make these carry the whole burden.

The country will not suffer materially from the loss of capable men. The 200,000 volunteers already called out constitute less than one-fourth of one per cent. of our entire population. New York State alone could furnish the number called for easily. New York City alone was able to muster an army one-half as large for its McKinley parade in the last presidential campaign, and an equal number to do homage to



General Grant's memory when his remains were entombed at Riverside.

The injurious results of war may be greatly lessened or largely prevented if those who remain at home will not allow themselves to become unduly perturbed by passing events, but will go about their usual avocations with their accustomed energy, prudence and good sense. It is only to a few, at the most, that the high privilege will come of serving their country in the lines of battle: to the many the no less exalted privilege will remain of serving their country by doing their duty nobly and well as it presents itself in common walks of life. So let the wheels of industry continue to move while the wheels of war roll on.—Leslie's Weekly.

Written for the CLAY-WORKER.

#### THE SPANISH-AMERICAN WAR AND THE GERMAN CLAYWORKING INDUSTRIES.

UNDER THIS CAPTION the German Brick and Pottery Gazette of July 4th publishes an article by Mr. K. Duemmler, its able editor, in which the writer takes a very sensible view of the situation. In the introduction mention is made of the fact that in the convention of the united ceramic trades, held at Berlin on June 30th, it was unanimously resolved that the German clay-workers are opposed to the unfriendly position taken by a large part of the press against the United States, there being not the least reason for this attitude.

Mr. Duemmler proceeds to state that as far as the Gazette is concerned it is hardly necessary to say that it fully agrees with the action taken in the meeting. He who has acquainted himself with the United States through actual observation, and who has compared the histories of both Spain and the Republic will not take a doubtful position. The conquest, and especially the administration of Central America, South America and the Philippine islands, have always been equivalent to oppression. The high state of civilization found by the Spaniards in Mexico and Peru was destroyed by them with fire and sword. The system of oppression and the fostering of ignorance among the people was adopted, not only in the conquered countries, but also in the native land. The civilization existing in Spain under the Moorish rulers, the buildings at Sevilla, Toledo, Cordova, Granada, with their magnificent terra cotta, wall and floor tiles being witnesses of this, even to-day has never been regained by the Spanish, not even in the days of Ferdinand and Isabella. It must be remembered that most of the buildings erected during the reign of this royal pair were executed by Moorish artists and artisans, who, thanks to the inquisition, were gradually expelled from the country.

That a country whose history gives evidence of a government always hostile to civilization, and which puts upon the inhabitants of its colonies only duties and no privileges, is not entitled to the possession of colonies, must be considered as historical truth.

It was generally conceded that the Spanish naval power would have a hard position against the American navy, but nobody expected that the Spaniards would desist entirely from offensive warfare. Likewise the opinion was prevalent that the Spanish land forces were superior to the American, not only numerically, but also in regard to efficiency. But now the storming of the forts of Santiago by the American troops, of whom a large part consisted of volunteers, hardly through drill, and without a preceding regular siege, has again shown the superiority of a higher civilization which the Spanish soldiers are lacking. The excellent public education which is given to all Americans is an ample substitute for the long drill which the Spaniards, who for the most part cannot read or write, must undergo.

It is to be hoped that peace will soon be established again.

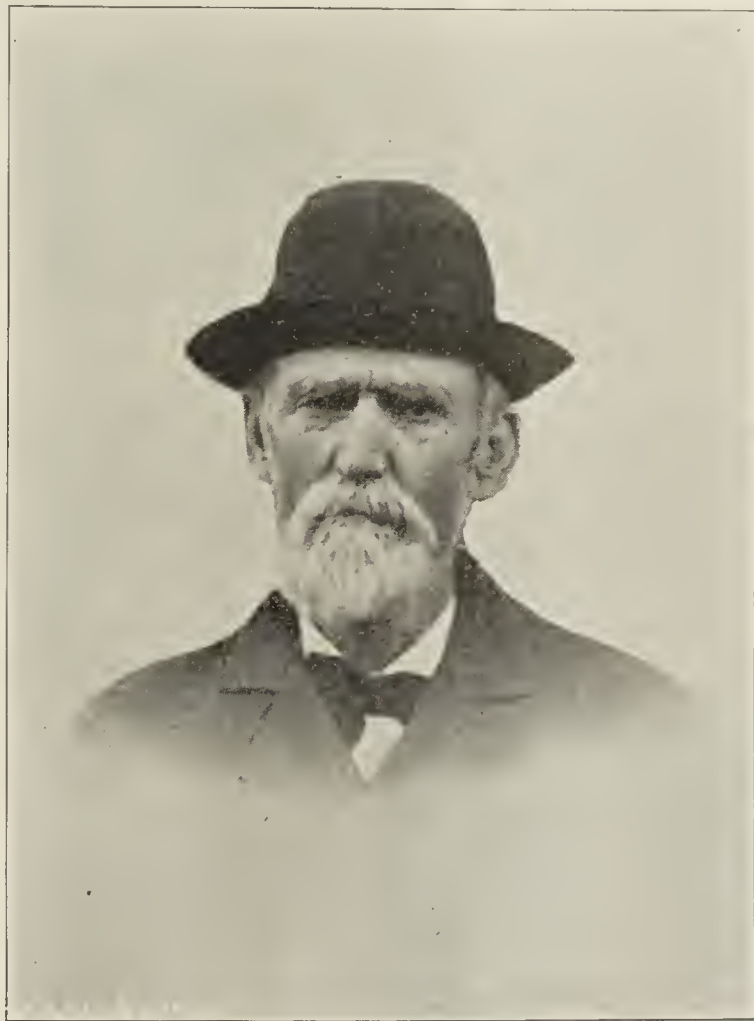
May the church bells and the liberty bell at the old State House at Philadelphia announce to the American citizens on Independence day, not only the great holiday, but also a great victory, and with it an early peace.

A. V. B.

#### OBITUARY.

##### Albert H. Winslow.

ANOTHER AGED and well-known brickmaker has left us and passed over to the silent majority. Albert H. Winslow, of the firm of French & Winslow, firebrick and stove lining manufacturers, of Taunton, Mass., was taken away suddenly by a gun shot wound through his heart. He was alone at the time he received the wound, and his death being instantaneous his friends could get no explanation as to the manner of the discharge of the gun. He was in good health and had risen early, as usual with him, and as was his custom he had gone out to the stable to attend to his horse. When his family called him to breakfast, getting no response they went to seek him, and found him dead with the discharged gun at



ALBERT H. WINSLOW, Deceased, Taunton, Mass.

his side. No reason can be assigned that should lead him to take his own life; his domestic and business relations were of the best, and void of any discord or disturbing elements, and he was a prosperous man in every relation of life.

Mr. Winslow has for many years been a member of the firm of French & Winslow, and was a charter member of the National Association of Firebrick and Stove Lining Makers. He took an active part in all that pertained to the welfare of the stove lining industry and his absence will be regretted by his fellow-craftsmen. His death removes another link from the chain of old brickmakers. He was sixty-nine years of age, but owing to the sturdy New England habits and manner of living he had the promise of many more years of healthy old age. Among his fellow-citizens and neighbors he was held in high esteem as a man of strict business integrity and sterling character, a good friend, a useful citizen and a desirable neighbor. He leaves a wife and two daughters.

Before Mr. Winslow joined the firm of French & Winslow



he had already won for himself a national reputation as a designer of fine and fast schooners. His life had been spent among seamen and shipping. He was a ship owner, and designed most all of the packet schooners of the Taunton and Somerset line. His last great work as a ship builder was making the model of the five masted schooner "Governor Ames." This ship was the largest schooner ever built and was a great success. Mr. Winslow was a part owner of this vessel.

Mr. Winslow was known to many members of the N. B. M. A., and the National Association of Stove Lining Manufacturers desire through the Clay-Worker to notify them of our friend's passing away.

JAMES TAYLOR.

Written for the CLAY-WORKER.

#### ENGLISH CHINA CLAYS.



EARLY IN THE seventeenth century the Cornwall district of the southwestern district was noted for its tin mines, to-day the tin mines are forgotten and the same area is the greatest kaolin producing region in the world. As far back as 1750 it was noticed that the granite

forming the wall rock of the veins was decomposed to a white clay-like substance, and Wm. Cookworthy, a potter, began experimenting with it, to see if it would not be possible to utilize it in the manufacture of china. So successful were his results that the mining of tin was abandoned, and that of kaolin begun.

The industry has expanded so that at the present day about 350,000 tons of kaolin are annually mined and shipped, not only to various points in England, but also in Germany, France, Italy, Denmark and the United States. Some of the kaolin pits in Cornwall are of gigantic dimensions, being as much as 200 feet deep and 600 to 1,000 feet long. The rock from which the kaolin has formed is a granite, containing the two materials, quartz and feldspar. The latter decomposes to the kaolin, the former does not, so that the loose granules of quartz are scattered all through the kaolin, and form about 50

per cent. of the mass. Through the kindness of Mr. James Lomer, of St. Anstell, I was permitted to visit the pits of Martin Bros., which are the largest workings in that region. Owing to the large amount of quartz the kaolin is easily loosened, with picks from the sides of the bank and washed down into the bottom of the pits by means of a stream of water. When it reaches the bottom it is conducted into large stone basins, where a rough sorting takes place, for the quartz, on account of its greater weight, settles quickly to the bottom, while the kaolin remains in suspension in the water, as it flows off at the other end of the basin. There are several of these basins, and the overflow from all runs into a dump at the deepest part of the pit. From here a large pipe extends up to the surface 200 feet above, and by means of a powerful pump the water and



Statuette of Thorwaldsens "Hebe" made of China Clay.

suspended clay are brought to the surface and discharged into the micas. These are a series of troughs, or rather one very broad trough divided into a number of parallel sections. Across the lower end is a hinged board over which the water

has to flow in order to reach the next second section of troughing. The raising or lowering this board acts as a dam and the velocity of the current of water can be regulated. In the first section of the troughing much fine sand and mica are dropped, and in the second section, which is like the first, but twice as wide, still more fine sand is eliminated. There is also a hinged board at the lower end of the second section. If it is found that not enough sand is being separated in the troughs, by raising the hinged boards the current is slackened and consequently more sand is dropped.

From the troughing the water and finely divided suspended



Kaolin Pit at St. Anstell, Cornwall.

kaolin flow into the settling tanks—big, round, deep tanks, built of such big blocks of stone that they remind one of bits of old Roman masonry. When the kaolin has settled the water is drawn off, and the fluid sediment shoveled through a door in the bottom of the vat into the drying tanks, which are long, shallow stone vats, heated by flues passing underneath it. This method of getting rid of the water is used instead of filter presses. The sand left in the catch basins down in the pit is shoveled into skiffs and hauled to the surface, where the accumulations of it have built up dump heaps which can be seen from a long distance, and rival our Pennsylvania culm banks in size. While the method of separation practiced in the pits is an excellent one, it will at once be seen that it is applicable only in the case of loose, sandy kaolins. The one step in the process though of interest to all miners and washers of kaolin, is the system of straight broad troughing or mica. It has been found by many producers to give a better and more uniform product than when the zig-zag narrow troughing is used.

To the northeast of St. Anstell in Devon, near the valley of Torrington, is found an extensive series of ball and stoneware clays, similar to those mined farther south near Poole, and known as Teignmouth clay.

The pits of Messrs Holwill, which are among the most important of that region, have been mined for over twenty years. They are eight miles from the railway, but there has been such a demand for the clay that the Holwills have constructed a narrow-gauge road of their own, which in one place crosses a trestle 100 feet high and 500 long. This clay differs from the St. Anstell kaolin in occurring in beds. It is far more plastic, has greater binding power, and is much tougher. Where the clay is in pockets, surrounded by sand and sandy clay, it has to be mined by shafts, but otherwise open workings, as shown in the illustrations here resorted to. Much of the Torrington clay is used at the Lambeth pottery of Doulton & Co. for the manufacture of stoneware, and large quantities also go to Staffordshire.



The St. Anstell kaolins are used for white earthenware and porcelain, but perhaps the simplest, and at the same time beautiful ware, made from them is the Copenhagen bisque ware. It shows off well the snowy whiteness of the burned kaolin, and examples well how much can be done with the clay alone, unaided by any superficial decoration.

HEINRICH.

Written for the CLAY-WORKER.

#### MODERN AMERICAN FRONT BRICK—Eleventh Paper.

##### —Faults of Glazed Brick.—

HAVING IN THE last paper given a brief outline of the manufacture of glazed brick, it will, perhaps, be found profitable to summarize their faults, and to show how the defects may be remedied. Glazed brick are certainly liable to mishaps and accidents, notwithstanding all the care which may be devoted to them. But the loss due to faulty goods may be reduced to a low per centage if certain precautions are observed. The greatest pains must be taken to keep the glaze composition the same all along; the ingredients must be ground together thoroughly; no imperfect brick must be allowed to go into the kiln; the firing must be continued a certain length of time in every burn, and the required heat must be attained, but not exceeded. Much of the loss known to glazed brick manufacturers is due to downright violation of important principles, and sometimes, also, gross carelessness. It must be our task to examine some of the more common faults, endeavoring to trace them to their origin.

##### —Crazing.—

This is one of the most common ills with which glazes are afflicted. As we have seen in a preceding paper, it is due to the fact that the glaze expands more than the body. The glaze is thus tightly stretched over the brick, and, according to the degree of tension, it is cracked or crazed, the mesh of cracks being the closer the greater the tension, and the wider the less it is. The degree of crazing is a good index of the tension existing between body and glaze, and the means of prevention



Kaolin Pit, St. Anstell, Cornwall; showing Catch Basin in Bottom for Collecting the Clay and Tracks for Hoisting up the Sand.

may be gauged accordingly. It is obvious that if the expansion is equalized there will be no crazing, and it does not matter whether we adjust the body to the glaze or vice versa, as long as the tension is removed. Where it is so desired the body may be made to fit the glaze, but the usual way is to adjust the glaze to the body. In the case of glazed tiles whose body is under control, it is practically feasible to make the adjustment in the body composition. It has been proven by practical tests that the addition of silica (quartz or flint) to the body increases the expansion of the latter. When we

speak of expansion we must realize that it is equal to the contraction in magnitude. Properly speaking we should say co-efficient of expansion and contraction, but to be brief we use the term co-efficient of expansion, or simply co-efficient. Suppose we have a glaze that crazes, that is, which has a greater co-efficient of expansion than the body. The addition of silica to the clay will tend to increase the expansion of the body, and thus make it equal to that of the glaze. When enough quartz sand has been added a perfect balance will be attained, and no crazing will take place. Likewise, if we take away some of the clay



View near Kaolin Pits at St. Anstell, Cornwall; showing waste Heaps of Sand.

substance from the body, leaving behind a greater per centage of silica, the same result will be obtained.

It is a well-known fact that a dense body expands and contracts more than a more porous one. This gives us another means of increasing the co-efficient of the body. If we have a clay ground medium fine, by grinding it finer the body will be made denser, and the expansion is increased. In this manner crazing may sometimes be done away with.

We all know that harder burning makes a brick denser, and hence increases its co-efficient of expansion. We thus have still another means of equalizing the difficulty between body and glaze.

From what we have seen we now have three means of increasing the expansion of the body equal to that of the glaze, and they are: Addition of silica in the shape of sand or flint, finer grinding and harder burning. These alterations are accomplished without any great practical difficulties, but usually the manufacturers prefer to neglect the body composition and to equalize the difference by adjusting the glaze.

Now we must proceed to change the glaze so that its co-efficient is decreased and lowered to that of the body. In this case we have to deal with a glass and not a stone-like mass. It has been found that silica added to a glaze acts quite differently than when added to the body. In the first case it decreases expansion. In the second, as we have seen, it increases the co-efficient. This difference in behavior may be explained by the fact that in the body, silica remains comparatively unchanged, especially if the quartz grains are quite coarse, while in the glaze it is dissolved, and either combines with the bases, forming silicates, or is kept in solution as uncombined silica, like sugar in water. It has been proven beyond doubt that the addition of silica to the glaze decreases the co-efficient of the latter. Therefore, if the expansion is lowered to that of the body, harmony will be established and crazing done away with.

From what has been said in a previous paper, we know that boracic acid is able to take the place of silica in lower melting glazes, in such fusing below cone No. 2. Boracic acid, like silica, tends to reduce the expansion of the glaze, and it may be used to remedy crazing as well as silica. This is a great help



for those who are tied down to a narrow limit of temperature. As the melting point of a glaze rises with an increase in silica, a glaze corrected by an addition of flint would require a higher heat, which often would be very inconvenient to the manufacturer. But as boracic acid lowers the melting point, we are thus enabled to replace part of the silica by boracic acid, do away with crazing and still maintain the same melting point.

There is yet another way to accomplish the same result, the correction of crazing. We might take away from the glaze some of the heavier fluxes and replace them by lighter ones.



Ball Clay Pit of Hollwill Bros., near Torrington, Eng.

This is virtually equivalent to an increase in silica. For instance, if there is lead in the glaze which crazes, and we replace part of the lead by lime, which is about one-third as heavy, the proportion of silica to the total weight of the bases is now much greater. Or, in other words, in a pound of the glaze, after the change, there is more silica and less of the bases than before.

We see that practically there is only one way of curing crazing by changing the glaze, and that is through an increase in silica direct or by replacing heavier bases by lighter ones. This change in either form is very easily accomplished, and the result is certain. The melting point disturbed by the increase in silica may be kept the same in lower melting glazes by the use of boracic acid. Owing to its solubility in water, boracic acid requires fritting, in order to make it insoluble and fit to be used in the glaze.

#### —Shivering.—

By this term is meant the cracking and breaking of the body, due to a phenomenon which is the reverse of crazing. It may show itself only by the breaking off of small particles of the body along the edges of the brick, or it may result in the complete destruction of the ware in the case of tiles. As in crazing, we have to deal here with a difference in expansion, and it is the body which expands more than the glaze. Hence the conditions are exactly reversed, and practice has shown that shivering may be remedied by applying the reverse of the directions given under crazing. We might thus do away with the defect by changing either the body or the glaze. In the body we would have to take away some of the silica, grind coarser and burn softer. In the glaze the silica must be reduced, either by taking away some of the flint or quartz, or by substituting heavier fluxes in place of lighter ones. Boracic acid must be treated like silica in glazes melting below cone No. 2.

In connection with crazing and shivering, the time of firing is a very important factor. Particles of the body being constantly dissolved by the melted glaze, it is obvious that the longer we fire the greater will be the change in the composi-

tion of the glaze. Let us take a practical example. Suppose a glaze crazes if the firing is being continued for four hours after the glaze has fused and now we let firing go on for six hours. It is obvious that now more silica and silicates are dissolved from the body than in the first case, and as a result we find that crazing has disappeared. On the other hand, if the glaze is naturally inclined to shiver, owing to its chemical composition, longer firing will certainly aggravate the defect.

#### —Devitrification.—

By this term is understood the stony appearance of the glaze. If a glaze which is intended to be transparent becomes opaque and stone-like, without the addition of pacifying agents like tin oxide, phosphate of lime, arsenic, etc., we say that it is devitrified. It has lost its glass-like appearance. This defect occasionally puzzles the manufacturer, for at times it might make itself quite evident, while again it can hardly be noticed. This may be due to slow or rapid cooling. The slower the cooling the greater is the tendency of the dissolved particles to crystallize out and to make the glaze opaque, while rapid cooling does not give them time to segregate, and the result is a more or less transparent glaze. In the formation of all silicates, the rate of cooling is of vital importance. Slow cooling produces crystallized and hence opaque bodies, while comparatively rapid cooling is essential to the production of amorphous, glass-like substances. In glazes, devitrification is due to an excess of some ingredient, which may be lime, magnesia, zinc oxide, alumina or silica, usually the last one. If the bases are in excess they must be reduced, or the silica increased; while in the case of devitrification caused by excess of silica, which happens most frequently, it must be reduced or alumina added. Alumina, if not in excess, is of the greatest importance in preventing devitrification. For instance, a glaze consisting of one equivalent of bases and three of silica will invariably become opaque, while if, say, three-tenths of an equivalent of alumina are added, the result will be a clear glaze. Tin oxide, phosphate of lime, etc., cannot be said to produce devitrification, since they do not enter the glass-forming process at all,



Clay Heaps around mouth of Shaft, Hollwill Bros., Stoneware Clay Mines near Torrington, Eng.

and are certain to cause opacity, being only suspended or temporarily dissolved in the glaze.

#### —Running.—

This means excessive flowing of the glaze while it is in the liquid state. In very low-fusing lead glazes it cannot be avoided. Running may be remedied or modified by raising the contents of alumina or silica as much as the scope of the melting point will allow.

#### —Imperfect Fusion.—

Evidently this defect is due either to a chemical composition



requiring a higher heat than that for which it is intended or to insufficient burning. In the first case the fault is remedied by reducing the silica or by replacing less active fluxes, like lime and magnesia, by more active ones, as barium and lead oxide. The remedy in the second case is self-evident.

#### —Blistered Glazes.—

Blisters and bubbles in glazes are always produced by gases escaping during the viscous or semi-fluid condition. If the burning is stopped during the evolution of the gas, the surface will be found to be disfigured by cavities covered with a thin coating of glass. The gas causing the trouble is sulphuric acid. It may enter the glaze either with the glaze ingredients and water used in glazing, or it may be introduced by the gases from sulphurous coal. The remedy lies in three directions: Care in excluding ingredients containing sulphuric acid and sulphurous water, raising the melting point of the glaze, and lengthening the firing period, so that all the gas may be evolved and the glaze be given time to smoothen. Use of reducing fire conditions during the burn. Reducing fire may be maintained for three or four periods of one hour each, followed by at least three hours of clear, oxidizing firing.

#### —Dead Surface.—

Dead surface of a glaze, caused by an iridescent film, which, though removed by cleaning, will still appear again, is due to sulphuric acid in the glaze, and the remedies are the same as given under blistered glazes.

#### —Dry Spots.—

Sometimes we see a glaze full of spots not covered by the glaze. On careful examination these dry spots will be found to have originated from cracks formed during the drying and water-smoking periods. In fact, the defect is usually due to lack of cohesion of the glaze particles. During the first stages of the burning cracking occurs, and the places thus left open are not covered afterwards. Hence in remedying this fault we must increase cohesion, and we do this by adding clay substance, either in the shape of kaolin, ball clay or any other suitable plastic clay, as much as the scope of the melting point will permit. In the case of glazes where clay could not be added without raising the melting temperature too high, one will have to resort to the use of glue-like substances, like flour paste or dextrin. Being organic, these burn out readily during the firing. Excess of zinc oxide invariably gives rise to dry spots, and in this case the only course open is to reduce its contents.

#### —Blackened Surface.—

In using glazes containing lead, one occasionally has to deal with blackened glazes. The cause of the discoloration is metallic lead reduced from the oxide. The trouble is evidently caused by too strong or too long continued reducing fire condition while the glaze was approaching fusion. The metallic lead reduced from the oxide was rapidly coated with a layer of fused glass, which made reoxidation impossible. As a result the lead particles in the glaze give rise to the discoloration. The remedy is readily seen to be more careful burning during the stage approaching fusion. A long period of clean oxidizing fire must precede fusion, so that all the lead is sure to be in the form of the oxide. In brown glazes colored with iron the color is changed to black if strongly reducing conditions prevail. The remedy is the same as in the preceding case.

#### —Rough Glazes.—

Easily melting glazes on a porous body, as well as glazes exposed to long-continued firing, give rise to this defect. In the first case the glaze has simply soaked into the body; in the second it has dissolved the clay substance and fine silica between the coarser grains of quartz, and has, so to speak, eaten into the body. The result is in both instances a very thin coating of glaze through which the quartz grains protrude. In the first case the remedy consists in adding silica or alumina, usually the latter, to the glaze, making it harder to melt,

or in grinding the body finer; in the second, in shortening the length of firing.

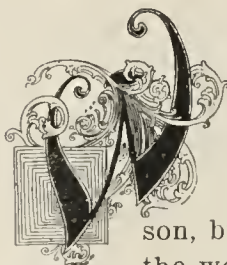
#### —General Remarks.—

In order to be successful in the glazed brick business, system and order should prevail in every detail. The composition of the glaze, as well as that of the body, should not be changed without important and well-defined reasons. The mixing and grinding should be done as thoroughly as possible. Cleanliness is a great consideration in this respect. The mills, preferably ball mills, must be kept as clean as possible. A cement floor, sloping towards an ample drain, and a hose with a good water pressure, will be found of great help in the grinding room. In dipping the slip must be constantly maintained at the same consistency, frequently controlled by either weighing a measured quantity of the slip, or by means of a hydrometer. Careless work in dipping must never be tolerated. Special attention should be devoted to clean trimming, which is best done by means of a carding brush. To refer back to the glaze slip, it must be ground so that it passes through a 150-mesh sieve without trouble. No faulty brick should, under any circumstances, be allowed to be set in the kiln. As to burning, the time should be kept the same as nearly as possible for every burn, especially the period between the fusing and finishing points. The temperature is best controlled by means of cones. The handling of the brick during all the stages must be done with the greatest care, and no poor work must be accepted. Finally, in the sorting and shading, a perfect system is to be maintained. In a modern front brick factory, where shading is carried to a point of perfection, this work will cause no difficulty. If the composition and the firing conditions are kept reasonably uniform, the variation in color will not be very wide.

AMERICUS.

Written for the CLAY-WORKER.

#### A BRICK FACTORY IN A WOODEN TOWN.—No. 5.



WE CAREFULLY examined into all our difficulties, and proceeded at once to stop some of the leaks. They were so numerous, and the plant had become so run down that it was a worse job than building a new factory. It was in the middle of the brickmaking season, but all manufacturing was stopped in order that the work of reconstruction might go on undisturbed. It was plain from the beginning that the plant could not be made what it should have been if intelligent plans had been adopted at first, but much could be done, and had to be done or give up the ship. We summarized our difficulties about as follows:

1. Our dry sheds were poorly constructed and of insufficient size.
2. Our kilns were bad and our burners worse.
3. Method of setting brick in the arches made it impossible to burn the top brick without melting the bottom.
4. Method of handling clay required too many hands.
5. General mismanagement.

Although we now dry our brick with fair satisfaction to ourselves, the question of drying is one in which we still feel deeply interested. We do not know that we adopted the best plan for our purpose and our clay, but after getting what information we could on the subject in a limited time, we concluded that an artificial dryer was too expensive for our purposes, and that the best plan for us would be to build large sheds and hack the green bricks there to dry. We had no demand for a finely finished brick, and though hacking marred the face of the bricks to a considerable extent, they sold as well in our market as a repressed or dry pressed brick. The demand here is for bricks for foundations, cisterns, cellars, caves, sidewalks and an occasional building. In all of the first named uses a rough brick is as good as a smooth one, but the quality has to be first-class. While in buildings they will



allow a goodly per cent. of salmon brick, and would prefer a fine front brick, but are not willing to pay for it. So in building sheds for natural air drying, and adopting the hacking system, we were simply aiming to meet the demands of our markets, and not aiming to educate the public taste for a more beautiful product.

This subject of educating the public taste and creating a demand for something new is not within the province of this series of articles. We may discuss that at some future time. I will simply state here that our business demanded something for immediate sale, and while we never lost sight of the fact that first-class quality was absolutely necessary to satisfy the demands of our granger customers, we knew they would not pay a farthing more for the most beautiful brick than for a common sand-molded brick. So we left the matter of fine ware for some future day, and felt we should be more than satisfied should we be able to make and burn a good hard, clear-ringing brick, no matter if the edges were somewhat marred in hacking. As stated before, our old sheds were miserable rickety affairs, covered with pine lumber, through which the rain poured in streams. Our first manager claimed they were good enough for brick sheds. In his "experience of ten years" he had had brick lie on the yard during a ten hours' rain, and still make good brick. They simply called them "rain-washed beauties," and sold them for as much as the best. Now this may have been true of hand-made brick—I never made any of them—but it would not do for our clay. Every leak cost us from ten to twenty-five bricks. They simply went all to pieces when water touched them. Our first improvement was a large shed that would hold 150 M bricks, with good roof, and doors at the sides suspended by hinges at the top. These doors could be raised or lowered at will, admitting more or less air as was necessary in the various stages of drying. Our clay was of a very tender nature, and would stand neither sun nor draft of air when first made. If it was damp weather or the air well saturated with moisture, our doors could be opened and no damage done. But in dry weather, and especially windy weather, our doors had to be closed and all draft shut out while the bricks were in the first stage of drying. Experience taught us when to open and shut these swinging doors as the drying proceeded. At the last the doors were swung wide open and the harder the wind blew the better our drying proceeded. I must admit that this method is far from satisfactory in all kinds of weather. For it sometimes happens that we have a wet season, and while we are perfectly safe from loss by the rain, still we often have to put up with vexatious delays when we really need the brick. To remedy this trouble we built a second large shed, making our drying capacity in dry weather more than we needed, thus giving us a reserve for the wet season. Another drawback to this natural air system in our climate is the shortness of the brick season. We commence making brick April 1st, and continue until November 1st. Now we often have very fine weather through the month of November, and it makes one impatient that he cannot see the wheels turning during such favorable weather. But he has to curb his desires and busy himself with putting matters in ship shape for the winter. But at this early-closing season we always aim to have our sheds well filled with brick so far progressed in drying that the freezes at night do not damage them. Most of our hands are turned off when the mill stops, and a few of us set and burn these bricks during November. Then comes four months with the works shut down and our hands scattered to seek other means of getting a living through the cold winter months. Of course this is not satisfactory to either employer or employe, but I do not believe there can be any help for it that will prove profitable to the manufacturer.

Brick can be made more cheaply during the summer months than in winter, and if the manufacturer can make enough during the summer to meet all his demands, it is certainly more profitable to run a summer yard than to run all year. I am

speaking now from the standpoint of the small manufacturer with a limited market. I advocate our system of drying as the cheapest from the same standpoint. The men who make many millions in one year and has access to the great markets knows his own environments better than I, and ought to know, or be anxiously seeking after the knowledge of what is best for his success. Our aim is to make the best brick possible from our clay, and make them cheap. We often sacrifice beauty of finish; but never sacrifice quality for cheapness. L. C. M.

Written for the CLAY-WORKER.

#### THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Fourteenth Paper.

BY E. G. DURANT.



PERHAPS THERE IS NO department of clay-working outside of regular and well developed lines of production that oftener comes to the minds of clay-workers as presenting a field as yet undeveloped than that of the manufacture of roofing tile.

While it is admitted by all who have made careful investigation in this field that beyond any other material clay possesses qualities, when properly fashioned and fired, that easily place it at the head of the list of various material used for roof covering, and that the field for its use is practically limitless. It is also seen that the parties engaged in its manufacture in this country may be more than numbered by the counting of one's fingers. Yet decided progress has been made in the industry in the past few years, and excellent goods are to be found in the market. Ohio and Illinois tile are being shipped in car lots to the Pacific coast, and are to-day being sold at as low a price there as they could have been had in Chicago three years ago. As yet, however, except it be in the immediate vicinity of a tile factory, the man who in building gives even a moment's consideration to the question of using them, is as one in a hundred.

The demand for a roof covering, as all who stop to consider it know, is enormous in its proportions. Almost every well built house, while yet in its prime, if it has been covered with a shingle roof—which is the rule—has had most likely its third covering, and in the meantime the occupants have suffered at least twice, and for protracted periods, the annoyance and losses occasioned by a failing roof before electing to pay for a new one.

#### —The Superior Qualities—

For which tile as a roof covering may be credited are several and pronounced. First to be named is the quality of resisting far beyond any other material frost and heat, in which quality slate and metal are conspicuously deficient. Second. The most durable of all material against any and all exposures to which a roof is subject, including fire; slate suffering severely from a heavy hailstorm and flying to pieces when exposed to the heat of a conflagration. And third, possessing a beauty of color, tone and form not approached by any other material employed. We are reminded here that the enterprising metal worker, who is furnishing our cornices, belt corners and trimmings to a noticeable extent, as well as interior finishes and decorations, is also taking a hand in supplying tile for roofing purposes that copy the popular form of clay tile. That such tile should find a ready market while standing at the head of the list is an heat absorbant and transmittant, and while requiring repeated coatings of paint for its preservation, can be only due to the fact of the desire to secure the general effect to the eye of a clay tile at a lower cost, and without taking into the account the superior qualities of long life and the non-transmission of heat and cold. Experience will have so demonstrated these lacks in metal that when clay tile are better



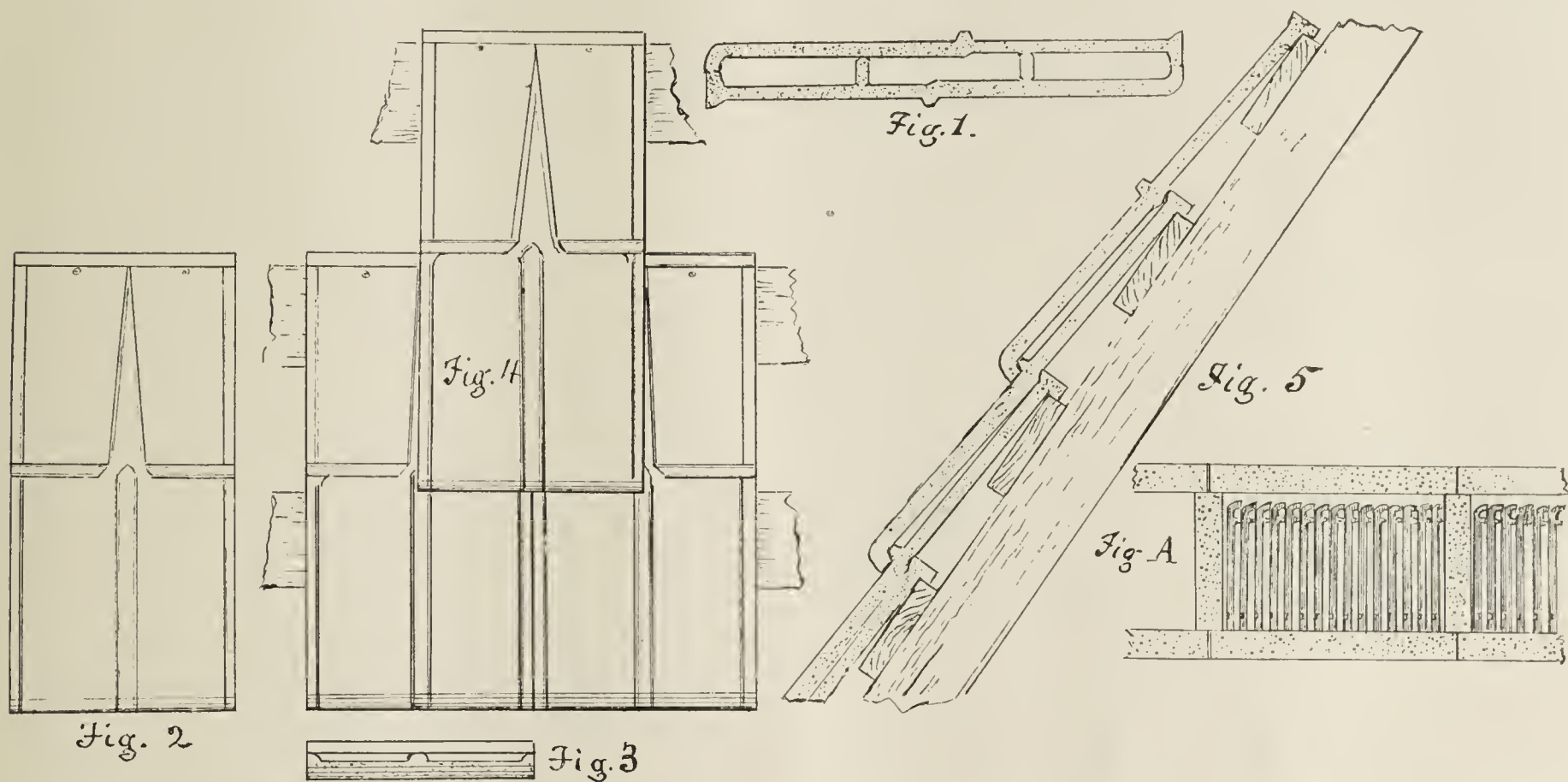
known and can be furnished at not too wide a margin of difference in price, they will take the field.

That there are difficulties attending the manufacture of clay tile is conceded. Much has been said pro and con in clay journals the past year concerning this, and many overstatements have been made on each side of the case. We will try to present the matter fairly as it appears to us.

In the first place, not all so-called "good clays" are suited to their manufacture. It is a mistake to suppose that either a good brick clay, or a good clay for drain tile purposes, will fill the bill. A clay that will make a good roofing tile will make a good brick, but not one time in ten, perhaps, will the reversing of the order of the statement tell the truth. What is requisite is that a clay be employed that will, when formed in a thin sheet such as a tile requires, stand up under a heat that will bring it to a semi-vitreous state, in order that the product may be of a reasonably water-proof character, and also a heat that will permit of glazes being applied. Preferably a clay in which little free silica is apparent, of dense, close texture, while yet subject to a minimum of shrinkage in drying and burning, and which, when well burned, shall be of a light or pinkish red color, since the darker shades can be had by the addition of various minerals. Still better results may be had

making methods could be continued, and the per centage of loss from handling, drying and firing be no larger, then the question of making roofing tile for the millions instead of the hundreds would be solved, but just here our difficulties and losses commence. It must be evident to all that a comparatively thin sheet of clay representing a superficial area of face of from three to six times that of a brick must be very carefully handled, and that any lack of skill or care in this regard must involve an injury to its perfect shape, which means its destruction, so far as its usefulness as a roofing tile is concerned, as the first essential of a good roofing tile is that it form a true joint when laid.

Great care must also be taken in the drying to prevent warping, and the drying facilities must be such as to secure uniform action of heat and air currents on all parts of the tile. The drying passed, consider the care required in moving to and setting in the kiln for burning of so thin and fragile a sheet of dry clay as is represented in a roofing tile. The process of burning roofing tile, as now employed, is necessarily a costly one. A mass of burned fire clay blocks, equal or more than equal in weight to the tile to be burned, must be employed in making pockets in which the tile must be set for burning, as shown in Fig. A. Fuel enough must be consumed to bring the whole



by the mixture of two clays, one supplementing the other in securing desirable color and glazing qualities. Many brick and drain tile clays will furnish a good body, with an addition of an average of 20 to 25 per cent. of plastic fire clay to insure the needed refractory qualities.

Good clays for the purpose being provided, it may be said that by the usual methods all is plain sailing up to the time the tile leave the hands of the molder. The processes are as simple as those employed in the manufacture of repressed brick, and are usually of precisely the same character. The clay must be thoroughly ground, preferably by dry-pan process, to insure uniformity, by passing through the meshes of a suitable screen, before being submitted to a thorough tempering and pugging, the pugged material passing from the mill to an augur machine, which forms it into blanks or thin sheets of the desired dimensions, which, when submitted to the tile press proper, shall be just sufficient to fill the molds. The tile press simply takes the place of the press used in repressing bricks formed by an augur machine.

If this was all that need be said of the processes of manufacture, and if from this point on the comparisons with brick

mass to the needed temperature for burning the tile. All that is taken from a kiln of pressed brick, save the small per cent. of loss from culls, is a marketable product, while over one-half that which comes from a kiln of roofing tile, after being twice handled and having absorbed one-half or more of both the kiln room and the fuel used, has no market value, and quite a further per cent. must be deducted for what the scrap pile claims. We have never heard of a claim of loss from wastes of less than 15 per cent as occurring between press and packing room, while we have heard more than once of average losses of over 50 per cent. (vide letter from tile manufacturer in your May issue.) From the best information we are able to obtain we think it may be safe to assume that this loss will run from 20 to 25 per cent. Hence it is that, including the cost attendant upon packing for shipment, roofing tile, as now made, must sell at a price, weight for weight, from eight to fifteen times greater than those obtained from good repressed brick, if made from the same clays, the prices ranging, say, from \$6 to \$15 per square for the tile, exclusive of the trimmings, and the brick ranging about the same per thousand.

We have recommended a clay that can be brought in firing



to a semi-vitrified condition, as saving, to a large extent, the necessity for glazing, for while glazed tile are listed at from 20 to 40 per cent. more than unglazed, there are many who would much prefer for beauty the latter, and, if needs be, at even a higher price, provided the tile have the requisite water-resisting qualities.

—You Are Ready to Ask—

“What has this talk about roofing tile to do with hollow blocks? You have lost your text, man.” Not so. We have been setting forth, as fairly as we know how, the present aspects and condition of the roofing tile business—its market, its methods, its advantages and its drawbacks, and also its competitors. The views expressed are not at variance with current literature concerning the business, but perhaps furnish a fair digest of the situation. The writer commenced the study of this branch of business, thinking it a natural ally of the hollow block business, believing that in the nature of things a large industry should be built up. Each monthly issue of the Clay-Worker and other clay magazines have represented the lights and shadows of the business. A magazine of the current month has taken up and analyzed the present situation, and as a result of recent investigation we are informed that of twenty-five concerns of some note that have embarked in the business in this country only four are now running.

We have been driven to the conclusion that the processes of manufacture now current are not what they should be, and, seeking for better methods, have satisfied ourselves, at any rate, that the future of the roofing tile business, as it concerns the masses of would-be and to-be users, is to be identified with the methods employed in the manufacture of ornamental hollow block. We hope we may make clear to the reader how such results may be accomplished. The party who is outfitted to make hollow blocks of an ornamental character needs only special dies and an automatic cutting table specially designed for the purpose to embark in this work. The clay best suited to the blocks is equally well suited to the manufacture of tile. Blanks for tile, to be finished later by repressing, have already been made from plain hollow blocks, each side of the block constituting a separate blank for repressing. Some of the most popular styles of roofing tile may not be made by the process we have in mind, but will be produced in the future, as in the past, just as some hand-made terra cotta will not be supplanted by machine-made, but we are convinced that in the natural order of things the great body of the people are yet to be supplied with tile roofing by the methods we now propose. It will be seen that just those features in roof tile manufacture which necessarily make it an article too costly for general use may be eliminated, and that this result may best be reached by combining its manufacture with that of hollow blocks, and, further, that the block manufacturer may accomplish this without the need of enlarging his kiln capacity and without the need of reducing his block output, provided only that he put in the necessary machinery for forming the tile, and slightly enlarge the drying facilities.

—The Hollow Block Route to Success—

in roof tile manufacture leaves the present terminal station of Cost-too-Much via the Common Sense Short-Cut Line to Simplicity, thence by the Straight Line road to Success, which, as all well-informed manufacturers know, is located in the immediate vicinity of Generaluse. To be more explicit, in Fig 1 may be seen an end view of a hollow block as it emerges from the augur machine, which, being automatically cut on a special table as it leaves the machine, into the required tile sections, represents also a side view of a pair of tile, tied together in part by the sections “A,” “A,” scored at their intersection with the tile body so that they drop out when the tile, in answer to a tap after being burned, are broken apart, proper scoring also having been done at “b,” “b” before leaving the forming dies.

Fig. 2 is a top view of one of the tile. Fig. 3 is a view of one

end of the tile, viz., the lower end as the tile is laid. Fig. 4 is a face view of several tile laid in position on the roof, while Fig. 5 is a side view of the tile when laid. There are several features in the manufacture of this tile well worthy of mention. First, the fact that two tile are produced at one operation, whereas, under ordinary processes, four separate operations and handlings would be required, two to each tile. Second, that two complete tile are produced in the same time that one blank is produced by ordinary methods. Third, that one machine takes the place of two. Fourth, that in the subsequent handlings to dry room and into and out of kiln the tile are handled in pairs, and not singly, saving not only one-half the labor in these processes, but, what is still more important, each tile holds the other in alignment during these critical periods of drying and burning, so that the per centages of loss from warping are sure to be reduced to a figure heretofore deemed and found to be impossible. The paneling and the configuration of the tile, such as the throwing up of the surface ribs on lines transverse to the flow of the block from the machine is performed by revolving dies used in the same manner as in the production of hollow ornamental building blocks. In designing the particular tile shown in these sketches three things have been kept in mind outside of the methods employed. First, the making of a tile that can be set inside of an  $8\frac{1}{4} \times 8\frac{1}{4}$ -inch hollow block, as in a pocket for burning, so saving the waste of heat and kiln space, heretofore referred to in this paper. Second, a tile so strengthened by ribs and cross ribs as to permit of the body of the tile being thinner than is made under the ordinary processes, and so that each edge of the tile presents quite a broad surface and hence one not easily indented from cross piling on cars for drying. Third, a tile sure to be security against the weather to an unusual degree. It will be noticed by reference to Fig. 5 that a double body of tile is to be found at every point, and at these points on every tile there is a triple lap. While this is true the tile can be made as light as any that will make an equally tight roof, and, we think, lighter.

Tile as found in the market vary in weight from about 700 pounds to the square to near 2,000 pounds. A good, plain “shingle tile,” as ordinarily made, will weigh from 1,000 to 1,100 pounds, while the tile here illustrated will weigh but 800 pounds, which is a little less than slate of the same size, and will require no use of cement, which many tile demand to render the roof water tight. Indeed they may be depended upon to make as tight a roof as the best and highest-priced tile made, and, further, the laying of them, except, perhaps, at gutters and hips, will require no more skill than the proper laying of a shingle roof. This is a most important feature, and one essential to the wide distribution and general use of tile.

So long as it is necessary to pay for the time lost in passage and the traveling expenses of high-salaried professional experts, when a job is to be done outside our larger cities, a large trade cannot be established for this line of goods.

The style of tile presented in this paper is but one of several which may be produced in the use of the methods employed in their manufacture.

**DON'T KNOW IT ALL.**

Be like a sponge. Absorb ideas from everybody with whom you come in contact. You can learn something from the humblest, some crude facts if not some ideas. The man who is himself the all-sufficient source of his own knowledge cannot expect to keep abreast of the progression in his line of business. He is a shrewd business man who is ever taking in but never giving out information. One of the largest carpet mills in this country was started from a tip given by an innocent solicitor for foreign carpet manufacturers. He carelessly announced a plan of his employers to start carpet mills in this country. He was soliciting business from the man who turned out to be a future competitor. This man had a habit of giving an audience to every solicitor who called, and he always turned the conversation in such a way that he learned something of more or less value. He never let anything good get away from him. He was never too old to learn. So the successful business man is in one sense a bundle of hooks and eyes.—Advertising Experience.



Written for the CLAY-WORKER.

THE THUNDER BIRD.

BY MRS. MARY E. NEALY.



INCE I FORTUNATELY became the proud possessor of the quaintly beautiful set of tiles which combine to form the figure of this mysterious bird, I have made quite a study of his history, his attributes, and the faith which seems to float about him in the tradi-

tions of the majority of the Indian tribes of America. From the "Myths of the New World," by Dr. Daniel G. Brinton, are many legends and notes regarding birds, this part of the creation being held in the highest reverence by many tribes of red men. In their minds birds are spirits, light and airy, and free from the attributes of grossness. Like angels, they float far above the earth, and even while here in this life they share the joys of the angels. In their religious rites they form one of the most attractive powers, and are held in superstitious awe. These traits are exalted or modified in different nations according to the differences in their religious forms and beliefs.

In their myths of the creation the birds play a conspicuous part. They typify the winds and the clouds, and especially the dark thunder-cloud charged with fire, the lightning sent by the gods and yet accessible to man's most holy uses, preserved as it is in the thunder-bolt.

Some hold that this great bird presides over the destinies of the human race as a priest and a god only. Others that he controls the elements and man through the elements. But in all their prayers and invocations he is still the presiding genius.

The Chickasaws and Mandaus of the Missouri, the Pueblos of New Mexico, the Muyscas of Brazil, the Araucanians of Chile, and other tribes, believe man was descended from a raven, the same mighty cloud-bird who in the beginning had seized the elements and brought the world up from the abyss of the primitive ocean.

The Dakotahs believe that the noise of the Thunder Bird was the struggle between the God of the waters and the great bird for the command of the nation. The Sioux called their thunder god "Haokah." The four winds were his servants, one of which, being the drum-stick, produced the thunder.

In some tribes the clapping of his wings was thought to produce the storms, the lightning and the rains, and he is also one of the gods with the power to answer prayer and to grant the blessings of life. Some give him the form of a serpent with the large wings of a bird.

\* \* \*

The Thunder Bird given by the poet Longfellow in "Hiawatha" is altogether a different kind of a magician. His name is "Pan-Puk-Kee-Wis," the mischief-maker.

"He, the handsome Yenadizze,  
Whom the people call the Storm Fool,  
Vexed the village with disturbance.  
You shall hear of all his mischief,  
And his flight from Hiawatha,  
And his wondrous transmigrations  
And the end of his adventures."

Then the story goes on for many pages; "how he killed the mountain chickens" of his neighbor, Hiawatha, and how he scattered all the treasures of the lovely Minnehaha; how he gambled with his neighbors till he won their chiefest treas-

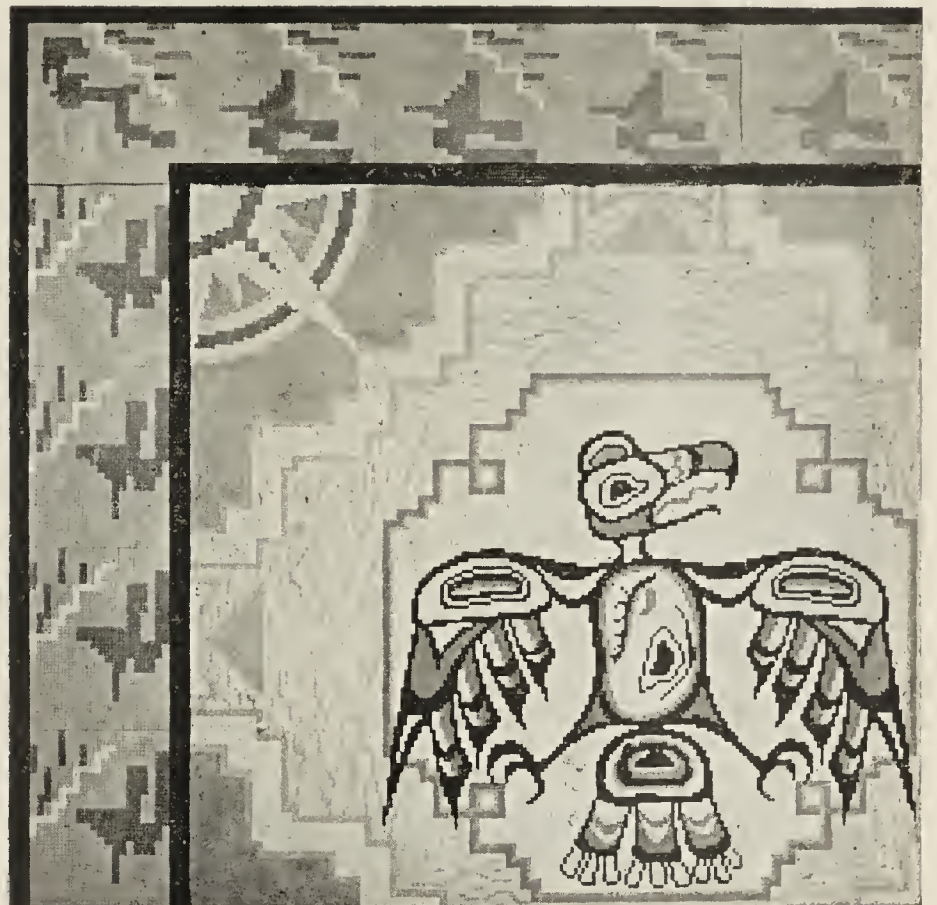
ures; how he changed his form and fooled them till he set them wild—his neighbors; and the wise man, Hiawatha, gathered up his friends and neighbors, vowing by his gods to kill them. He called upon the tempests,

"Called Wawassimo, the lightning,  
And the thunder, Annemeekee;  
And they came with night and darkness,  
Sweeping down the Big-Sea-Water  
From the distant thunder mountains.  
And the trembling Pan-Puk-Kee-Wis  
Heard the foot steps of the thunder,  
Saw the red eyes of the lightning,  
Was afraid and crouched and trembled."

\* \* \*

Hiawatha had the power to kill his body, but he could not kill his soul, so he gave him this sentence:

"You shall soar and sail in circles;  
I will change you to an eagle,



THE THUNDER BIRD, Executed in Mosaic Tile by the Mosaic Tile Co., Zanesville, Ohio.

To Kenen, the great war-eagle,  
Chief of all the fowls with feathers,  
Chief of Hiawatha's chickens.

ITALIAN CLAY DIGGERS KICK AT WINSLOW JUNCTION, NEW JERSEY.

Editor Clay-Worker:

Owing to a strike among the Italian clay diggers at the St. Louis Hydraulic Brick Company's branch at Winslow Junction, Camden county, N. J., nearly 500 of the men are forced to work on half time.

The strikers to the number of 68 have hitherto worked for \$1 a day. On the 15th of this month they decided that this amount was not sufficient to keep up their supply of "Ckianti" Macarroni, so they approached the boss and demanded, with a voice full of suppressed emotion and tobacco juice, and armed with huge sticks of macarroni:

"Youd giba us one-a dollar an' twenty a centa. When you-a no giba, we no more-a worka, see-a!"

Their demands were refused, when to a man they marched out, and sat on the fence rails until a new contingent arrived from Camden and Philadelphia. The new arrivals worked for half a day, when they, too, marched out and joined the



strikers. A long conference took place between the two Chianti tipplers—with the result that they made solemn pledge one with the other not to accept less than \$1.20 per day, each one giving his companion liberty to kill him if he went to work for less.

The compact was to have been signed on the 24th, and signed

water. So the compact signing was delayed.

Nevertheless the Winslow branch and the 450 men are almost at a standstill, and the big orders waiting to be filled.

"Oh why will these Eyetalians do such things. I don't think they ought to be allowed to live," said the old lady who keeps a boarding house near the works. It makes a difference whose ox is gored. It is hoped that the difficulty may be amicably settled soon, so the brickmakers can resume full time.

W. P. L.

Written for the CLAY-WORKER.

#### A VIRGINIA BRICK AND TILE YARD.

FOR A long time I have been promising and intending to pay a neighborly visit to Mr. A. C. Larson, a fellow brickmaker, whose yard is some five miles from ours, so finding things in good easy running order on my own yard one sunny day in June, I concluded it was a good time to go visiting and coaxing my special favorite "Betsey" to accompany me, I hitched up my favorite driver "Dan" and made the trip which proved a very pleasant one going, but it was a little different returning, owing to our trying a new road, suggested by Mr. Larson. It led through the woods and was delightful for a mile or two, when it lost itself and us too. Its disappearance was so gradual that we did not miss it until it was gone, for all the world like some brickmaker's capital. We had gone too far to turn back, so forged ahead and after jumping a washout and a couple of railroad cuts, which tried the nerve and metal of both favorites, and narrowly escaped a bear trap in the shape of an old well, "Dan" finally brought us safely home.

Arriving at Mr. Larson's plant we were cordially welcomed and given the freedom of the place, in such a kindly way as to make us feel at home. I took my trusty camera along and the accompanying views will give you a better idea of the situation than any description I can give.

Mr. Larson came to Suffolk in 1889 from Wisconsin and bought twenty acres of clay land one and a half miles below Suffolk on the A. & D. R. R., where he started a new plant, putting in a Michigan Brick & Tile Machine Co.'s machine No. 2, with racks for drying and permanent kiln walls for burning. He has a twenty-five horse power boiler and engine and makes 8,000 brick per day, and quite a good many tile, from two to ten inch. He makes 700,000 brick and 100,000 tile each year. The brick are shipped by rail to West Norfolk and Portsmouth, where they find ready sale at \$5.00 per 1,000 on cars at yard. There is a side track to the kilns, also a creek for shipping by water. There is four feet of red clay and two feet of blue clay under it, which is made into buff brick and tile. Mr. Larson's son Louis does most of the setting and Mr. Larson looks after the machinery and manufacturing, also the burning and general management of the plant, without going to the expense of having a foreman, setters and burners. Mr. Larson is a hard worker and is very popular among his fellow craftsmen in this section. I had a very pleasant time while at his works. The machine was at work, and they were loading a car of brick for shipment; also getting a kiln of 170,000 ready for burning. He burns with pine cord wood which he gets by rail and can unload right at his kilns. His residence is only a hundred yards from the plant, thus making it very convenient for him.

H. L. JACOBS.

Suffolk, Va., 7-5-'98.

Industrial activity in the United States is far more general and vigorous than the chronic growler is willing to admit. This is a big country and a great deal of business can be going on without any particular stir or noise being made about it. Elephants fail to perspire under light loads. In the State of New York not less than 1,390 new manufacturing concerns have started in business this year, and 1,560 old firms that had closed their doors have started operations again. Some 400 manufacturers applied for permission to run their plants overtime.



A VIRGINIA BRICK AND TILE YARD—A. C. Larson and his Stock of Drain Tile.—Two Favorites.—Part of the Drying Sheds.

in blood, ink being a non-purchasable liquid at Winslow Junction.

The stealthy stilleto was drawn and the victim brought forward for pricking. All crowded around, all eager to dip the pen in the ruby fluid. The lowering clouds threatened a heavy downpour no time was to be lost. The drops of rain commenced to fall. Excitedly they waited. Where is the blood a? The victim, deathly pale, gave none; fear had turned it all to



and 50,000 extra hours of labor is the record of these firms. In comparison with the figures of 1897 some 40,000 more persons are now employed than in that year. Instances of a like nature might be multiplied in which the hands employed by some firms have been nearly doubled, one steel company alone adding 1,300 men to its pay roll. We have reached the turn in the lane at last.—Age of Steel.

#### EFFLORESCENCE (WHITWASHING) OF BRICK.

**T**HIS SUBJECT has often been brought up in conventions and has also been pretty thoroughly discussed in the Clay-Worker in the past. Yet it will not be kept down, I suppose, as long as the trouble exists. The writer remembers of keeping a professor of chemistry on the stand for nearly three hours at one of the N. B. M. A. conventions, in order to draw out all the points on the subject and learn of a remedy, but alas, when through we were very much wiser in regard to chemical terms, but had not learned where to look for the cure. Let us look for the cause of the burnt article turning white on the surface. This occurs mostly after brick are put in the walls. However, some come out of kilns marked white. This is often caused by the fuel in watersmoking. I know in one instance where coke was used for that purpose and the brick came out of kiln badly mottled with white spots. Changing to wood for the first firing or watersmoking remedied the trouble completely.

First and foremost we all know, that brick do not often whitewash in walls which are but slightly exposed to moisture. When I say moisture, I mean pretty strong saturation by water. A slight sprinkling of the surface occasionally does not bring out the efflorescence to any perceptible extent. This teaches us that only a thorough saturation brings out this obnoxious eyesore to the surface. Often wetting with spring or well water does not bring out the whitewash, while rain water will.

This shows that there are elements in the rainwater which act strongly as solvents on the soluble alkalies or nitrates in the burnt ware. The question is often asked, "What is the matter with my clay that makes the brick white wash in the walls"? Shall we say, that there are certain soluble alkalies nitrates, etc., in it or can we look for other causes. In some instances it may be a relief to know that these bothersome elements are not always to be looked for in the clay, when made into brick and put in walls. Often the clay is devoid of the whitewashing elements. If that is the case, how does it get in? Actual experience has proven that it was brought in with the water used for moistening the clay. A change from spring water to well or pond water proved that the soluble elements came in with the spring water first used. This does not mean that spring water always proves injurious in this direction as springs differ so much in their chemical contents, as ponds, wells and rivers or clays from each other. We see that the bad elements in the burnt brick, therefore, may have two sources. But there is a third. In many instances the whitewash is not in the clay bank or in the water used for the manufacture. If in this article I can not offer a universal remedy against whitewashing, I may, however, in this third solution, help the brick man to wash his skirts, by blaming the mortar used in the blanching walls. Mortar, in many instances, contains the solubles which mark the brick work on the outside. This is a good point to make when complaints come in. It reminds me of an old miller I once knew, who always replied to customers who found fault with the quality of his flour in making bread. "Throw away your durned old yeast." Always lay it on the mortar. It is a well known fact that good mortar is a pure silicate of calcium. This is a mixture of clean sand or pulverized quartz, pure silicate and pure lime. Now here are two elements, either of which may contain soluble salts which show white on the outside of brick walls. Sand seldom is altogether pure. It contains outside elements. These foreign substances make the mortar weak and porous and prove a ready entrance for water to bleach out the whitewash. The limestone also is seldom a pure carbonate of lime, hence here again may enter the bad elements under discussion. But where is the remedy? In answer I will confess that I know of no universal remedy, further than to act upon the hints given above so far as they go. Experiments have proven that when the chemical substances which cause the whitewash in the brick, enter into them through the clay or mortar used, the several com-

binations of the mineral barium, principally that known as baryta (oxide of barium) cause the solvents to combine and become fixed, so that water will not dissolve them. This is an abundant and cheap mineral in some parts of America, however too expensive to use in large brick factories. It is a help to clayworkers in a small way, near the place where found, but is



A VIRGINIA BRICK AND TILE YARD—The Kiln Sheds.—A Good Kiln.—Runway between Drying Racks.

out of the reach of those who are at a distance and where large quantities are required. We shall have to bear with the evil some time yet, I fear, and when the whitewash on the walls must be removed, to apply the sponge with acidulated water.

F. E. FREY.



Written for the CLAY-WORKER.

# ANGLO-AMERICAN POTTERY. No. 5.

## Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

WILLIAM ADAMS.

**A**POTTERY WAS FOUNDED at Stoke-upon-Trent early in the present century by William Adams, which he operated until about 1829, at which time he took his two sons into partnership, under the style of William Adams & Sons. About five years later larger works were established at Tunstall. The dark blue designs relating to America were produced at the Stoke establishment. Those in other colors, of a later period, were, doubtless, made at the Tunstall works.

### AMERICAN DESIGNS PRODUCED BY W.M. ADAMS.

—Designs in Dark Blue. Border, Foliage.—

Mitchell & Freeman's China and Glassware House, Chatham Street, Boston.

W. ADAMS & SONS.

—Designs in Pink, Black, Red, etc. Border, Floral (roses in baskets). Mark, Cornucopia and Eagle.—  
Catskill Mountain House, U. S.



NEW YORK, BY ADAMS.

Conway, N. Hampshire, U. S., View near.  
Falls of Niagara, U. S.  
Headwaters of the Juniata, U. S.  
Monte Video, Connecticut, U. S.  
New York, U. S. (horseman in foreground).  
Schenectady on the Mohawk River.  
Shannondale Springs Virginia, U. S.

W. ADAMS & SONS.

—Designs in Pink, etc. Border, Medallions Containing Sailor Boy and Ship.—

New York (view from river).

ADAMS (W. A. & S.).

—Designs in Red, Purple, Green, Black, etc. (Found on various pieces of Table Services). Border, Animal Medallions and Roses.

Columbus, 1 (Fleet View), Columbus and companions, six Indians, two caravels and boats.

Columbus, 2 (Cavalry View), Columbus and attendant, five Indians and mounted soldiers.

Columbus, 3 (Camp View), Columbus and horse, two Indians, four tents.

Columbus, 4 (Indian View), standing Indian and seated squaw, vessel in distance.

Columbus, 5 (Grayhound View), Indian and three dogs, two tents and boats.

Columbus, 6 (Hunting View), standing and seated native, former shooting wild goose.

Columbus, 7 (Pavilion View), two circular tents, three white men and three Indians.

ROGERS.

Previous to 1815, Messrs. John and George Rogers had an ex-



HANCOCK HOUSE, BOSTON, BY JACKSON. Courtesy of Godey's Magazine.

tensive pottery at Burslem, England. In the year mentioned the latter died, and the former's son, Spencer, was taken into partnership by his father, under the firm name of John Rogers & Son. A year later the senior member died, but the firm name continued to be used until 1842. Spencer Rogers produced a superior quality of table ware, and among other things issued several American designs, some of which are marked with the name of Rogers, though the majority of pieces bear no maker's name. Those known to have been made at these works are as follows:

### AMERICAN DESIGNS PRODUCED BY ROGERS.

—Designs in Dark Blue. Border, Floral Design.—

Boston State House (chaise in foreground).

Boston State House (cows in foreground).

Boston State House (without chaise or cows).

E. & G. PHILLIPS.

Very little is known of this firm, except that they had an



GIRARD'S BANK, PHILADELPHIA, BY JACKSON.

important pottery at Longport, Staffordshire, previous to 1830. They do not seem to have manufactured extensively for the American trade, but at least one design is known bearing their mark.



—Design in Dark Blue.—

Franklin (tomb).

J. & J. JACKSON.

This firm occupied the Chuchyard Works, Burslem, England,



WATERWORKS, PHILADELPHIA, BY JACKSON. Courtesy of Godey's Magazine.

previous to 1843. They made a considerable number of copper-plate engravings of subjects relating to the United States, which they printed on table ware for American consumption.

LIST OF AMERICAN DESIGNS PRODUCED BY  
J. & J. JACKSON.

—Designs in Red, Light Blue, Lilac, Black,  
Brown, etc. Border, Floral Design.—

Albany, N. Y.  
Battle Monument, Baltimore.  
Boston, Hancock House.  
Boston, State House.  
Hartford, Conn.  
Harvard Hall, Mass.  
Monte Video, Hartford.  
Newburgh, N. Y.  
New Haven, Yale College and State House.  
New York, Battery and City of.  
New York, Castle Garden.  
New York, City Hall.  
Philadelphia, Girard's Bank (from engraving published by C. G. Childs, Philadelphia, 1829).  
Philadelphia, The Race Bridge.  
Philadelphia, The Waterworks.  
Richmond Court House.  
Richmond, Virginia, at.  
Saugerties, Iron Works at  
Schenectady, N. Y.  
Washington, the President's House.  
"White Sulphur Springs, Town of Delaware, Ohio, 22 miles from City of Columbus."

THOMAS GODWIN.

Contemporary with the Jacksons, and one of their neighbors, was Thomas Godwin, of Burslem Wharf. He issued several American views, belonging to the same period. These are generally marked "T. Godwin Wharf," a combination of name and place which has occasioned some confusion in the minds of collectors as to the name of the maker.

LIST OF AMERICAN DESIGNS PRODUCED BY  
THOMAS GODWIN.

—Designs in Green, Brown, Light Blue, etc. Border, Convulus and Nasturtium.

Baltimore, City of.  
Brooklyn Ferry.  
Fort Hamilton, the Narrows from.  
Washington, The Capitol.

THE COST OF AMMUNITION.

One of the Enormous Expenses of Modern Warfare.

If no men were lost, if no ships were destroyed or even damaged, it would cost \$2,000,000 or \$3,000,000 for ammunition alone to fight a first-class battle with modern arms and projectiles, and a large part of the \$50,000,000 appropriated by Congress will go for powder and shot. An ordinary allowance of ammunition for one of the big guns costs about as much as the gun itself, and any one can realize that we will need an enormous amount of powder before our navy goes to war for it takes nearly a half a ton every time one of the big thirteen-inch guns is fired. There were 250 tons of powder on the Maine when she went down and her magazines were only half-filled. The big battleships and the first-rate cruisers should never go into action without a supply of from 500 to 800 tons, or, say, an average of 700. There are eleven of these battleships, which together require 7,700 tons. Then there are sixteen second-rate ships which ought to have 500 tons each in their magazines, or a total of 8,000 tons; forty-two third-rate ships which would require at least 300 tons each, or a total of 12,600 tons, and seven fourth-rate ships which should have 200 tons each, or a total of 1,400 tons. Without counting the torpedo boats, it requires about 30,000 tons of powder to fill the magazines of our navy before it would be safe to send the ships into action.

The seacoast defenses, with their monstrous eight, ten and twelve-inch guns require several times as much. The four-inch rapid-fire rifle requires sixteen pounds of powder to carry



VIEW OF THE CITY OF BALTIMORE.  
BY T. GODWIN. Courtesy of The New England Magazine.

a projectile weighing thirty-three pounds four miles. The five-inch gun requires twenty-five pounds, the six-inch rifle



fifty pounds, the eight-inch rifle 250 pounds, the ten-inch 500 pounds, and it costs \$1,000 every time one of the thirteen-inch rifles is fired. There are four of these guns each on the battle-ships Indiana, Iowa, Massachusetts and Oregon.

A few weeks ago the ordnance department of the army made a contract for 5,000 loaded shells at a cost of \$600,000, and within the last few days contracts for 11,000 more shells have been made at a cost of \$1,250,000. There are four factories at which these shells are made. A four-inch shell loaded weighs seventy-five pounds; five-inch, ninety pounds; six-inch, 110 pounds; eight-inch, 325 pounds; ten-inch 525 pounds; twelve-inch, 900 pounds, and thirteen-inch, 1,100 pounds.

### THE CLAYS AND CLAY INDUSTRIES OF NORTH-WESTERN INDIANA.

BY W. S. BLATCHLEY.

NEWTON COUNTY comprises 400 square miles of north-western Indiana, lying adjacent to the Illinois line, north of Benton and west of Jasper counties. The Kankakee river forms its northern boundary and drains the northern half of its area. The Iroquois river flows across the southern half of the county from east to west. It forms the northern boundary of that magnificent prairie region which embraces the southern third of Newton and all of Benton counties. North of the Iroquois are also some fine prairies which extend to the southern border of McClellan and Colfax townships.

With the exception of about 25,000 acres, formerly comprising Beaver Lake, the surface of the four northern townships of Newton county is covered with loose sand. Up to the present this sandy area has been deemed comparatively worthless for agricultural purposes, but the time will soon come when, by proper cultivation, it will be made to yield handsome returns in small fruits and certain vegetables. The area covered by Beaver lake was long since drained into the Kankakee and now comprises one of the most productive regions of the county.

The clays of Newton county are, all of them, drift clays or marly clays. They were deposited either by melting ice or by the still water of the numerous shallow lakes which for centuries immediately following the glacial period covered the greater portion of the county. In many places they cover the uppermost rocks to a depth of 120 to 150 feet, and in but a few known places are they less than 10 feet in thickness. The northern third of the county was not visited since it is so covered with sand and lacking in railway facilities for transporting clay products. The fine-grained blue clay common to the region will doubtless be found to underlie all of this sandy area to a great depth.

In the vicinity of Kentland there are no clay factories, and no openings where the strata of underlying clay are exposed. The record of the well in the public square shows the blue glacial clay to be 146 feet in thickness. At Kent's warehouse it was 80 feet, and on Kent's farm, two miles southwest of Kentland, section 29 (27 north, 9 west), 50 feet in thickness.

A brick yard was for some time located on the north side of the Iroquois river, where the road running north from Kentland crosses that stream, southwest quarter of section 34 (28 north, 9 west). The clay is yet exposed in a cut by the roadside to a depth of five feet. It is a fine-grained, reddish, loamy clay, free from pebbles and lime, and will withstand much heat when burned. It should make excellent ordinary brick, but is not suited for drain tile on account of the large amount of free silica which it contains.

At Morocco in the south half of section 21 (29 north, 9 west), Darrach Bros. have been operating a brick and tile yard for four years. The firm have their plant very well fitted with machinery, but are unfortunate in the selection of their clay. Seven inches of soil is stripped and three feet of brownish drift

clay is utilized. It is very full of lime pebbles, and for that reason the tile and brick are of poor quality. One hundred yards north of their plant the blue clay comes within five feet of the surface and will make much better tile, but they will be yellowish-white in color. Two well sections at Morocco show this blue clay to be 113 and 120 feet in thickness, very fine-grained and very plastic.

A much better clay for tile and brick-making occurs at Beaver City, and has been worked by M. E. Handley since 1893. The section at the pit is as follows :

1. Soil—stripped ..... ½ foot.
2. Yellowish sandy clay.....3½ feet.
3. Tough, bluish clay.....4½ feet.

Wares made from the above yellowish clay air crack in drying, especially if exposed to the wind. When the yellow clay is mixed with the blue this is prevented. The blue clay has been proven by a bore to be 140 feet in thickness. But little trouble is had with lime pebbles, as comparatively few are present. The clay is thoroughly moistened, pugged and crushed before entering the machine. The mixture burns red, and the owner claims that red tile sell much better than white, as they stand freezing better. Tile from 3½ to 12 inches in size are made and more were sold in 1897 than any year since the factory was started. The brick made are of fair quality and bring \$8.00 per thousand at the yard, but the local demand is small.

At Mt. Ayr, on the La Crosse Branch of the C. & E. I. Railway, a grayish-blue comes close to the surface in a marshy field in the eastern outskirts of the town, and is worked into brick by Stucker & Covert. It is fine-grained and tough, but contains occasional botryoidal masses of pure amorphous carbonate of lime the size of a marble or smaller. No two pebbles of lime are found in the clay and a similar occurrence of amorphous lime was noted nowhere else in northwestern Indiana. The clay itself possesses scarcely enough lime in its composition to cause an effervescence with acids, and burns a bright red. Four to six feet of it are used, the deeper portions burning to wares of a lighter color. About 25 kilns of a good quality of tile are made at this factory besides enough brick to supply the local demand. If the lime above mentioned was absent, the clay would be of most excellent quality for drain tile, blue linings and fire-proofing.

The J. H. Haynes Company, of Brook, have the largest and best-equipped clay factory in Newton county. Their clays are also excellently suited for the wares which they are making. A section at their pit, northwest quarter of section 30 (28 north, 8 west), showed as follows:

1. Black soil.....1 foot.
2. Yellowish loamy clay.....2 feet.
3. Grayish or drab, marly clay.....3 to 6 feet.
4. Tough blue marly clay.....2 to 5 feet.
5. Gravel and Sand.....? ?

The entire deposit was evidently laid down in still water instead of being dropped by melting ice. As a consequence but little trouble is experienced with lime pebbles. From a portion of the soil and the loamy clay—No. 2—ordinary red brick and drain tile were made for a number of years. In 1895 the company begun to utilize the upper marly clay—No. 3—in making terra cotta lumber for the Chicago market. This clay is a silt, the lower part of the stratum being in thin layers with a coating of sand between them. An incomplete analysis shows that it contains about 10 per cent. of magnesium and lime carbonates. In the making of terra cotta lumber three parts of clay are mixed with one part of sawdust. The mixture is passed through a pugmill and crushed, and then through an Adrain tile machine fitted with dies of the proper pattern for the product desired. The so-called lumber is in reality a hollow brick, 12x12 inches square and 3, 4 or 6 inches thick. The walls are three-fourths of an inch thick and the hollow portion has two partitions to give the structure additional



strength. At the present time the brick are dried in sheds for six to eight days, but a tunnel dryer will soon be constructed. After drying they are burned for 36 hours, and, the sawdust being consumed, leaves the product very light and porous, but at the same time strong enough for all purposes for which it is used.

On account of the porosity, this "clay lumber" can be readily sawed to any desired shape, and a nail can be driven into it with as much ease as into a pine board. It is used mainly for partition walls in fire-proof buildings, and is rapidly taking the place of ordinary brick and solid fire-proofing for that purpose. Its advantages over the latter are obvious. On account of a grooved outer surface, plaster is spread over it without the use of intervening laths. Any wood finish can be nailed directly to it; while with a saw or trowel it can be quickly cut into any desired shape. Its weight is as follows:

|             |                                    |
|-------------|------------------------------------|
| 3 inch..... | 13,500 lbs. per 1,000 square feet. |
| 4 inch..... | 15,000 lbs. per 1,000 square feet. |
| 6 inch..... | 20,000 lbs. per 1,000 square feet. |

The prices at which it was sold in 1896 were \$27.50, \$30.00

caustic tile and terra cotta. Both are very fine-grained, free from grit and pebbles, and exceedingly tough and plastic. The clay at Goodland effervesces rather freely with muriatic acid, showing that it contains several per cent. of lime carbonate, while on that from Owen county acid has no effect. The latter is, therefore, much the more refractory.

The section at the clay pit at Goodland was as follows:

1. Soil.....1 foot.
2. Grayish pebbly hard pan or drift clay.2 to 3½ feet.
3. Pink clay.....4 to 10 feet.
4. Blue clay merging into shale.....5 to 8 feet.

The pink clay covers a large area southeast of Goodland, southwest quarter of section 25 (27 north, 8 west), on the land of W. J. Stewart. Burned by itself, it produces ware of a dark-red color. Mixed with the overlying grayish clay, it burns brown. Drain tile made from it are very hard and ring when struck, as though composed of iron. On account of its tough, plastic condition it is apt to twist and shrink under the influence of great heat. It must be thoroughly moistened in a pugmill, as it is too tough to work dry. When properly tempered or weathered it does not air-crack in drying. It possesses all the properties of an excellent, modeling clay, and is



Yards and Works of the J. H. Haynes Co., Brook, Ind.

and \$35.00, respectively for the sizes made, delivered in Chicago.

From the blue clay, No. 4 of the section, flue linings, solid fire-proofing, furring brick and foundation brick are made. This clay, as well as No. 3, burns to a cream color on account of the large percentage of lime which they contain. With a better system of drying their wares, and with a few additional kilns, this company will have their plant in excellent condition to meet almost any demand. Their trade is constantly increasing, as they aim to make all their products of the best possible quality and sell them at reasonable prices.

The Goodland Tile Company has been making brick and tile at Goodland, in the southeast corner of Newton county, for 12 years. The clay which is mostly used is peculiar for this region of the State, in that it is a pinkish-red in color. It resembles closely the clay of the same color found near Freedom, Owen county, which is quite largely used in the making of en-

of too high a grade to be used only for brick and drain tile, as it is at present.

The Goodland company have a very well equipped plant, but in the past have made many poor tile from the upper pebbly clay, and have thousands of them on their yard. Besides drain tile and ordinary brick, they make solid fire-proofing, hollow brick and foundation brick. Of ordinary brick their output is only about 100,000 per year, which they sell for \$8.00 per thousand at the yard. In 1896 they made 55 kilns of drain tile, but in 1897 the long strike among the coal miners shortened their season and they produced less than half as many.

From what has been stated it will be seen that the clays of Newton county are more varied in character and of better average grade than those of Benton. Good deposits of marly clay, suitable for terra cotta lumber, doubtless occur along the Iroquois river, east and west of Brook. Three railways pass through the county and its proximity to the coal fields of both Indiana and Illinois renders cheap fuel a certainty. There is no reason why larger clay industries should not start up and flourish especially at Goodland and Brook.

(To be continued.)



Written for the CLAY-WORKER.

### BRICKMAKING ON THE HUDSON.



ATURE SPREAD throughout the world clay of various kinds. It is so located that the cost of exposing it so that it can be manufactured into brick is done at a small cost, and is one of the reasons why so many look on the brick-maker as one who is always "coining" money, on the basis that he has his clay furnished to hand. Lucky is the man who has a good bank of clay, that is, a bank which is above the water level, as it saves the expense of a pump, and is always dry. The powers which made the clay to form made some very high banks of it on the upper Hudson and South New Jersey. At the time of formation it was not in demand for brick. If the future use for it was known, it would seem that locality and not grade was considered, so that the future manufacturer of common brick would not have any trouble with water. The brick made from clay from the higher banks do not command as high a price in the market. Jersey and North River clays are of different natures. In the past, clay was formed quite extensively in the pocket, so to speak, at Haverstraw, beginning at the foot of the long bend, or on the spot where Andre landed to meet Arnold, and reaches to Stony Point. In that distance of three miles there are a number of banks of clay, all of the same nature, soft, but not all of the same grade.

#### —Top and Bottom.—

Banks as found below the town are not different in grade, only that the bottom is slightly softer. If any one who had lived in Haverstraw, or visited that place forty years ago, was to see it now they would see such a change in the formation of the land that would seem impossible for six brickyards to make. The town is probably forty feet above the level of the Hudson river. From the town to the south yard it used to be about level the whole distance. The clay on water level formed a bank at least fifteen to twenty-five feet or more in height, with lots of sand on top, which had to be stripped off each fall and spring to uncover the clay for next season's use. The earlier leases made all the brick of top clay, and the brick made called for the highest price, strong and good. In time more brick were made to a machine, and the top stuff was well worked back, and they started to sink, about ten feet being the limit. The pump that used to take out the water was a tin one, with man as the motive power. Still later they went deeper; the pump used was worked by horses. A few years later they took out the clay they had left in former years, and deeper still they went, when they cut through, and it required steam to keep the water down. As the different yards had their bank quite a distance from the yard, they found that the bottom was very uneven, and at times would strike a spring and would have to vacate the bank. About eighteen years ago the clay was exhausted on the property, when the owners built a coffer dam, taking in a portion of the river from which clay is now taken, and pumping is required all the year through.

#### —Another Grade of Clay—

Is found, beginning at the north line of the town, now owned by the Excelsior Co., for a space of nearly a quarter of a mile in length. All who made brick on this section thirty years ago met with financial loss, simply on account of the grade of clay. The same conditions existed as below the town with the bank close to the machinery. The top was so "quicky" that it was no good, but still some one was found to take the place of

those who fell by the way. About 1867, or may be a year or so before, a manufacturer by the name of Seaman, who then owned what is now the Excelsior property, bought a piece of land in the rear of the town, on which there was some clay of a stronger nature, which he drew in the fall and winter, and put down six or eight loads to each pit. By so doing he made quite a fair brick. All the others did the same thing, and after a few years they were able to sink and get some of the bottom clay, which was quite strong, so that back bank clay was not used. If the brick which were made in the early sixties were handled as the burnt ones are now when loading on the barrows there would not be whole ones enough left in the load to pay to pick up the broken ones. It is strange that in such a short distance that the quality of the clay should be so different—one strong, with the danger of striking springs, and the other poor and no springs.

#### —Another Section.—

Starting, one may say, from where the poor grade stops, at what is called Peck's Bad Road, and runs for over a mile to Grassy Point. On one side is the Hudson river and on the other the Minneseonga creek. On some parts of it there was top clay, and on others all the clay was below water level. For making common brick no better clay could be found. Starting at a point about half a mile below Grassy Point, at what was called in the past the "narrow passage," as the river and creek were not many feet apart, there was a bank of sand fifty feet high. As it was gradually used in making brick, the clay below it was of a fine quality.

#### —Still a Clay Bank.—

To the west of the creek and continuous for about a mile, and on the highest range in that section, is found the Peck, New York Brick Co., Gardner & Washburn and Fowler and Libburn properties, and fine banks they are. From some of those named clay is drawn over a mile to the yards that use it, strong and good in the majority of the banks. As a mountain stream comes down and flows into the creek, it must, in ages gone by, have deposited rather more sand than it should, as the top bank, when carted any distance, would not stay in the cart, and what did was like mush. The brickyard which used it for many years was a continual graveyard of capital, simply on account of the waste of broken brick. Like the other case named, if the bottom was exposed so that it could be mixed with the top a very fair brick was made. The yard has never been a success, and has been idle three or four years.

The last section of clay property lies just south of Stony Point, just as if it was in a pocket. With no stripping to speak of on top, and about seven or eight feet of clay on top, and that of the best, as the Tompkins grade of brick for many years showed. The yards are now operated by other parties, and turn out a good article.

#### —Grades of Clay—

As is to be seen where one may say it is one continuous bed is strange. It would be expected that it was all formed at once, and would be alike. But no. Some stands up like a tree with regular branches, while in the top of the next it is soft, and, without mixing with a better clay, would be of no use, as many found to their cost.

Sand is as scarce as clay is abundant, and a great deal of the former is brought to the yards by boat from other places, and in the future all the sand that is required will reach that point by shipment, thereby increasing the cost of the manufactured material. The question is very often asked by those who are not acquainted with the clay deposit of Haverstraw if it is not run out. The reply is that there is more clay in sight than ever before, simply because the sinking or taking away the top clay makes a larger face of bank.

A. N. OLDTIMER.

A new cure for snake bite has been discovered, but it is going to be very hard to educate the public to the point of giving up the old remedy.



Written for the CLAY-WORKER.

### BUTTON HOLE TALKS.



I WAS MAKING my way out of the Monongahela House a finger reached out from the thick of the crowd, settled into the button hole, backed me into a doorway and steadied me while its owner pointed to a poor cripple struggling through the crowd and over the street crossing. His shrunk and wasted legs wobbled wearily between crutches, and their every move shot fierce pains all through his system, so that his progress seemed to come, not from muscular exertion, but from painful writhing rather. His lean and shrivelled body hung upon his crutches in angles of pain and misery, while the wasted hands and bony arms fumbled the crutches in helpless effort to help the spindling limbs uphold the shrunk and shattered frame.

From a pallid and wasted face, lined and seamed by pain and agony, there looked out eyes big with suffering. As he crossed the street, so slowly and painfully, even the burly driver of the dray and truck, of the carriage and cab, paused and waited, and, as he writhed on in the crowd, his fevered eye lingered a moment on the hearty, healthy, well nourished forms of the happy, strong, surging crowd, and then he seemed to realize the more fully his own miserable helplessness.

My button-holer pointed to him and said: "He realizes the

enumerate, so many, indeed, that you forget them and do not appreciate them, but that poor suffering devil knows their worth. It's nature all right, the man who can't hear knows the value of music; the man who is blind knows what a glimpse of a landscape is worth. The man with a short neck knows the value of a long swallow, and this poor fellow with the twisted and shrunk legs, knows what a good pair are worth, even though they may be fastened on to feet a few sizes too large." He ran his eye down to my underpinning, looked thoughtful and relapsed into a brown study. GATES.

### AN ILLINOIS BRICK AND TILE PLANT.

IT IS REFRESHING to the trade to learn that others who pioneering the advance in clayworking industry have made a success of the business.

The "Times," Rushville, Ill., in an extended notice of our good friends, John McCabe & Son, says:

There is one of Rushville's solid business industries that is making active preparations for a revival of business, which has been waited for so long, and when it does come McCabe & Son, proprietors of the brick and tile factory, promise not to be caught napping. While there has been but little building in Rushville in the past few years, they have gone steadily ahead improving their brick and tile making plant until now they have increased the capacity far beyond what it was a few years ago, and in addition are making a better grade of brick. The brick are not made from common clay, but instead are made from a good quality of shale. This makes a smoother, harder



John McCabe & Sons' Brick and Tile Works, Rushville, Ill.

blessings they enjoy, but which they do not half prize because they have them all the time. He realizes what muscular strength means, what freedom from pain means, what health means, what ability to do means. They have all that he misses, and yet having it all, but missing some little measure of financial success or of political preference or social excellence they fret and fume and make themselves miserable. He, bound down by pain and impotence, cannot do for himself or others. They toil for their wives and children and glory in their ability to earn for them and to cherish, nurture and protect them, while he, loving none the less, feels himself a burden on his loved ones, all the time longing, oh so eagerly, to do for them all those things that his helplessness prevents him from doing, while he is bound and helpless, physically and mentally torn and harrassed by his aches and pains and a stranger to the glories of sturdy health, of muscular vigor and independence.

"Now, Gates," he continued, "the Almighty has blessed you with health and strength, and a robust appetite and a fair supply of its antedote, and with more things than we can

and more even brick, suitable alike for sidewalks or paving. When broken the bricks show their vitrified character through and through, and it is this characteristic which gives them the necessary hardness for street paving.

Two large kilns, one newly rebuilt this spring, are used for burning the paving brick and tile, and one of the large kilns, which has a capacity of 150,000 bricks, was being emptied last week.

McCabe & Son's tile and brick machine has a daily capacity of 15,000 bricks. Besides they have a Quaker brick machine of 20,000 capacity. They have drying room sufficient for 100,000 brick.

From both mills a high grade brick is turned out, and the vitrified paving brick is especially fine. It is used extensively for sidewalks in Rushville and is rapidly taking the place of board, not only with the city officials, but private individuals as well.

—Tile Business booming.—

Speaking of their business lately John McCabe remarked



that never since he had been in the tile business had there been such a heavy demand for tile. He says the yards have been cleaned of nearly all sizes of tile and even the culls have been hauled away. The draining of low farm land goes steadily on, and McCabe & Son are furnishing the tile. They have started their tile mill going again and will soon have plenty of tile in the yard.

McCabe & Son also manufacture culvert tile, flue lining and copings.

John McCabe, the senior member of the firm, has been engaged in the brick business for fifty years. First as a helper on the yard, then in a few years a proprietor and leading manufacturer of both brick and tile.

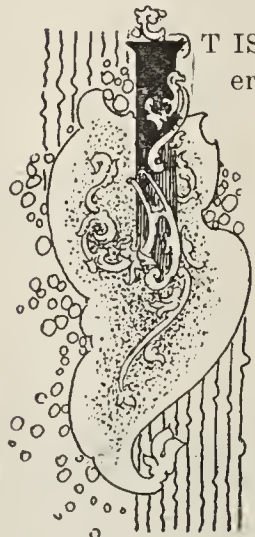
We have had the pleasure of knowing Mr. McCabe for almost twenty years. In that time we have learned to admire his many sterling qualities of manhood as well as his business push.

He was for many years the treasurer of the Illinois Tile Brick and Drainage Association, now known as the Illinois Clay Workers' Association.

Written for the CLAY-WORKER.

### BRICK PAVEMENTS BEST FOR SMALL CITIES.

BY A. W. SMITH, CITY ENGINEER, KOKOMO, IND.



THIS IS VERY SATISFACTORY to our clay-workers and many others to see what rapid strides brick is making as a paving material for small cities, and many streets in larger ones. In saying small cities, I do not mean those of two or three thousand, but those of from ten to thirty thousand as well; and we all know that some of our large cities are using brick with good success.

Why are brick so much used? Simply on account of their merit. True, they are not always satisfactory. Where poor brick are used, bad foundation, or lack of knowledge in construction exists, we would not expect the outcome to be satisfactory; but when material is first-class, foundation solid concrete and the construction is under a competent engineer, I think we will find brick an ideal paving material.

In considering the desirability of a paving material, one of the most important items is the cost—not the first cost alone, but the cost of maintenance as well. A small city has not the wealth to afford granite, neither have they the traffic to require it. Asphalt makes a beautiful street, but does it wear like a good brick? Besides costing more to put down, and the cost of repair far exceeding that of brick.

When I speak of a good brick pavement I do not have in mind one made of second-class brick, laid on sand or crushed stone, but a good brick, such as the Canton, Brazil or their equal. In constructing your street, look well after the drainage. This is as important as the sub-grade. You cannot make a smooth, uniform pavement without a good sub-grade, and this you cannot have unless all soft places, new drains, gas and water mains are looked after in time, and the sub-grade above them made solid by proper rolling. I think concrete is the only foundation to use in any locality. On made grade will you find concrete more satisfactory than any other foundation. The grading is done when the ground is practically dry, and you cannot detect all soft or unsound places. If gravel is used for the foundation, moisture, through capillary attraction, will cause it to go down, leaving a depression in the pavement. When broken stone is used, the sand cushion will in time work down and also leave a depression, but with a good concrete foundation we can have a smooth pavement.

The filler for brick paving is a matter of importance. Our first paving was filled with sand, but I found that with sand as a filler the brick chipped at the edges badly. Then we used cement and find that we have a noisy pavement, although the



City Engineer Smith at his Desk.

brick stand much better, partly because the brick are better and partly because the edges are better protected. I am honestly of the opinion that a good asphalt filler, such as is manufactured by the Assyrian Asphalt Company, will serve the purpose better than either sand or cement, because it will protect the edges, and, I think, overcome the rumbling noise as well. I admitted their asphalt filler in my last specifications, and look for good results.

Not many small cities can afford the more expensive materials, and why should they, when so good a material can be had as our hard vitrified brick? Prof. J. B. Johnson, of Washington University, St. Louis, Mo., says he finds brick to be stronger than granite. He has tested brick as high as 30,000 pounds pressure to the square inch, the strength of granite being 12,000 to 18,000 pounds. In addition to this, the fact that a brick pavement is one of the cheapest as well as one of the easiest repaired, is clean and gives good foothold for horses, taken all round it is a desirable material. I see that among the



A Corner of the Public Square.

business men of Chicago there is much favorable comment on the brick pavement on LaSalle street. It is standing a very severe test.

Just how long it will take to educate the people up to the



fact that streets must be maintained, I do not know. Some seem to have the golden streets of the "New Jerusalem" in mind, and are disappointed when "they find not their like on earth, perfect, and with no need of repair."

Another thing that detracts from the appearance of our brick streets (our own, in a measure, included) is the fact that they are not kept clean. We are too short-sighted not to see that clean streets are as necessary as well made ones. We are delighted to have beautifully paved streets, but it is quite another thing to have them beautifully clean.

One of the best reasons for having good paved streets is that they may be kept clean. There is no estimating how much disease is prevented by having well-paved streets that can be and are swept clean. Who ever heard of sweeping the filth

building a new street, make it a cheap improvement that will soon call for the eternal patching—show me such a place, and I will show you a place that cannot hold its own progressive, public-spirited business men. They are sure to go to a more wide-awake town, and, surely, desirable business men who are seeking a new location will not select a place that is way behind the times.

One of the surest indications of a city's up-to-dateness is good streets, and I am confident that, all things considered, brick is to-day the best paving material for small cities, and, I am inclined to think, for large cities as well, but am unable to speak from personal experience in regard to the latter. Our experience here in Kokomo is very favorable to brick. We put down our first brick pavement in 1895, and it is in first-class



Some Good Three-Year-Old Brick Pavements at Kokomo, Ind.

that accumulates on macadam or other rough streets? That would be impossible, so it is left—horse manure, banana peelings, expectorations of humans afflicted with consumption and all kinds of diseases, with other innumerable and unmentionable filth. All this is left for us to inhale in the dust that is blown about and which might be largely prevented if streets were properly paved and kept clean. So, from a sanitary reason, if no other, we should have well-paved streets. There is nothing that adds so much to the appearance of a place as fine paved streets.

Show me a city where the council or board of public works are indifferent as to what kind of an improvement they have, or are too penurious and short-sighted to put in good, permanent improvements, who are always suggesting that a little patching here or there will do, or, if they finally consent to

condition to-day. It has needed no repairing whatever, and does not seem likely to for a long time to come, as may be seen from the accompanying views, taken especially for the Clay-Worker.

View 1 shows this pavement which was laid with sand filler; the dark spots are droppings, not worn spots, the pavement being free from anything of that sort. View 2 shows the pavement on Main street, at the foot of the hill, near the bridge. The grade here is quite steep, and the street is subject to heavy traffic. The pavement was put down in 1895 with sand filler. View 3 shows another bit of pavement subject to heavy traffic. It is at the intersection of two busy streets, approaching the Lake Erie & Western railroad station, from which a great deal of heavy hauling is done. It was laid in 1896, with a cement filler, and is in first-class condition. View 4 shows



a stretch of the pavement at the intersection of the principal thoroughfares of the city. It was laid in 1896, with cement filler. View 5 is another section of the public square, giving a glimpse of our fine brick court house. This pavement was also laid in 1896, with a cement filler.

As a whole our brick streets are very satisfactory, more so, in my opinion, than would have been any other pavement. Our last pavements, those laid this year, are naturally the best, for the manufacturers are making better brick now than they did earlier. Perhaps still further improvements may be made, and the paving brick of the future prove even still better. Such is the trend of events, for, like other manufacturing industries, the making of paving brick is, or should be, a progressive science.

Written for the CLAY-WORKER.

#### BRICK AND ASPHALT PAVING AT MINNEAPOLIS.



JULY CLAY-WORKER records the use of paving brick in Indianapolis in connection with asphalt the brick being used to pave between the car tracks and the gutters, where experience has proven, asphalt (especially in the gutters) will not stand the action of the water and the stamping of hitched horses. In the same number of the Clay-Worker are some pertinent editorial remarks in regard to the use of paving brick in gutters and other parts of streets where asphalt has proven a failure. We have, here in Minneapolis, an emphatic corroboration of all this. Something over a year ago several blocks on Fourth and Fifth streets, in the central part of the city was paved with asphalt. These streets have but little fall for the water in the gutters, and this and the stamping of hitched horses wore the asphalt in places down to the concrete foundation. To correct this evil the asphalt company has just recently cut out a strip of the asphalt about two feet wide in the gutters

and paved this strip with Galesburg vitrified brick. The spaces between the brick being thoroughly filled with hydraulic cement grout. This, as you justly say in the editorial referred to, is a very emphatic endorsement of vitrified brick as a paving material.

All the new asphalt paving being done here this season will have a gutter border of brick. Twelve courses laid parallel with the curb and thoroughly grouted with cement grouting. In this northern climate in streets having even moderate grade that are paved with asphalt, there is at certain seasons of the year much danger to the horses from slipping on such asphalt paved streets, by reason of sudden freezing after rain, forming an icy surface. To overcome and guard against this danger to horses, and even men, on streets having grade, I think it would be well to have the gutters paved with brick to a width of twelve feet inside of each curb. Where the streets are, say 48 feet wide, this would give 24 feet of asphalt paving in center of the streets and 24 feet of brick paving—12 on each side of the asphalt. This would enable teamsters, when the asphalt is slippery, to drive on the brick paving, and it would also effectively prevent damage by water in the gutters and make it impossible for horses to be hitched on the asphalt. I am not advocating the use of asphalt in place of brick. I believe if brick are best for the exposed parts of streets they are best for all parts of it. But there are uppish people who have a notion that asphalt gives an aristocratic appearance to a street, and on this account they will sacrifice durability and comfort

to appearance. It is true that this wide bordering with brick will subject the brick-paved part to the brunt of the wear and tear to the shielding of the asphalt part. But then, let it be remembered that asphalt paving is a delicate child, born and fostered by aristocratic ideas, and like all things of such parentage it must be indulged or the puny thing will go to a premature grave. Whilst I have the floor, let me make one more suggestion, not from experience or confirmed belief, but simply as a suggestion which would seem to have at least one important advantage, viz., that of reducing the joints to be crossed by vehicles at least one-half, and by which the noise would be diminished by that much, and possibly the wear on the brick might thereby be reduced. I mean, to lay the brick parallel with the curb or line of street, and not at right angles, as has usually been done. In this case the rounding of the corners should be reduced a little. Up to date this year nearly one and a half millions of paving brick have been ordered for paving here. The number would be very largely increased but for the heavy transportation charges in freighting the brick



A Brick Guttered Asphalt Street in Minneapolis.

nearly four hundred miles. This state of things and the many markets in the northwest waiting for a supply of paving brick made nearer home, and consequently at a lower price, furnish a grand chance for some one or more to step in and occupy markets that are not now supplied, and which are free from competition. Suitable shale can be had at a small cost compared with the price that has been paid at many other places.

Minneapolis, Aug. 3, 1898.

J. K. CALDWELL.

A reputation for promptness and dispatch in business is the best advertising a firm can have. Promptness in turning out work, in filling orders, in paying bills, all make any firm stand out in relief. It creates a confidence that can be gained in no other way. Confidence is very largely what all advertising aims to create.—Ex.



## DO PAVING BRICK RECEIVE FAIR TREATMENT FROM THE ENGINEERS.



OBSTACLES WHICH have had to be overcome by paving brick to attain their present popularity have been far greater than any other paving material, and there is still no lack of the smoldering fire from this bitter early opposition. The interested advocates of other pavements were the first to recognize the numerous and great advantages of vitrified brick, as they were in the best position to realize the danger of its rivalry. They were further greatly aided by the popular knowledge of sidewalk brick, which in general has not made a satisfactory record for even this relatively light service, so that it was a very easy matter to create a general deep distrust of an apparently similar material for the very much more severe demands of street paving.

The paving brick manufacturers have had therefore to take



Brick Gutter before Final Coat of Asphalt was put on.

the initiative in educating by tests that vitrified paving brick are not only greatly different from sidewalk brick, but also proving that when well made, they compare very favorably with all other kinds of paving material. They were thus compelled to educate engineers and others by elaborate tests that a new material was being introduced, and that cold facts must be recognized and considered, in spite of the opposition of the advocates of wooden blocks, macadam rings, asphalt combinations and granite contractors. After experience began to endorse the evidence of careful tests as to the durability and reliability of vitrified brick, the engineers were still so permeated with the early prejudices which were fostered against paving brick that the early specifications now seem laughable in their extreme caution in the present light of broadly accumulated data and experience. While these early, careful, elaborate

tests accomplished their object in commanding first the attention, and subsequently the trial, and finally the quite general use of vitrified brick in this country from the city engineers, they have become so interwoven and intimately connected with their use that scarcely any large paving brick contracts are ever let without its accompanying test requirements.

Thanks to the efforts of the committee of the National Brick Manufacturers Association, which carefully and thoroughly studied the testing of paving brick, the tests which are now prescribed are usually much more fair and satisfactory than in the early specifications. When the specifications are thus based on modern experience, they are not only a most efficient safeguard for good work, but are quite as highly valued by brick manufacturers, who desire to see only high grade material used, and who wish to exclude the inferior grades of brick, at least where the traffic is heavy. The careful brick-maker is thus not only a staunch supporter of equitable tests for paving brick, which has been his open sesame in opening the metropolitan markets, but he also advocates their extension to other street paving material. And this is where the question arises as to whether the city engineer gives paving brick fair treatment in exacting rigid specifications and tests of no other paving material. For while it is well known that every clay makes a different quality of vitrified brick, and even great differences may be made in the same clay according to the details of its manufacture, it is not usually known that all other kinds of paving material exhibit equally as great differences.

To the popular mind, wood is wood, granite is granite, macadam is macadam, and asphalt is asphalt, and the cheapest bidder usually given the contract on the assumption that the results will be about the same, no matter who lays the pavement or whence it comes, if the same specifications are followed. This is a very grave mistake, as they will differ quite as much or more in quality than vitrified brick, yet brick have to stand rigid tests while the others do not.

It is quite true that no other kind of paving material can be so easily and satisfactorily tested as paving brick, while we are vastly more ignorant about them from the lack of study and investigation not having been given to them with anything like the care and thoroughness of brick. Furthermore, from longer familiarity with them it is popularly regarded that they can be fairly graded from a rapid, ocular inspection, which too many think is impossible with brick. An experienced, trained inspector can form an excellent opinion as to the quality of any paving material after once being well educated to it, and this applies as well to vitrified brick as any other material.

But many engineers do not think this is possible with brick, and hence tests must be exacted which are not deemed necessary in the case of other paving material. This is where brick-makers should come to the rescue of their benighted brethren, and show them that paving brick can be quite as safely inspected and rapidly passed upon as other paving material, and in addition, can also be rapidly, positively and safely tested by scientific tests that as yet cannot be satisfactorily done with the others. So that instead of these tests being regarded as a stigma on paving brick, and their being put on the questionable list because of the intimate association with test specifications, that on the contrary they are the only paving material which can be both rapidly inspected by the eye and also easily and safely tested by unquestionable scientific methods. Even engineers have often misconstrued the uniqueness of paving brick in thus admitting of rapid, satisfactory testing, and some of them still inherit the old standards that greatly proscribed the field of paving brick.

Whether well defined standards can be established for testing other kinds of paving material that will be cheap, rapid and satisfactory remains to be seen, but until they are brick-



makers should make it clear that all other kinds of paving material are subject to as great or greater variation in quality than paving brick, but that they do not permit of the satisfactory determination of this variation by rapid, cheap, scientific tests like paving brick. The ability to thus satisfactorily grade paving brick by cheap reliable tests, and establish different standards according to the severity of the traffic it is to be subjected to, should be used as a triumphant card by paving brick makers in competing against other paving material. So that while the "guess-factor" still remains a large and indefinite element in the use of macadam, wood, asphalt, and to some extent in granite, this can be eliminated in the case of brick, and the advantages and safety thus secured cannot be too deeply impressed on the municipal engineer. So let brick men educate and push paving brick because it can be based on scientific tests, and above all, that these reliable means of testing is a very flattering and enviable feature in their use. Instead of these tests being regarded by engineers as evidence of unreliability and a reflection on the merits of paving brick, that on the contrary they vary less than other paving materials, and with the tests all brick below the standard can be safely eliminated, which is a feature not possessed by asphalt, wood or macadam.

A PAVER.

Written for the CLAY-WORKER.

#### TWO GOOD PLANTS UNDER ONE NAME.

—H. C. Carroll & Sons.—

**S**EATED BETWEEN TWO huge brick stacks, fanned by a fresh north wind, I looked around with pleasure at the trim lay-out and two plants of the above owners.

This plant occupies a space of about twenty acres at Fifty-eighth street and Girard avenue. The yard is clean, order runs hand in hand with activity, and a good, hearty welcome is always given to a representative of the Clay-Worker by the three sturdy sons of H. C. Carroll, who, I might mention incidentally, is away in Chicago at present.

Seated on my left was Michael J. Carroll, who has sole charge and responsibilities of this yard, and from whom I learned that this yard was first started in 1872, and the first batch of brick found a resting place in our never to be completed twenty-five million dollar City Hall. Since that time,



Michael J. Carroll and one of His Pressing Gangs.

however, thousands of two and three-story houses have covered the truck farms and country lanes which formed the connecting lines between the city and the country, until to-day it is almost possible for them to call over to the bricklayers working on these operations and ask them when they want the next load delivered.

The clay on the ground is of a light, malleable quality, with little or no shale, within easy hauling distance to the rollers, and enough of it in quantity to last for the next twenty years. They have a Chambers engine of 45 horse power and two boilers of 50 horse power, and a Martins improved machine, which they stand and swear by as giving them satisfaction in every

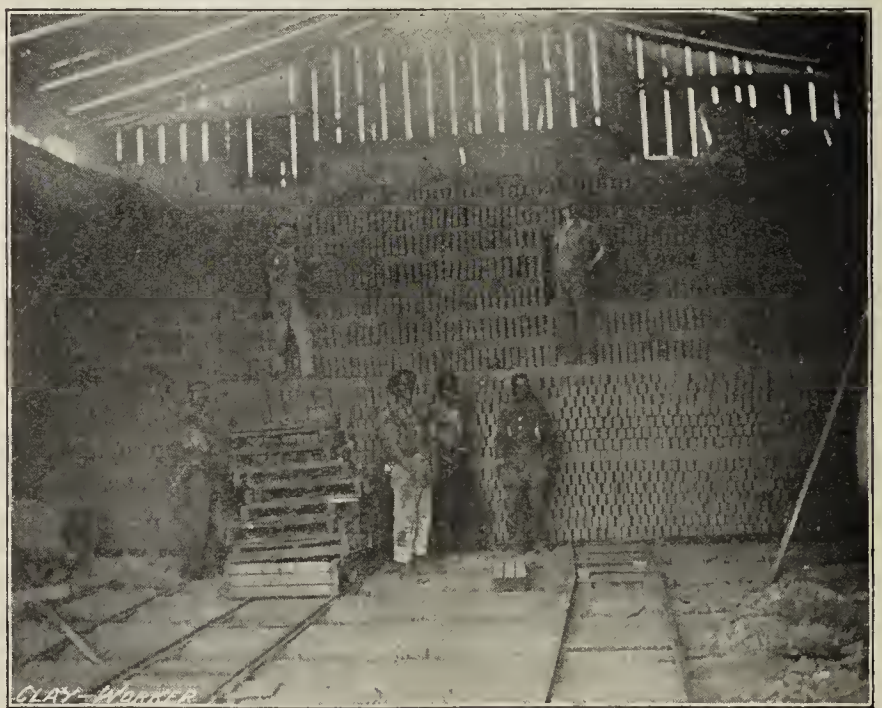


"Getting a Load."

detail. Running north and south is the four-kiln line, with a capacity of 200,000 each, and they reckon to make and set a kiln every five days.

The drying system is divided by the thirty-seven drying racks, with a capacity of 9,700, and nine drying sheds taking up 18,000, in addition to which they have erected a storing shed capable of holding 1,500,000. Last year the fires were started on the 6th of April, and closed down on the 4th of November, turning out in the interim 6,000,000 repressed, pressed, hard, salmon, stretcher and paving brick, but, with it all, closing 5,000,000 short. These, of course, were easily obtained, and books and men balanced accounts satisfactorily.

No need for these same Carrolls to come down town and waste time on architects and contractors while they are supported by these ever-increasing operations of dwelling houses. At Sixtieth and Vine 194 two and three-story houses are being



Setting Green Brick in Kiln.

erected, and for this operation alone Michael Carroll will deliver over 2,000,000 brick. The Shoemaker operation of 104 two and three-story houses call for 1,500,000. Thus it can be easily summed up that when a man can start with nearly half a year's capacity, he is not spending car fare to beg a small order. The pay sheet is always good, prime facia evidence of



what is being done, whether it is in the army, navy or brick yard; and here they run nearly 80 men and boys right through the season. To be exact, 48 men, 10 boys and 15 to 20 carters and teams.

They have the credit of turning out a splendid machine repress brick, clean and silky, that only a blind thoroughbred brickmaker could tell the difference between them and the hand made, assuring me that the latch-string would always be up.

—The Other Plant.—

I turned and followed Peter F. Carroll, who attends to all matters of finance and outside business, and together we made our way over to the plant at Fifty-eighth and Haverford avenue, where I was informally introduced to Eugene H. Carroll. His memory proved to be as strong as his physical make-up. He called to mind my previous visit, along in 1895, when they were located at Sixtieth and Haverford avenue, on the south side.

"Well, sir, you wouldn't know the place. We were forced to move, and since that time they have built up a city. We're nicely fixed. The old engine was on the place when we came, it's a 60 horse power and a boiler of 75 horse power. I put in

PERKIOMEN BRICK PLANT.

EARLY THREE YEARS ago I paid my first visit to this yard, going over the same ground, the same old crazy trestle span, with its ten-inch board in the middle of the track and sufficient space between the ties to allow a two hundred pounder to slip down on the road forty feet below. Weighing a little over a hundred, I have the advantage of a broad foot, and this understanding, taking up the entire width of the board, saved me from being blown over the side.

In my first visit I found the superintendent, William Hagginbotham, in the midst of 100,000 badly-burned brick, and his mouth parched from the warm adjectives bestowed on the British expert who gave them a lesson in expert brickmaking with a continuous kiln. The continuous kiln is still working, and, I am glad to report, with better success, due in a measure to the introduction and use of crude oil in place of all coal. The kiln is first started with the oil and afterwards fed with coal, each of the sixteen chambers being taken in rotation, a chamber holding 22,000 being fired and fed during the twenty-four hours with 130 cans of three-gallon capacity, making a total of 390 gallons, and about two tons of coal or two hundred weight of coal per thousand brick.

The cost, I am assured, is about the same, but the result has



The Oaks-Perkiomen Brick Plant.—Noon Hour.

a Martin's improved and the 20 horse-power Cummer hot air-dryer, and have never had the slightest trouble with them." As we walked over the plant I very soon discerned that Eugene never leaves the latch-string out for trouble. "Clean up" as you go along, never try and do two jobs at one time, and always do one thing well. Such seemed to be his commendable philosophy, and when afterwards I learned he had only changed five hands in two years it was an assurance that his was a pretty good piece of human nature to get along with. He and his men to the number of 44 work every work day in the year, and during the past two years they have stopped but four days, and then only to make some necessary repairs.

With a daily capacity of 38,000 hard, salmon and stretcher he managed to turn out last year 10,500,000. From 18 to 20 loads daily are made, and he averages a kiln every four and a half days. With three operations consisting of 97, 86 and 120 two and three-story dwellings to feed, or a total of 303 houses, exclusive of other work, I may say I left all the Carrolls thoroughly content with the brickmaking business.

been highly satisfactory, since it has raised the quality and quantity over 35 to 40 per cent., thus giving them every week over 40,000 extra and better brick.

It is intended in the near future to add a blower and pipe, and thus do away with the coal entirely. The No. 3 Giant side cut is still working, but the old die has been replaced by a Chambers, and they are now turning out a good bevel edge  $8\frac{1}{2}$  by  $2\frac{3}{4}$  by 4, in place of the old straight hard and sewer.

The yard and its lay-out have been previously described in the columns of the Clay-Worker, and the famous Sercombe Patent Chamber and Continuous Kiln, once regarded as a white elephant, now keeps thirty-two men hustling around. Prospects are good, and, as they have been running continuously since June, 1897, I leave them, promising to call again when Superintendent Hagginbotham is on the ground and I'm that way.

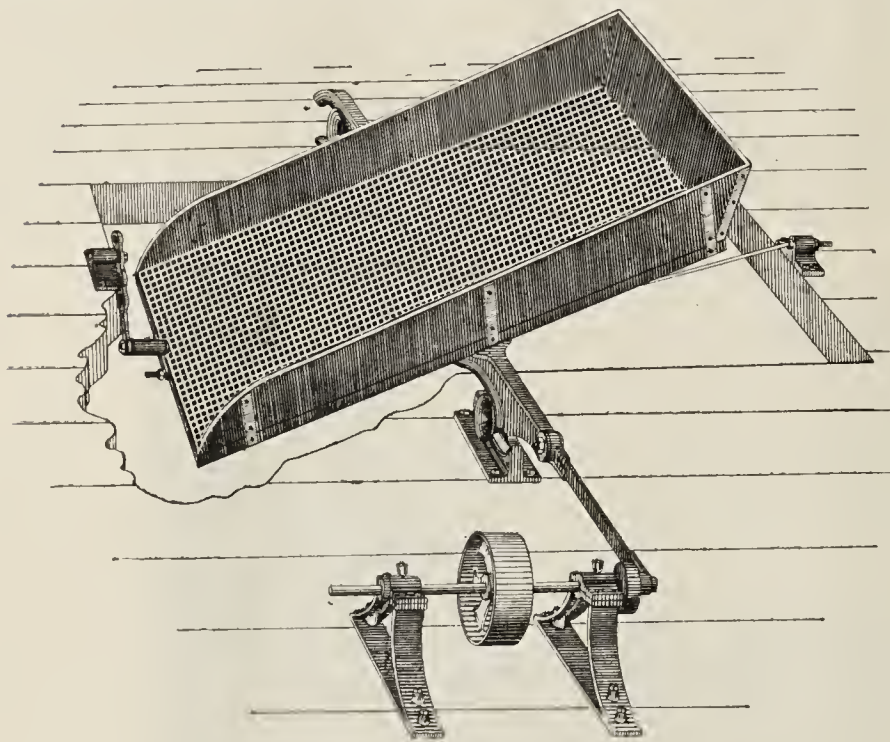
W. P. LOCKINGTON.

Take things as you find them. Do not try to cast the world over into your own mould—not in business. People may be very foolish and whimsical. They should have better taste, of course. But they will do as they please, and if you would deal with them, you must do it in their way.—Exchange.



## A NEW CLAY SCREEN.

THE OHIO CERAMIC ENGINEERING CO., of Cleveland, has recently placed several machines on the market, many features of which are novelties, and have all appearances of being both practical and economical. One of the latest devices they have produced is a screen which they call their "New Model." This screen is worthy of investigation by anyone who anticipates a purchase in that line. It is somewhat lighter in construction than the "Richardson Screen," made by the same company, and is therefore adapted to use in less solidly constructed buildings, especially when placed on an upper floor. It is suspended in the center and thereby shakes evenly from top to bottom with a movement more rapid but less positive in action, and thereby causing less noise and pounding. The angle of suspension can be readily changed and everything taken into consideration it seems to be a very



desirable machine. In designing it the Ohio Ceramic Engineering Co have, we believe, put themselves in a position to supply a demand that has existed in the trade for a considerable time.

## MAKING BRICK WAY DOWN IN MAINE.

THE FINANCIAL affairs of the Columbia Falls Brick Co., of Columbia Falls, Maine, are still in an unsettled condition and work at the plant has been suspended since the 1st of January. A twelve-arch kiln, scoved, daubed and logged has stood unburned upon the kiln ground since December last, owing to a hitch in the finances of the company. The trouble did not arise by reason of the plant being unprofitable or badly arranged, for a finer modern brick manufactory does not exist though there are many larger plants. The trouble seems to be somewhere among the stockholders in regard to the management.

The plant is situated on a narrow arm of the sea, fourteen miles from the coast line at Addison Point. The clay is the finest quality of red brick clay to be found anywhere, and rises sixty feet above the shore. A gap in the great bank makes room for the location of the plant. The main building, which covers the machinery and dry kilns, is a solidly framed white pine structure, built according to the plans and under the supervision of President E. A. King. The clay is carried into the second story in self-dumping cars drawn by a windlass connected with the engine room. The distance from the bank to the hoppers is about forty feet. The cars when dumped gravitate back to the bank down the slight incline. Two number four machines from the Adrian Company receive the clay as it is dumped into the hopper and turns it into brick at the rate of 60 M per day. A bed of the finest molding sand lies near the top of the bank. The dry kilns, a modification of Sharer's when completed according to the plans, will have a capacity of 120,000 per day. The kiln houses lie outside the

machinery building about fifteen feet distant and close to the wharf. The plant is a model one and reflects much credit upon the engineering skill of President King. The brick produced excel any red brick manufactured in New England. In the short time that the plant was run they had acquired a certain reputation for excellence, and government contracts were made to stipulate "Columbia Falls brick, or brick equally as good."

The brick were carried to market by coasting schooners at an average cost of freight of \$2.25 per thousand. The net price at kiln seldom fell below \$6.00. President King hopes to overcome the obstacles soon and set the plant to running. A continuous kiln and a steady output of 100,000 per day all the year round are his hopes for the near future.

—Maine's Clay Coast.—

Brick yard engineers, machine men and manufacturers could make a study of the advantages for brick manufacturing offered by the Maine coast clay banks and be richly rewarded for the effort. We hear much about the rock-bound coast of Maine, but it is a striking fact that there is vastly more clay hills than rock hills from Kittery Navy Yard to Eastport. Great walls of clay rise abruptly from the shore and wall in the numerous "reaches" or arms of the sea which often reach twenty miles into the interior. These reaches throughout nearly their entire length give at high tide a depth of from 15 to 50 feet of water. The clay is generally free from stones, easily worked and burns a bright red color. The best kind of wood can be had for \$4.00 per cord and less, and a fleet of barges would lower the cost of carrying to market much below the present low rates.

First-class plants like that of the Columbia Falls plant for ordinary building brick, and other plants for the manufacture of fancy fronts would pay here, and they could control seaport markets of New England and hold their own in markets farther south.

This is not designed to boom any locality or any concern, but a plain statement of what a practical brickmaker saw on his first journey along the coast of Maine. It may be worth something to some of the Clay-Worker's readers. There is more, much more of it, but space perhaps might forbid.

ZEBEDIAH.

## AROUND THE WORLD.

Recent events have forced into prominence the international importance of the submarine cable. The happenings in one country are the news in another, and where vital interests are involved in the rapid transmission of information, the submarine cable is indispensable. It is now practically world-encircling, with but here and there a missing segment. In the recent message sent by Commodore Dewey to the Navy Department at Washington, the distance traveled from Manila to the Capital was in excess of 14,000 miles, and within thirty-five minutes after the British operator opened his key—the bulletin boards announced the news in the United States. The route of travel was under seas and gulfs and bays, across archipelagoes and continents, and was in touch with related lines that completed the electric web in which the planet is now fairly bagged and every civilized nation in sensitive connection. The number of ocean cables is 1,459 and the total length of cable is 162,928 miles. Seventy-five per cent. of ocean cable interests and systems are in British hands. France has twelve cables in European waters and thirty-three in colonial waters. Germany has the control of eleven cables in European waters and three cables in colonial waters.

A message from Hong Kong to New York makes a devious journey from its starting point to Cochin, China, and thence to Singapore. It then runs around the Malay peninsula to an island on the coast of Siam and then across the Bay of Bengal to Madras, then across the Arabian Sea and under the Red Sea to Alexandria in Egypt. It then speeds to Malta in the Mediterranean and on to Gibraltar and to Land's End, England, via Lisbon, and then by one of eleven Atlantic cables to Nova Scotia, or Newfoundland on the American side of the ocean. By this route twelve cables are utilized and three land telegraph lines—the distance covered, according to the New York Sun, being 14,311 miles. These figures fairly illustrate the world-wide character of the submarine cable, and the important part it plays in the distribution of international news. In a commercial sense it keeps the markets of the world in close touch, and by its means we know the rise or fall of prices, the openings for trade, and can send or fill foreign orders with promptness and accuracy. In fact, the submarine cable is one of the vital arteries in the business body of the nineteenth century.—Age of Steele.



## AFFAIRS AT THE COLUMBUS SCHOOL FOR CLAY-WORKERS.

Ross C. Purdy, Buffalo, the Successful Candidate for the N. B. M. A. Scholarship for the Following Year.

THE CONTEST for the N. B. M. A. scholarship in the Ceramic Department of the Ohio State University, which occurred at Columbus, July 12, as announced in the June Clay-Worker, resulted in the appointment of Mr. Ross C. Purdy, of Buffalo, N. Y., for the ensuing year.

The successful candidate is an exceptionally bright and industrious student, and there is every reason to believe he will prove a worthy successor to Mr. A. V. Bleininger, who has performed the arduous duties involved in the school work during the first year of the scholarship with signal ability and unceasing energy. This will be made apparent to every reader when the official report of the work accomplished is submitted by Professor Orton in a subsequent issue of the Clay-Worker.

The character and scope of the work to be undertaken for the N. B. M. A. during the coming year is now being considered. As soon as the members of the Association have indicated their choice of subjects, the ballot will be canvassed and the result made known. The new school term begins September 14, 1898. Students desiring to enter the course are requested to communicate with Prof. Edward Orton, Jr., O. S. U., Columbus, Ohio, who will cheerfully give all the necessary information as to tuition and other requirements.

The school term which closed in June was one of the most successful in the history of the University. The class in ceramics made marked advancement, and Professor Orton states that the prospects are very bright for that department. He is congratulating himself, among other things, on securing the services of Mr. Raymond M. Hughes as assistant for next term. Mr. Hughes is not only a good chemist, but a man of most pleasing personality, who will exert a helpful influence over the boys with whom he is associated, and will lighten the burden of responsibility upon Professor Orton's shoulders.

Those of our readers who expect their boys to follow in their footsteps and take up the work of converting crude clay into useful forms of whatever character should give careful thought to their education. A course in the School of Ceramics can but prove most helpful to the boy who aspires to be a successful clayworker.

## OBITUARY.

### Wm. Waplington, Philadelphia.

IT IS WITH deep regret that we must chronicle the death of Wm. Waplington, which occurred at his home in Philadelphia August 10th, after a protracted illness. For a decade or more Mr. Waplington has been one of our ablest contributors. Though much of his writings were of a technical character, such as his "Chemistry for Clayworkers," he frequently contributed interesting matter of a lighter vein through our correspondence columns, and we know our readers generally will miss his kindly words of advice and council.

The literary worker, especially one connected with the technical features of an art, often feels keenly its drudgery, for he must repeatedly write of details with which he is familiar and which grows tiresome—an old, old story, but one that must be told again and again, because instructive to the student. Often a writer of this character records his comment from month to month, with no response of approval. Yet in this very silence there is approval, for if a writer makes a mis-statement, he is sure to be promptly brought to book.

Our readers who have followed Mr. Waplington's effort in the interest of clayworkers know that, while taken up as a labor of love, it was nevertheless done seriously and conscientiously. His work was intended to aid and lift up those to whom it appealed. He lived a useful life, and his labor will bear fruit long years after his mortal remains have turned to clay.

He was sixty-three years old, and leaves a widow and several children.

### Death of John McCain.

Another of the older members of the N. B. M. A., has joined the silent majority. John McCain, late of Denver, died at Baltimore, August 9th, in his sixty-seventh year.

Since the war of the rebellion Mr. McCain has been a con-

stant sufferer from a wound in the face caused by a confederate bullet. He has borne his affliction bravely and uncomplainingly to the end. His was a forceful nature. His ready Irish wit and social qualities made him very popular among the members of the N. B. M. A. Of late years he has been unable to attend the annual conventions, but has kept up his membership, and never failed to send a kindly word of greeting and wish the Association God-speed in its good work, to which he contributed to his utmost ability. He was a native of Philadelphia, where he was laid at rest with Masonic honors.

## EDITORIAL BRIEFS.

We are indebted to our able contemporary, the Brick Builder of Boston, for the fine half-tone plate of the terra cotta tablet, pictured on our first reading page.

As will be seen by ad. on page 143, Dallas, Tex., wants a paving brick plant, and affords all the natural facilities of material and market for such an enterprise.

George W. Warren, of Caro, Mich., writes that his health is failing, and consequently he wants a good man who understands setting and burning brick and can manage men. A man of the above requirements and good habits can secure a permanent place by addressing Mr. Warren at once.

Mr. Holl, of the Ohio Ceramic Engineering Co., of Cleveland, has taken a short trip to New York City, in quest of both pleasure and business. If he keeps up his past record he will probably return with a list of wants in the clayworking machinery line that will keep the workmen at his shop out of mischief for some time to come.

Henry Maurer, the well-known brick manufacturer of Maurer, a suburb of Perth Amboy, N. J., recently celebrated his fifty years in America by giving what our New Jersey correspondent calls a fine "blow out" to his employes and friends. Mr. Maurer is a public-spirited man, and recently built a beautiful brick school house, the use of which he donated to Perth Amboy.

On Thursday, August 11, Frank Willoughby Butterworth, the gifted assistant manager of the Marion Brick Co., was wedded to Miss Blanche Ralston, of Marion, Ind. After a brief honeymoon, the happy couple will take up permanent residence at the Hoosier capital. Frank's brickmaking friends, and they are legion, will join most heartily in wishing him and his partner a pleasant voyage on the sea of matrimony.

Milton Edgar, one of New Jersey's best-known clay-workers, has moved from Perth Amboy to South River, N. J., where he will engage in the manufacture of brick. Mr. Edgar's brother Charles is the producer of some of the finest washed clays in the world. His find is in Florida, and most of the potteries in the United States use this clay. Mr. Charles Edgar has been a persistent clay miner and shipper for years, and is deserving of success.

The brickyards at Fishkill, N. Y., and other points along the Hudson are kept very busy these days, owing to the strike at Haverstraw, which has been in force all summer. A few of the yards at the latter place are working, protection being afforded them by a number of deputy sheriffs under the leadership of Sheriff Blauvelt, who is following instructions received from Governor Black to protect the manufacturers and men working on the yards.

## PAVING BRICK PLANT SOLD AT AUCTION FOR \$300,000

The immense works of the Shale Brick and Paving Co., Catskill, N. Y., were sold under judgment of foreclosure August 10th for \$300,000, to H. P. Eells, Trustee, for the first mortgage bondholders. The sale of the works will in no way interfere with their operation. They were operated by the Eastern Paving Brick Co., who hold a lease of the plant, and who will continue the manufacture of paving brick under the same management that has run the plant for the past year or more. The business of the company is prosperous. They are turning out brick to the capacity of the works, and the orders that come in guarantee that there is no let up in the demand for their brick, which is the finest paving material in that section. Their average daily output now exceeds 100,000 pavers. The closing down of this plant would be in the nature of a calamity to Catskill, as it gives employment to a large number of men. Their payroll is said to exceed \$10,000 a month.





THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

### Which is the Best Dryer.

Editor Clay-Worker:

I wish to ask you through your valuable columns which is the better way to dry brick, a hot floor, or rack and pallet under sheds? I am now speaking of soft mud brick, will make 16,000 per day. Oak wood costs \$2.25 per cord, soft wood \$1.50 per cord. I would like this answered by experienced brickmakers from a financial point of view, considering all things. Hoping some of the craft will see fit to give me their views on this subject, I am, very truly,

CHARTER SUBSCRIBER.

### Texas Wants a Paving Brick Plant.

Editor of the Clay-Worker:

As it may be of interest to some of your readers, I write to say that the use of vitrified brick for paving purposes just now forms a lively topic in our city council. It is very probable that the bois d'arc pavements we now have will be superceded by some other material, and it might be well for the friends of vitrified brick to furnish our mayor with full data as to the advantages of that material. By the way, Dallas is fortunate in having an unlimited quantity of clay at her very door, suitable for the making of vitrified brick, as well as various other products, and our Commercial Club would be pleased to furnish prospective investors with the very fullest information touching these deposits. There is not a single vitrified brick factory within this large State, nor, so far as I know, not one in an adjoining State or Territory. Therefore, in view of the vast amount of paving now going on and in contemplation in Texas, it would seem that enterprises of this character could but prove most successful here.

S. A. FISHBURN,

Dallas, Tex.

Secretary Dallas Commercial Club.

### Whitewash and Finger Marks.

Editor Clay-Worker:

Some years ago I took charge of a large plant in southern Iowa for the purpose of reconstruction. They were making by the dry press (two machines) and a large capacity stiff mud machine. I first burned two kilns of dry-pressed brick, buff and red, and the color was all that could be desired. I then burned a kiln of stiff mud brick, and was surprised on opening the kiln to find them most woefully whitewashed all through the kiln, and further embellished by numerous finger marks of another tint. The material was exactly the same in both cases, ground in the same dry pan and screened on the same screens. It did not take much detective work to find that the trouble lay in the water. We were using water from an artesian well over 1,000 feet deep a water, by the way, much prized by the people in the locality on account of its reputed medicinal properties and positively vile smell. It is hardly necessary to say we could not use that water in our boilers, and our supply of good water being decidedly limited, we were obliged to use it on our stiff mud machine, but on a trial for our satisfaction we found, that the good water left no stain on the brick, neither finger marks or whitewash.

On another yard I was making brick chiefly from mined clay, that is, clay taken out of a mine, and directly beneath a vein of coal. Our water in this case was very clean river water, but we had a varying degree of discoloration on both dry-pressed and plastic brick. It was very evident the discoloring element was in either clay or coal, and in fact it was in both, to some extent. We were burning in both down-draft and continuous

kilns, the effect being more pronounced in the latter, owing to the system of 'watersmoking'.

On another yard we experienced the whitewash trouble only when our kilns were not thoroughly watersmoked before raising heat. In point of fact, our kiln capacity was about 20 M per day too low, compelling us to keep them moving all the time or stop some of our machinery, and on several occasions we were setting and drawing from same kiln at the same time.

To sum up: This form of discoloration may be caused by the soluble salts, sulphate of magnesia, alkali, etc., in either water, coal or clay. If the two former, a change might have the desired effect, but if the latter it must be gotten by treatment. Long weathering or slumming will very materially lessen the evil, and, except in bad cases, entirely remove it, at least that has been my experience. In drying or watersmoking, a strong draft must be used, but not too high a temperature, and until the watersmoking is all off the kiln, and a good free circulation established, leave doors wide open. If you are using up-draft kiln, leave your flatting up all over the kiln until all signs of vapor has disappeared, if a down-draft follow same course with the dampers.

Judging from the meager data given, I think your correspondent will find his trouble in the water used, and would recommend him to investigate that first, and if not there, try the other remedies suggested. It is not surprising that finger marks show on the stiff mud brick and not in the soft mud brick, because the latter are very rarely touched with the hand until practically dry, and it is on this point chiefly that I base my opinion, that the trouble lies in the water. Carbonate of barytes is on account of its neutralizing influence recommended as a sure cure, but having never used it, I cannot vouch for its efficiency.

J. W. CARSON.

La Prairie, P. Q. Can.

### Brick vs. Frame Buildings.

Editor Clay-Worker:

As one interested in the progress of brick manufacture, I wish to say my word of approval of the efforts of the National Association of Brickmakers and of those of the Clay-Worker in encouraging the use of brick in the building of houses. Brickmakers themselves are measureably at fault in this matter. See the miserable sheds with which they surround their kilns, and the miserable way in which they protect valuable machinery. In Germany, as you so well pictured, as the result of your correspondence work in that country, it was shown that a brickyard is unknown in that country. Neither were there sheds. They were brick factories, surrounded by splendid brick buildings and brick walls with steel roofs. But this is not what I started out to say. While we all know, as you once said, that the owners of most of the brick yards live in frame houses and frame offices, even our townsman Melcher when here lived in a frame house, and I have no doubt he does now in Indianapolis. Yet all efforts must have a beginning. We must sell more brick to carry on the good work. A few years ago a banker in this community, one well known as a prudent, successful business man, began to build for himself a house. His idea was to build one of wood—a large frame house. But in keeping with his disposition for thoroughness, he put in a stone foundation. The foundation was up, ready for the water table. I am not sure but the water table was on. It looked so solid and substantial that he gave up all idea of building a frame house. He called in his contractor and had new plans made for the upper part of the building, changing it to brick. The finished building cost not less than \$18,000. I get it from the stone cutter and the contractor that the increase in the cost of the building, owing to the change from wood to brick did not exceed 10 per cent. I am certain that this is a valuable illustration that should go to your readers. Understand, for 10 per cent. of the final cost of this building, one certainly worth \$3,000 or \$4,000 more than the frame building is now owned by this banker. Did he ever make a better investment? Did he ever turn his money any quicker? In ten years from now the brick building will be worth at least \$5,000 more than the frame building would have been worth after the same lapse of time. Then there is the saving in painting, and more than all there is the pride in having something substantial the feeling of satisfaction which should come to a man of character in building his home. The way brick are now made, the price at which they are sold, there is no excuse for a man of even moderate means putting up a frame house. What you should have, would be exact facts in this matter. It very seldom happens that an illustration as well suited to your purposes comes to hand as this one. Any business man,



any one who knows a dollar when he sees it, cannot but appreciate the value of this illustration. I would suggest that if more people would investigate as to the exact difference as to the cost between brick and frame that fewer frame houses would be built. It is such a common habit to say that the difference in cost is between 25 and 30 per cent. that it has come to be accepted as a fact; but it is not true. A. B. C.

Marion, Ind., August 9, 1898.

#### To Button Hole or Not to Button Hole.

Gates:—Don't you think you have just gone and done it? If you can't do better with your Button Hole Talks you had better tear the button hole out and grease the frayed edges, so that no more of the green country fellows can hold on to it. You will then be allowed to continue your sums in subtraction without being annoyed by them. Tear out the button hole, Gates, grease the edges and let her flicker. But then the old fellow did tell you some truths, didn't he? Them other fellows don't know their "Marcies," do they? If they did there is not a hole in the United States that would hold them at the general round up. There is nothing but age and deafness that would keep them away. They don't know their "Marcies," Gates, no, they don't know their "Marcies."

Now, Gates, don't you send this to Randall, if you do he will print it sure, for he will print anything you send him. Why, if you would send him,

"The boy stood on the burning deck,  
Whence all but him had fled,"

without quotation marks he would sling it in and swear that it was original and, from Gates.

After second thought I guess you had better continue the Button Hole papers awhile longer. There is a possibility that you may bring those other fellows to realize their "Marcies" and know that salvation is free. Hoping this will find you and yours enjoying all of your "Marcies," I remain,

Yours truly, THE DEAF MEMBER.

Princeton, Ill., August 3, 1898.

#### The Paving Brick Business Good in Western Pennsylvania.

Editor Clay-Worker:

Your inquiry as to trade in this section received, and in reply would state that we are increasing our kiln capacity by building two rectangular kilns of 100 M capacity. We find a good demand for paving bricks, and think we shall experience no difficulty in securing orders for all we can make. The only difficulty at present is that too many paving brick manufacturers are willing to sell at cost, or below, but we hope this condition of things will change for the better.

We have been running our works steady for the past two years, and have succeeded in organizing a new company with \$50,000 capital, under the firm name of the Johnsonburg Vitri-fied Brick Co. Mr. E. D. Emerson, of No. 166 Devonshire St., Boston, Mass., is our president and treasurer, and your humble servant has the management of the manufacturing department, which, you are aware, is the hard end of it.

We are making an excellent paver, as demonstrated by tests made at the Watertown Arsenal and by various engineers, which we think proves that we stand in the front rank with the best of our competitors. I do not believe that 22,960 lbs. per square inch on edge has been obtained by any other manufacturer in the United States; but we have a variety of shales, numbering about thirteen, which enables me to make a mixture of any strength. We also have clays running as high as 27 per cent. iron, containing a large amount of free silica, which gives me a body that I can vitrify them down to a blue color, with so small a shrinkage that it is scarcely noticeable. By mixing these clays together gives me an opportunity of getting the right quantities to make a good paver.

We have forwarded Prof. Orton a number of samples to be tested, and we think you will find they will come up to our expectations. The professor once stated that it was impossible to make a paving brick without lamination, but I think he will be convinced that our bricks are free from lamination, which I consider a very desirable quality in a paver.

I am pleased to hear that friend Gates has recovered from his illness and is able once more to present his "button hole." I think it would be a serious loss to the clay fraternity to lose such a good fellow; and we all ought to join in congratulation that he is once more hale and hearty.

I note by your letter that Bro. Purington is hustling the

paving brick business. This is nothing more than we would expect, as he is one of the pioneers in this line and a hustler from the word go. I think we all owe him a great deal of praise for what he has done for the craft. ALFRED YATES.

#### From Over the Border.

Publishers Clay-Worker:

Please find enclosed draft in payment of advertising as per your account.

I am having very good success, and it may be gratifying to you to know that nearly all of my correspondents mention "the Clay-Worker."

The Laprairie Pressed Brick Co. are enjoying good business at present, finding it necessary to run eleven hours per day to meet demand. They are using a Peerless Updraft, two Eudaly Down Draft and one Continuous Kiln, which was entirely re-built by Mr. J. W. Carson last spring. It is now on its fifth round and fulfilling every expectation. The shipments of the company for the last three weeks of July amounted to 1,478,000, viz., 493,000 539,000, 446,000, comprising dry pressed, plastic, builders and paving brick. They are at present time making some exhaustive tests to determine structural and other conditions relating to the latter, which will be presented at our next convention.

Respectfully, J. W. C.

Laprairie, P. Q., August 5, 1898.

#### "KNOW THAT THE AD. IN THE CLAY-WORKER DOES TOO MUCH GOOD TO LEAVE IT OUT ONCE."



Wellington, O. July 30, 1898.

Messrs. T. A. Randall & Co.,

Indianapolis, Ind.

Gentlemen:-- Yours of the 26th is at hand, asking 'how is trade', etc. Thanks for your interest in the matter. You know we are modest and don't believe in "brag" in business, but as you request it, have no objection to stating the facts, as we are happy at our increase in business, as well as you are at your increased circulation.

Here's the figures. At the end of our fiscal year, July 1st, total amount of sales was 55 per cent more than previous year. Machines sold, 55 as against 39 the year before. 20 of them being "Monarchs", as against 10 the year before. While we are not yet back to the 'good old times' figures, as before the hard times of '93, yet things have improved greatly, and we are building a good large stock to be ready for the boom when the cruel war is over, Mother. Further, our trade this month has astonished us, as July is usually very dull with us, but we have shipped three "Monarchs" to Wickliffe, Ky., Byron, Minn., and Greenock, Pa., and three "Iron Quakers" to Beaver Dam, Ky., Muskegon, Ind. Ter., and Golconda, Ill.

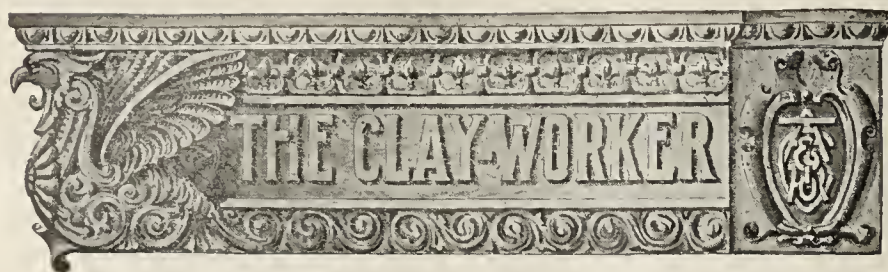
We don't quite understand the last part of your letter: What did you mean? Were you afraid we were going to drop out our ad for a few months, or cut down the amount of space used? Well, we guess not. We know that the ad in the Clay-Worker does us too much good to leave it out once. We trace many of our sales directly to its influence, and in our travels among the brickyards, it is always prominent in the office, and we have often noticed how much the brick manufacturers depend on it for their information, and if anything comes up, they refer to the Clay-Worker, so we will stay with you.

Yours Truly,

THE WELLINGTON MACHINE CO.

*W. D. Dismuth* Secy.





Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

#### TERMS OF SUBSCRIPTION:

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#### ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to  
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXX.

AUGUST, 1898.

No 2.

#### CURRENT COMMENT.

We congratulate Mr. R. C. Purdy upon his winning the scholarship provided by the N. B. M. A. in the School for Clayworkers. The fact that he is commended by Prof. Orton is a guarantee that the interests of our National Association is in good hands, and that a year hence we will have a good report of the work assigned him.

\* \* \*

Brickmakers are usually identified closely with matters of public interest. Most of them are good politicians, so we are not the least surprised to learn that the bright young president of the Illinois Association of Clayworkers, H. F. Townsend, of Avon, Ill., is a candidate on the Republican ticket for Treasurer of Fulton county. We wish him an easy victory. He is certainly well qualified for that important position.

\* \* \*

We again call attention to the hollow block. This number of the Clay-Worker contains another special article on this subject. From the evidence already presented to us, the manufacture of standard hollow blocks of varying forms is certain to enlarge the active field of the clayworker and at the same time add to the resources and income of those engaged in the clay business.

\* \* \*

In this month's article on the Modern American Front Brick, crazing is mentioned in connection with the glazed surfaces. Crazing is really a less serious matter than appears to many. A large proportion of the glazed tile which are sent from our factories is expected to craze, and no guarantee is given or expected that it will not do so. In some of the Chinese porcelains the crazing is used decoratively, and the line of crazing is often controlled. Among other forms which are achieved is what is known as the rice craze. That is, the crazing marks on the surface take the form of grains of rice, and are uniform, exact

and very beautiful. We have not yet learned to use these accidents of manufacture and estimate them at their true worth. It is only recently that rain-marked brick have come to be sought after, and the rain-marks that were once a misfortune are now prized.

\* \* \*

We are requested to advise the clayworkers of Illinois that a movement is on foot to provide for an exhibition of clay products of the great State fair, held at Springfield, September 26th to October 1st. Those interested are requested to communicate with G. C. Stoll, Secretary of the Illinois Clayworkers' Association, Wheaton, Ill. An attractive display of brick, tile, pottery, etc., and the distribution of literature setting forth the economy and advantages of their use to consumers might help on the advent of the clay age.

#### BRICK VS. FRAME DWELLINGS.

On another page will be found a communication in regard to the use of brick in the building of dwellings. We call attention to the fact illustrated by this correspondent that the habit of building frame houses continues long after the reason for building them has passed. Brick has been getting cheaper of late years, while lumber has been getting dearer. There was a time when, in many of our cities, brick could not be obtained at reasonable prices during winter, and when they could there was a suspicion that brick work laid in cold weather was not reliable. Now all this has passed. One can buy brick whenever one wants them at a low price, and there is now really no season when brick cannot be laid properly and permanently. The instance our correspondent mentions is of a very large house planned to be built in wood, which was changed to brick at an expense not exceeding 10 per cent. of the cost of the completed structure.

We commend what our correspondent has said of this structure. It is the very best kind of argument and illustration which should lead people to build in brick. We will be glad to have other readers send us illustrations of the same general character which we may place before the public. It would be wise for brickmakers to have plans prepared and get the exact difference as to the cost of various structures in both brick and wood. They would thus be able to show that after all there is very little difference between a good brick house and one of wood, while, as a matter of fact, the actual value, independent of cost, is much greater in the case of the brick than the wood structure. In this instance there is a great difference between cost and value, the brick structure being much the best investment.

#### BRICK PAVEMENTS.

We realize that the best brick has not always been used in the best way for our brick pavements. Inferior foundations and inferior brick have been used. This, as we see it, is no ground for attack upon brick as a paving material. Good brick well laid is a first-class paving material and poor brick, no matter how laid, is essentially a failure. This is equally true of asphalt, wooden block, macadam or other materials. The main question is that if brick are properly laid as well as properly made is it a successful paver? We affirm that this is an established fact. A dozen or twenty relative failures prove nothing when compared with a few prominent successes. A poor quality of asphalt composition on a poor foundation has always failed. Where first quality asphalt (not counterfeit) has been used on the right foundation it has always been fairly successful. We are inclined to the opinion that there is less excuse for laying poor brick than poor asphalt. One can tell definitely, if he examines a brick pavement carefully, what it will do. It is possible to know in advance



whether a brick pavement will be a success or a failure. It is not possible to know through the examination of asphalt composition whether it will succeed or fail. It is possible to know by the proper examination of brick what may be expected of it within the years which follow its application. Not so with asphalt. We have an asphalt pavement in this city which has been down not more than a year which is now subject to serious and constant repairs. Great sections of it are being cut out and new parts added. What is the excuse here? It is said that it was opened to traffic too soon. Who should have known better than those who applied the pavement when it should have been opened?

### THE WAR OVER.

The war is over. Nothing like it in the history of the world. No other nation ever organized, armed, equipped and fought such an army, with such result, in just 112 days from start to finish, and there is no other nation on earth that could do it to-day. This may smack a bit of boasting, but it is truth as we do verily believe. There remain a few details to settle but, so far as human agencies are concerned, every American feels that these are in safe and wise hands, for never has there been more confidence in those entrusted with the management and execution of affairs. Even the professional carper has held his peace, and the strategist, whose hind sights are always good, has hardly had the cheek to criticise a single movement. But the sublime truth that there is a divinity that shapes destinies never so thoroughly permeated public thought, and hence there is a trust that the remote results of this short war will be highly beneficial to the world, although, from our low plane, we can catch but inklings of what these are to be.

### SOME RESULTS OF THE WAR.

One of the most striking results is largely of a personal nature. Even those who voted against Mr. McKinley accorded to him decided ability as a man, while his most ardent admirers claimed but little for him above many of his equals, but the events of the last six months have demonstrated a strength of character and a breadth of wisdom equal to the emergency, leaving one to wonder how many men there may be among us who need only the occasion to develop latent powers. In many instances his rising to the demands of the hour has been so like Mr. Lincoln's management that enthusiastic admirers have called him a second Lincoln. But what is most to be considered a personal result is the discussions going on in Europe on this very topic. He is a surprise to the European politicians. They had thought it impossible to find among even our best statesmen in civil life one so well equipped for the responsibilities of a great crisis, and they are discussing, as never before, the possibilities of an elective sovereignty. They seem to have for the first time discovered that our President is clothed with power second to no other sovereign on earth; that the sovereignty which primarily rests in the people is, by a process they cannot understand, concentrated, for the time being, in the President, and is ready for use when the occasion demands. They have looked upon Mr. Lincoln's service of sovereignty as exceptional and tolerated only because the war conditions were exceptional, but they begin to conclude that it inheres in the office itself, and they are gravely discussing the question whether an elective sovereignty may not have decided advantages over the hereditary kind. Their admiration of Mr. McKinley's management of the complicated questions involved is unbounded, and is one great result.

### TAKING A NEW STAND.

Two results have followed the developments of the war whose final outcome can be yet but dimly foreseen. They are distinct, but collateral. Six months ago universal America was content to plod along, sowing, reaping, manufacturing, trading, making money and talking politics caring not a fig for the

outside world except as it might be laid under tribute for the main end of life—having had a good, quiet time. They have a vague notion that there was a something called the Monroe doctrine which told the world to keep hands off, and the world construed this to mean, and you, too; assuming that we meant to confine ourselves to ourselves, and mind our own business. But what a change, as results of the war. Aroused by the sentiment that we are, to a large extent, our brother's keeper, we undertook to right the wrongs that are at our doors, but in doing that we have discovered that similar wrongs prevail wherever Spain holds sway, and that even the Philippine islands are our neighbors and demand our attention, and that involves a construction of the Monroe doctrine we have not been accustomed to, and against which the "powers" rigorously protest, since they have discovered that when we got our fighting clothes on we are not to be fooled with. This new opinion of us is one of the most important results of the war, but, distinct from that, yet in some sense connected with it, is the wonderful change of opinion of ourselves, our mission, our possibilities and our relative rank among the nations. Men who six months ago would have gone into spasms at the bare mention of taking a hand in the affairs of other nations are to-day most enthusiastically in favor of holding what we have obtained through the fortune of war, and notifying the world that we are open to new contracts.

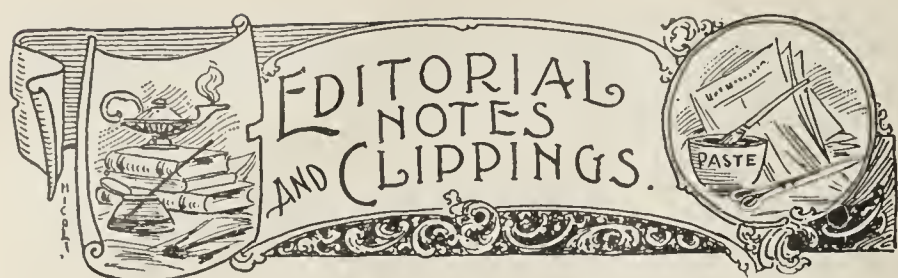
### NOW FOR PEACE AND PLENTY.

Now let us come down to business; let every brickmaker make more brick, and, if possible, better brick, as many may be able to do by giving heed to the many valuable suggestions which appear from time to time in the Clay-Worker. Millions of America's capital are already in transit, or ready to start at a moment's notice, for the new fields the war has opened for American enterprise and energy. Among these will soon be American brickmakers, and we shall not be surprised to have orders for the Clay-Worker from Porto Rico within a month after regular postal facilities are established, to be followed in a short time by similar orders from Cuba, Hawaii and Manila. No one can remotely estimate the commercial and civil achievements which are soon to follow the flag and fleet, not to speak of the social uplift which goes with these. Only a churl or constitutional grumbler can fail to see a bright future for the lands we have redeemed, and a large participation in these results by the people through whose unselfish sacrifice this redemption has been brought about.

### BRICK PAVEMENTS GAINING IN FAVOR.

On a preceding page "A Paver" asks the question: Do paving brick receive fair treatment from engineers? While in a general way we think that the writer answers his own question, there still rests in our minds the idea that hitherto brick pavements have not received all the recognition that they properly deserve. Brick has never had the able pushing advocates who have preceded the movement of asphalt. Again, the maker of brick has not always been particular as to what is done with his brick after they leave the factory. Even the brick themselves have not always been developed to a high standard, and it is only recently that it has been possible, in a definite, practical and theoretical way, to determine the exact character and lasting qualities of brick before they were laid. Now, however, these things are coming to be formulated, and, if brick is pushed hard enough, there will be no question as to their ultimate value as well as the esteem in which they are held by the engineers and the public. When it comes to be recognized that on our best and most heavily traveled streets asphalt is no longer esteemed a suitable material either for gutters or between street-car tracks, and that it is contrary to good practice to use it for alleys, when we find brick used largely for the former purpose and almost exclusively for the latter, as is the case in this city, then we say that brick is making great strides. There is no doubt that brick, in common with asphalt, stone block, granite, wooden block and other material has not always been uniformly successful. On the other hand, the brick has not always had the able advocates standing next to the board of works, the council committees or the city engineers to explain away the cause of failure, oftentimes is due to carelessness in laying.





W. Horn has purchased the tile yard of Thomas Walker at Unionville Center, Ohio.

L. White will make some improvements in his brick and tile plant at Barnes City, Ia.

Henry Krauss, Jr., of Marissa, Ill., contemplates establishing a brickyard at Freeburg, Ill.

The Richardson repress still maintains its reputation as one of the best machines on the market.

Miller & Elliott have purchased a tract of land at Fairfield, Ill., on which they will erect a brick and tile plant.

The Webb tile factory at Warrensburg, Ill., was entirely destroyed by fire recently. The loss is estimated at \$4,000.

The plant of the Sheldon-Edwards Brick Co., Kansas City, Mo., was damaged to the extent of \$200 by fire recently.

Thomas Bemrose sustained a loss of \$100 by the burning of some kiln sheds at his brick plant at Beelon, Ontario, Canada.

Work was recently commenced at Patton Bros.' tile factory at Rankin, Ill. The plant has stood idle for more than two years.

Fire caused a loss of \$400, rently, at the Conococheague Brick Co.'s plant at Williamsport, Md., which is fully covered by insurance.

The demand for brick at Bloomington, Ill., especially paving brick, is so good that the seven yards at that place are all running full time.

Mr. Samuel J. Rose, a brickmaker of Chester, Pa., is prospecting around Winslow Junction, N. J., with a view of establishing a brick plant.

Some improvements are being made at the plant of the Philipsburg (Pa.) Fire Brick Co., which will enable them to greatly increase their output.

A company has been organized at Leslie, Mich., for the purpose of manufacturing brick and tile. George H. Mitchell is at the head of the concern.

Arrangements are being made to manufacture brick on the W. G. Kerckhoff place, at Covina, Cal. The yard will be under the management of Mr. Betto.

V. Kuykenhall and M. Hocker, two young colored men of Morgantown, Ky., have started a brickyard at that place, and are turning out a good grade of brick.

The Parmenter Mfg. Co., of Brookfield, Mass., have made an assignment. The plant is valued at \$200,000, and is one of the most up-to-date brick plants in the State.

The works of the Boston Fireproofing Co. at Revere, Mass., was badly damaged by fire, July 23. The loss is estimated at \$2,500, which is partly covered by insurance.

The Kellough tile factory, near Bloomingburg, Ohio, was burned to the ground, July 28. There was no insurance on the plant, and Mr. Kellough says they will not rebuild.

The Steelton and Harrisburg Brick Co., of Steelton, Pa., were compelled to close down for four days, recently, owing to their clay pits having been flooded during a heavy storm.

The Montello Brick Co., of Reading, Pa., recently booked a 1,700,000 brick order for a silk mill to be built at Phoenixville, Pa., so it is not hard to guess that they are quite busy.

The Moscow (Idaho) Brick and Tile Co. have such a demand for their ware that they have to enlarge their plant. They say they are turning out a very fine quality of building brick.

The new "hand presses" manufactured by the Ohio Ceramic Engineering Co. are marvels, they say, and do first-class work in a manner that would please the most particular manufacturer.

C. E. Davidson and S. H. Harrington will establish a brick plant at Rudyard, Mich. Capt. Harrington, who is a practical brickmaker, will have charge of the plant, so that success is assured.

Nicholls & Matthews, of Wellsburg, W. Va., have the contract for paving several squares in that city. They have put

CONTINUED ON PAGE 134.

## TABLE OF CONTENTS.

|                                 |     |                                 |     |
|---------------------------------|-----|---------------------------------|-----|
| A Fitting Use for Terra Cotta.. | 93  | Editorial Briefs .....          | 119 |
| Hints on Brickmaking.....       | 91  | Paving Brick Plant sold at      |     |
| The Spanish - American War      |     | Auction for \$300,000 .....     | 119 |
| and the German Claywork-        |     |                                 |     |
| ing Industries.....             | 95  | <b>CORRESPONDENCE:</b>          |     |
| Obituary—Albert H. Winslow.     | 95  | Which is the Best Dryer?.....   | 120 |
| English China Clays.....        | 96  | Texas wants a Paving Brick      |     |
| Modern American Front Brick     |     | Plant .....                     | 120 |
| A Brick Factory in a Wooden     |     | Whitewash and Finger Marks.     | 120 |
| Town .....                      | 99  | Brick vs. Frame Buildings ..... | 120 |
| The Development of Hollow       |     | To Button Hole or Not to But-   |     |
| Block Manufacture .....         | 100 | ton Hole.....                   | 121 |
| The Thunder Bird.....           | 103 | The Paving Brick Business       |     |
| Italian Clay Diggers Kick at    |     | Good in Western Pennsylva-      |     |
| Winslow Junction, N. J. ....    | 103 | via.....                        | 121 |
| A Virginia Brick and Tile yard  | 101 | From Over the Border.....       | 121 |
| Efflorescence (Whitewashing)    |     | Know that the Ad. in the Clay-  |     |
| of Brick .....                  | 105 | Worker does too Much Good       |     |
| Anglo-American Pottery.....     | 106 | to Leave it out Once.....       | 121 |
| The Clays and Clay Industries   |     | The New York Market.....        | 138 |
| of Northwestern Indiana ....    | 108 | St. Louis Notes .....           | 138 |
| Brickmaking on the Hudson..     | 110 | Washington News.....            | 140 |
| Button-Hole Talks.....          | 111 |                                 |     |
| An Illinois Brick and Tile      |     | <b>EDITORIAL:</b>               |     |
| Plant .....                     | 111 | Current Comment.....            | 130 |
| Brick Pavements Best for Small  |     | Brick vs. Frame Dwellings ....  | 130 |
| Cities.....                     | 112 | Brick Pavements.....            | 130 |
| Brick and Asphalt Paving at     |     | The War Over .....              | 131 |
| Minneapolis.....                | 114 | Some Results of the War.....    | 131 |
| Do Paving Brick Receive Fair    |     | Taking a New Stand.....         | 131 |
| Treatment from the Engi-        |     | Now for Peace and Plenty .....  | 131 |
| neers.....                      | 115 | Brick Pavements Gaining in      |     |
| Two Good Plants Under one       |     | Favor.....                      | 131 |
| Name.....                       | 116 | Editorial Notes and Clippings . | 132 |
| Perkiomen Brick Plant.....      | 117 |                                 |     |
| A New Clay Screen.....          | 118 | <b>MISCELLANY:</b>              |     |
| Making Brick Way Down in        |     | No Cause for Alarm .....        | 94  |
| Maine .....                     | 118 | Don't Know it All .....         | 102 |
| Affairs at the Columbus School  |     | The Cost of Ammunition .....    | 107 |
| for Clay-Workers .....          | 119 | Around the World.....           | 118 |
| Obituary .....                  | 119 | The Romance of Aluminum ...     | 140 |
|                                 |     | How far Thunder can be Heard    | 140 |

Index to Advertisements on Inside Cover Page.

## Books for...

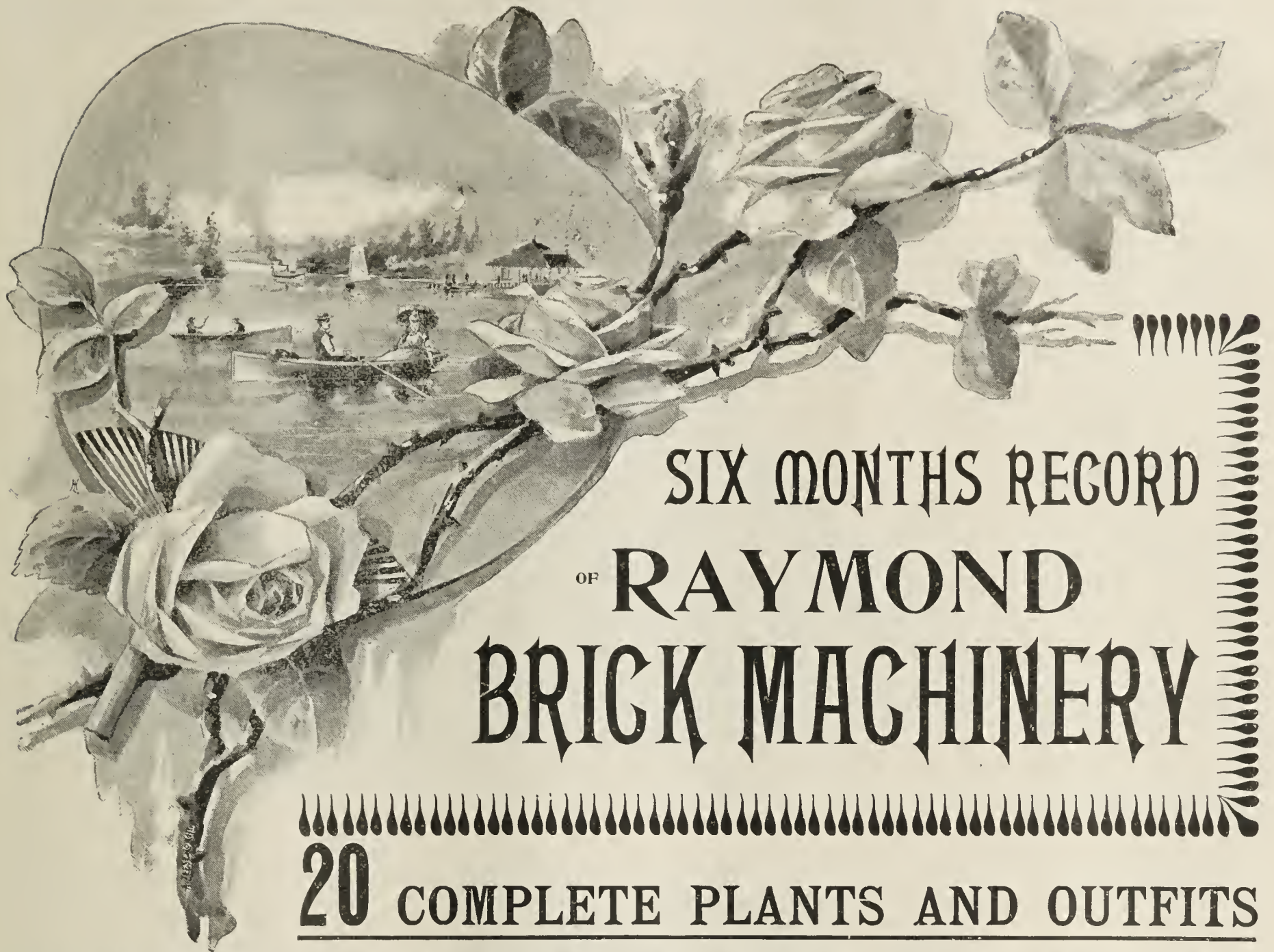
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| J. J. W. Billingsley,         | 1.00    |

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Indianapolis, Ind.





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## 20 COMPLETE PLANTS AND OUTFITS

of this famous machinery sold and placed in successful  
operation during that time.

- Augusta, Ga. Outfit, 50,000 brick per day, with Automatic Cutter.
- Bolivar, Pa. Complete Plant, 50,000 brick per day, with Automatic Cutter and Re-presses.
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- Opelousas, La. Complete Plant, 30,000 brick per day.
- Kingston, Jamaica. Complete Plant, 30,000 brick per day with Re-presses.
- Lewiston, Pa. Outfit, 30,000 brick per day.
- Cumberland, Md. Complete Plant, 40,000 brick per day, with Re-press.
- Vanport, Pa. No. 1. Outfit, 50,000 brick per day, with Re-press and Automatic Cutter.  
No. 2. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Doniphan, Mo. Outfit, 30,000 brick per day.
- Punxsutawney, Pa. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Cassadaga, N. Y. Outfit, 30,000 per day.
- Sieglingville, S. C. Outfit, 25,000 per day.
- Thomas, Alabama. Complete Plant, 50,000 per day, with Re-press and Automatic Cutter.
- Pittsburgh, Pa. No. 1. Outfit, 50,000 per day with Re-presses and Automatic Cutter.  
No. 2. Outfit, 50,000 per day, with Re-press and Automatic Cutter.
- Edenberg, Pa. Complete Plant, 30,000 per day, with Re-press.
- Mexico City, Mexico. No. 1. Outfit, 30,000 per day.  
No. 2. Complete Plant, 50,000 per day, with Automatic Cutter.
- Abbeyville, Ga. Outfit, 25,000 per day.

COULD A BETTER - - -  
TESTIMONIAL BE OFFERED?



**C. W. RAYMOND & CO.,** DAYTON, OHIO.



## EDITORIAL NOTES AND CLIPPINGS.—Continued.

in a Raymond machine and a repress, and are making the paving blocks at their works on Buffalo creek. They sold their dry-press machine to the Mound City Brick Co., of Moundsville, W. Va.

R. M. Matson & Sons, of Falls Creek, Pa., are feeling pretty good these days over an order recently taken which calls for 3,000,000 for the B. R. & P. railroad for a tunnel near Punxsutawney.

The plant of the Dunbar (Pa.) Fire Brick Co. was entirely inundated by a severe rain-storm which struck that section recently. Thousands of brick were destroyed and the loss was quite heavy.

Mr. F. H. Robinson, president of the Ohio Ceramic Engineering Co., of Cleveland, has just returned home from quite a lengthy sojourn in the upper lake region. He reports a very enjoyable trip.

The Adam-Weber Co. has been incorporated at Weber, N. J., by Adam, O. B., C. C. and A. J. Weber and A. Ehrenzeller, with a capital stock of \$150,000. They will manufacture clay retorts, fire brick, etc.

The Cincinnati (Ohio) Roofing Tile and Terre Cotta Co. has been incorporated with \$25,000 capital stock. The incorporators are Jacob Freund, William J. Weitkamp, Elizabeth Freund, Magdalena Meyer and Julia Weitkamp.

M. T. Noll and W. J. Cram have leased the Simon Zollar brick plant at Marietta, Ohio. They will at once begin the manufacture of brick, and expect to run full time. If the business justifies, they may purchase the plant in time.

Philips & Bartlett, of Deadwood, S. D., who have the largest brickyard in the Black Hills, will make extensive improvements in their plant this fall. Among other things they will put in a new brick machine and build some down-draft kilns.

On the morning of July 25 fire was discovered in the dryer of the Milwaukee (Wis.) Brick Co., and in a short time the entire dryer was destroyed. The company place their loss at \$7,000. The fire is supposed to have started from an overheated steam pipe.

The brick plant of Stephen A. Gilmore, Westborough, Mass., was badly damaged by fire on the morning of July 23. The flames started in the kiln sheds, and communicated to adjacent buildings in which tools, etc., were kept, causing a loss of \$2,000.

The employes of the American Encaustic Tile Co., of Zanesville, Ohio, had their annual excursion Saturday, August 6. This year three train loads of them went to Cleveland, Ohio, arriving in the city about noon, and spent the remainder of the day as suited their fancy.

The building of the Raritan Copper Works is now under way at Perth Amboy, N. J., and as it is to be one of the largest of its kind in the United States, it will require immense quantities of brick, No. 1 red building and fire brick, and so help the brick men of that section.

John P. Hudson has bought a tract of land from A. Cummins, near Smyrna, Del., on which a brick plant will be established which will be operated under the management of William Robinson. The business will be conducted under the firm name of Hudson & Robinson.

C. B. Thompson, of Savannah, Tenn., had a kiln containing 100,000 brick ready to burn at his yard at Clifton, Tenn., when the kiln collapsed, resulting in almost an entire loss. The collapse was caused by the heavy and continuous rains that have fallen in that vicinity recently.

The Merrimac Ceramic Mfg. Co. is to be started at Newburyport, Mass., under new management. W. G. Fisher and Thomas Nickerson have combined forces, and will manufacture all kinds of fancy clay articles, such as jardiniers, flower-pots, etc. New machinery will be put in and the work pushed by the new firm.

Thomas B. Prosser, of Philadelphia, Pa., purchased the plant of the Philadelphia Fireproofing and Brick Co. at Clayville, near Vineland, N. J., which was sold at sheriff's sale. Mr. Prosser paid \$45,000 for the plant. Growing out of this sale a new company has been formed to do business under the firm name of the Clayville Mining and Brick Co.

A receiver has been appointed for the Puget Sound Brick, Tile and Terra Cotta Co. at Seattle, Wash., on petition of Jno. Fisher, who claims there is due him \$164.50 for wages. In his petition for the appointment of a receiver Fisher alleges that the defendant corporation is wholly insolvent and utterly un-

able to pay its debts. It has on hand, however, a considerable quantity of merchantable brick, and it is for the purpose of enabling the concern to pay the claims against them that the receiver was asked for.

Henry Wagner, of Yankton, S. D., writes that on account of sickness he desires to sell his brick plant at that place. He says the yard is the only one in a town of 4,000 inhabitants, and is in good condition, equipped with Creager machinery and Hoffman down-draft kilns. He will either sell the yard complete or the machinery separately. Brick sell at Yankton from \$6 to \$7.

The Indiana Brick Co., of Alexandria, Ind., have recently put in two new brick machines, purchased from the Woolley Foundry and Machine Works, of Anderson, Ind. Mr. T. N. Stillwell, president of the company, is very much pleased with the work done by the new machines. Business at this plant is booming, the demand being so great that they can hardly keep up with the orders.

W. B. Henry, proprietor of the Lancaster (Ohio) Brick and Tile Works, has purchased machinery from E. M. Freese & Co. for his new brickyard, which he has established at the State Farm for the purpose of manufacturing brick to be used in the extensive improvements to be made at the State institution. This, in connection with the work at his old plant, is keeping Mr. Henry hustling.

Messrs. Baillett, Gun and Dickson have started an earthenware factory at Tullahoma, Tenn. The firm manufactures jars and other articles. The clay of that section is of excellent quality for the manufacture of earthenware, and this is an industry that will no doubt assume considerable importance in the future. The men engaged in this enterprise are greatly pleased with the result of their work, and the articles they are manufacturing are of the highest grade.

The Horton Mfg. Co., Painesville, Ohio, has just erected a complete plant for D. A. Mullen, Warren, Ohio, for the manufacture of sand-molded brick, consisting of their standard iron machine, with steel pug mill, disintegrator, dump cars, hoisting machine, dump table, mold sander, molds, trucks, barrows, boiler and engine with steam pump. They have just equipped a new yard for the Neff Bros., Kendallville, Ind., using one of their celebrated iron standard machines.

A. J. Haws & Son will make extensive additions to their large brick manufactory at Johnstown, Pa., that will mean an expenditure of \$50,000. Mr. Henry Haws says that it is the purpose to have the new plant in operation within 60 days. It will have a capacity of 500,000 fire brick per month. This will give the old and the new plant an increased annual output of 24,000,000 fire brick. The new works will turn out only high-grade fire brick. It is to be one of the most complete structures in western Pennsylvania.

The main building of the brick works at Farrandsville, Pa., owned by Frederick Munro & Co., was completely destroyed by fire, July 27. The origin of the fire is unknown. The engineer was making preparation for starting the machinery for the night crew, when he noticed one end of the building was in flames, and barely escaped. The few employes at the place formed a bucket brigade, and worked so effectively that they saved the surrounding buildings. The loss is estimated at \$40,000. The firm will rebuild at once.

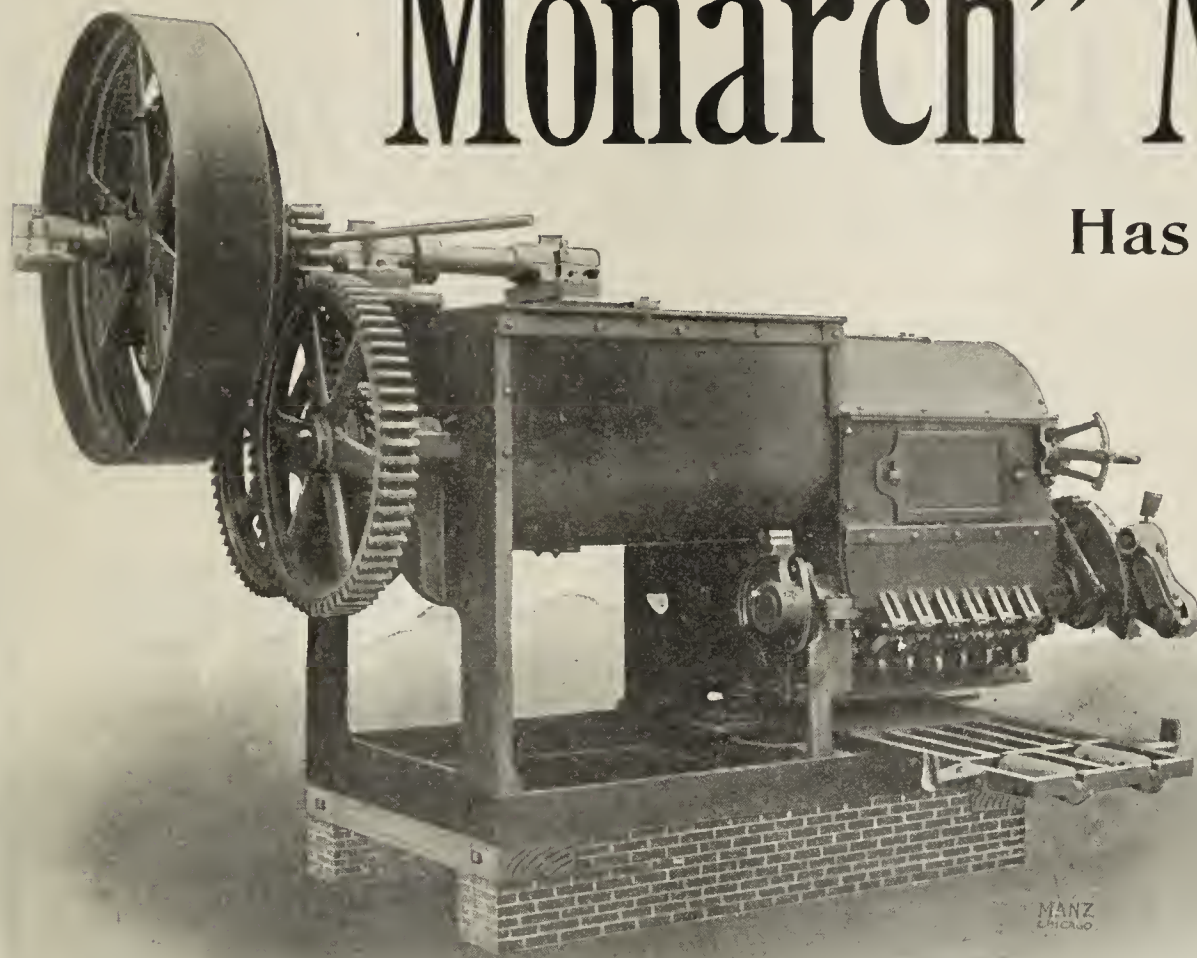
A strike is on at the North Alton Paving and Fire Brick Co.'s plant at Alton, Ill. The men went out August 4. They asked for higher wages, claiming they are working for much less than are the men in the adjacent yards. Their request has been refused, and both the men and the company are determined to stick it out. The strike is an unfortunate one in many respects. The men have now for the first time in two years a prospect for steady employment through a number of months, and the product of the plant is needed to pave a number of streets in Alton, necessitating either the substitution of another brick or the delay of the improvement until spring.

A new industry in South Cumberland, Md., is the Queen City Brick and Tile Co. The ground for the plant was broken in January, and the first brick were turned out in May. These were of such excellent quality that they have no difficulty in securing orders, and have run full-handed from the start, and have orders on hand sufficient to keep them busy for sometime to come. The plant is equipped with Stevenson & Co.'s grinding pan, C. W. Raymond & Co.'s brick machines, and Yale's patent down-draft kilns. Mr. E. C. Henderson, who designed the plant, is superintendent, and sees to it that only first-class brick are turned out. The city of Cumberland is agitating the question of brick pavements, and the Queen City Company can furnish the material when required.



FOUR STYLES OF....

# "Monarch" Machines



Has Double Pug Mills,

Giving the most tempering capacity of any Machine made.

Double Presses

Giving the most pressing capacity of any machine made.

Presses

Are "all in the mud," thereby eliminating all unnecessary friction and wear.



These and other MOST IMPORTANT points which are

IN NO OTHER.

## The "Iron Quaker" Machines

For 1898 are BETTER THAN EVER.

This cut shows the steam power in connection with our Mould Sander.

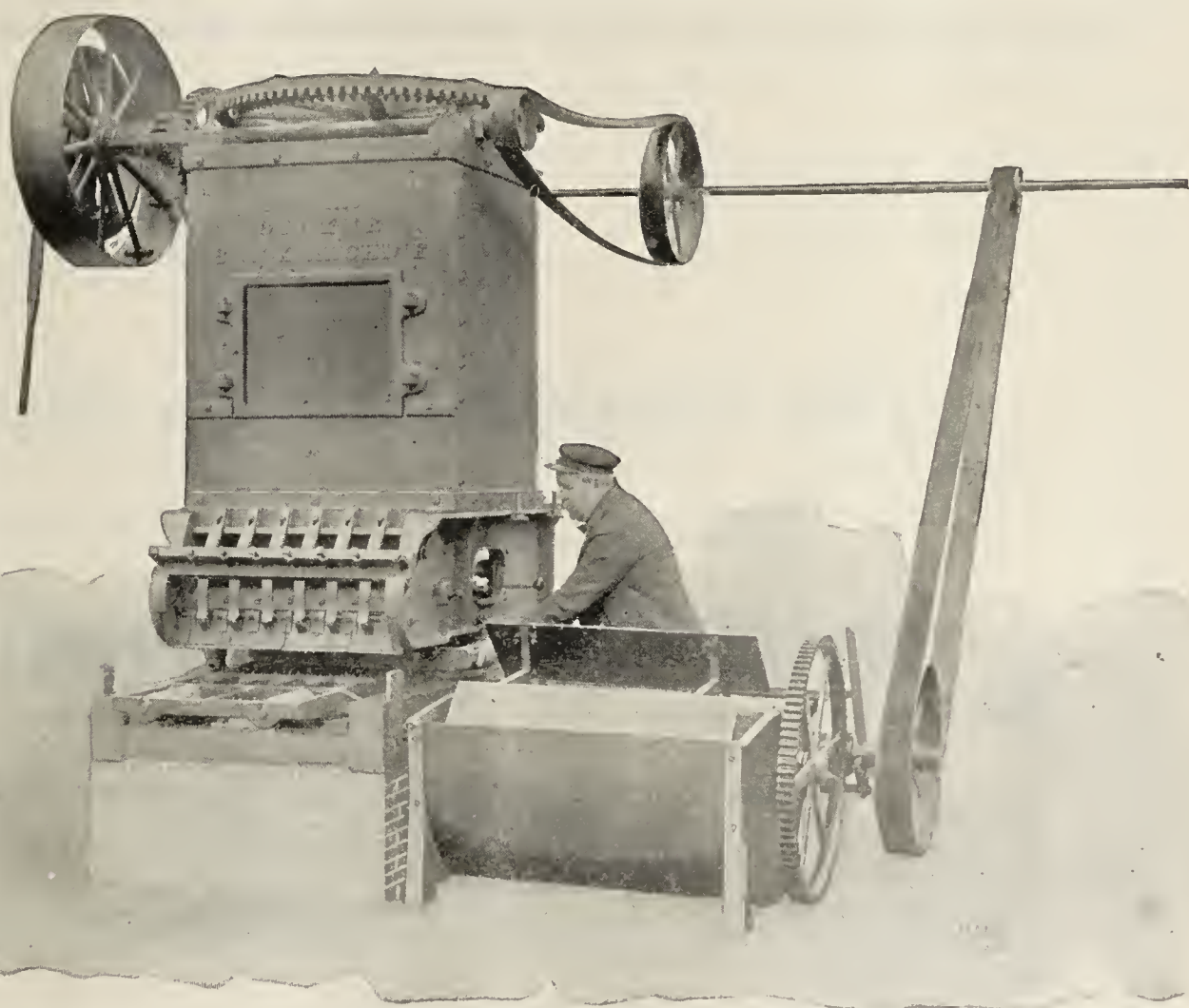
## Our Horse-Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

## Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE: At Bargain Prices.

Odd sizes of moulds. Have not been used.

20 moulds, 8 13-16 x 4 3-16 x 2 7-16. 9-16 in. partitions.  
2 moulds 9x4 1/2 x 2 5/8. 9-16 inch partitions.  
3 hand moulds (3's) standard size.

Second-hand, but used a few days only.

10 moulds, 9 1/2 x 4 9-16 x 2 3/4. 1/2 inch partitions.  
19 moulds, 9 1/2 x 4 5/8 x 2 9-16. 1/2 inch partitions.  
16 moulds 9x4 1/2 x 2 1/2. 9-16 inch partitions.  
19 moulds, 9 x 4 3/8 x 2 1/4.

The Wellington Machine Co.,

WELLINGTON,  
OHIO.

Send  
for  
Circular.



## The Des Moines Brick Manufacturing Co.,

—MANUFACTURERS OF—

# Vitrified Paving Brick,

DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities

Estimates on Brick pavements cheerfully given.

## The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

# Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: **Clinton, Ind.**

## INDIANA PAVING BLOCK,

The Standard Shale Block for  
Street Paving.

Manufactured at Brazil, Ind., by the

**Indiana Bermudez Asphalt Co.,**

Main Office, 25 and 26 Baldwin Block,  
INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.

FACTORY AND SHIPPING DEPOT,  
COALDALE, ALA.  
TELEGRAPH OFFICE,  
WARRIOR, ALA.

W. C. SIBLEY, PRES.  
J. W. SIBLEY, TREAS.

BRANCH OFFICES,  
BIRMINGHAM, ALA.,  
ATLANTA, GA., AND  
NEW ORLEANS, LA.

## The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick, also Fine Pressed and Ornamental Brick.

# Coaldale Vitrified Pavers,

—Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—**actual use**, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.



T. B. McAVOY,  
President.

FRANK B. McAVOY,  
Secretary and Treasurer.

# McAvoy Vitrified Brick Company,

OF Philadelphia, Penn.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee. Correspondence solicited.

OFFICE:  
1345 Arch St., Philadelphia.

WORKS:  
Perklemen Junction, Penn.

# The Purington Paving Brick Co.,

of Galesburg, Illinois,

 AS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business. Correspondence respectfully solicited.



Written for the CLAY-WORKER.

### THE NEW YORK MARKET.

THE BRICKMAKING SEASON is, at present writing, on the last half, or will last until October and probably November, if the weather is any way favorable. Those who have been laying idle since the 15th of June will no doubt want to make it as long as possible, that is, if the strike should end. Some predict that the Haverstraw yards will not mold again this year. Anyone who is conversant with the condition of the men who live there permanently would say that, like the careful skipper, they would "cast" an eye to the windward for next winter. Snow may be scarce, but plenty of wind, both poor material to fill the pot and oven with substantial food.

The early part of the season was a broken one, with wet weather. Then, to be laid aside in June and not able to do anything the rest of the season, would to them be more than four months lost time. Who will care for them when the time for brickmaking is past? Will those representatives of the K. of L., who profess to have the welfare of these men in their "mind" (and nowhere else), put their hands in their pockets and help them financially? As they well know, for at least six months nothing will be done in the yards, and they can safely go to other fields, "if there are any," and the men, poor fools, will have to suffer in silence, as many others in this land have had to do, for following after "strange gods" in the guise of leaders of different labor unions.

So far the loss to the men has been severe, as during the continuance of the tie-up the weather has been comparatively dry, so that nearly full time would have been made. The merchants of the town feel the loss, as they have to trust the men, and in many cases where they have carried the account from last winter it falls heavy.

#### —Sympathetic Strikes—

Have been to the unions in times past the card on which they depended to settle the matter in their favor. Of late in New York City that has had no weight, in the present case sympathetic part is with the brickmakers. Two yards were running, paying the rate asked, as well as the number of brick to be molded. The commission men, as well as buyers in New York City and Brooklyn, refused to handle the stock of those yards. It was totally unexpected and a surprise to the owners of said yards.

The strike has kept the rate near the six dollar mark thus far this season. Over two million per day is the output of the Haverstraw district. This, up to the present, would have made at least seventy millions more brick to go to a market that is well supplied.

#### —The Burning of Small Kilns—

Has been the rule this season, and shipping them as soon as cold, yes, before they are cold in some cases. Just as soon as they could strip the walling off it was done, then put on the outside and wait till next day for the rest to cool. On one yard they started to load one very warm day. The brick were so hot that the man who was tossing out the top gave out by 10 o'clock. The one in the middle stuck to it till noon, but was laid out during the rest of the day. The manufacturer was in a hurry to get his stock in, expecting that the strike would end. The same yard expects to burn next week its fourth kiln this season. Others have no burnt stock, but are burning their third kiln.

Extra boats have been loaded, and, strange as it may seem, some are incited to not ship saying, "Oh, they will be worth just as much this fall or in the spring," not seeming to consider that, the strike ended, the market would tumble so quick it would surprise some. Money in hand is the best policy. A clean shed at this time of the year at \$5.75 per thousand will count, when, later, the fall in price may come, and then they will want extra boats at possibly a dollar per thousand less.

#### —There Are Plenty of Men—

Lots of them, and the best brickyard labor to be had. They are from Haverstraw, but a more drunken lot never worked on the yards. The last pay day on the yards it was a sight on the streets for three days after, with men staggering and laying around under the trees so overcome with liquor that they could not move. It seems that all many of these Irishmen think of is to spend their money for rum.

Not molding, and without rain as the cause, on open yards, something not often seen. The past week the skies have been overcast, with no wind. The yards are full of green brick, and

most of the hacks are doubled, with no signs of clearing. To put brick in the hack and then fill the yard, with no dry brick to set, so that the planks can be cleared, is trying to the man in charge.

#### —How Many Less Brick—

Will be made this season than usual is the ruling theme among brick men at present. Certainly there will be a large falling off. In the first place the wet weather in May made many millions less. By looks of things the strike at Haverstraw may make a shortage of one hundred million. The claim is made that it will reach nearly four hundred million. If so, that is nearly half the number that was made last season. It does not seem possible that it can be any way near that figure, unless Haverstraw does not make another brick this season. If so, brick will be brick before new stock comes on the market.

#### —The Report Is—

That the dealers in New York are taking contracts to deliver at building for a figure below the rates now prevailing. If so, they must have faith that they have a sure thing. The time of year for large consumption of brick is past. Fall work is not as heavy as earlier in the season. It is likely that they expect that Haverstraw will be a shipper, and a large one, as soon as the embargo is off, and no doubt will be, as they will want to get some share of the present rate if they can.

#### —Number of Plans—

Issued in New York City from January 1 to July 1, 1898, 1,747; cost, \$38,293,350. Same length of time in 1897, 2,018; cost, \$50,527,185. A difference in number of 271; in cost, \$12,233,835.

#### —Brooklyn.—

Number of plans for the six months of 1898, 1,790; cost, \$7,037,837. Number of plans for six months of 1897, 1,567; cost \$7,222,140; 223 plans more this year, but cost less.

#### —The Strike Over.—

The strike at Haverstraw, in the opinion of manufacturers, is at an end. The agent of the Knights of Labor has left town. The soup house is closed. The men have asked the bosses to put out 22,000 to the pit, and been refused, and on Monday, August 1, they expect to mold, after six weeks and a half lost time, without any concessions to the men.

#### —Market.—

Haverstraw, —.

Newbery Bay, \$5.37½ and \$5.75.

Up Rivers, \$5.25 and \$5.75.

Hackensack, \$5.50.

Barges over July 21, 15; arrived current week, 45; sold, 45; in market, 15. Look for a drop. A. N. OLDTIMER.

### ST. LOUIS NOTES.

THERE has been a better tone to the financial condition in the last few days, not that there is any perceptible change in the brick market regarding local prices, but the outside demand has been better, which is probably due to a feeling that the war is about over and the end of hard times is in sight.

The appropriation for street improvements has been increased \$40,000. This may not mean much to the vitrified brick industries, as from advertisements recently published asking for bids, the old Telford paving looms up and behind the "loom" is the fine work of brainy men who own stone quarries in St. Louis, and who are close to the city officials. Why can't the brainy men engaged in the manufacture of paving brick settle on a line of action, and by a concerted effort increase the sale of Pavers?

It would seem that the right kind of men employed and paid by the manufacturers of paving brick to watch their interests in every large city would be money well spent. By this it is not meant to employ a man to corrupt legislation, bribe city officials, or do anything dishonorable, but to keep in close touch with the "powers that be," and educate the property owners whose money goes to pay for inferior paving material.

A resolution adopted by the Board of Public Improvement about two years ago stoppped the Telford-Macadam business, but it is up again and is liable to grow unless some active measures are taken by those most interested. It is said that enough macadam has been hauled and spread on a leading thoroughfare (Manchester Road) of this city to make a pile 20 feet high, 36 feet wide and three miles long, and I saw them spreading more of it to-day on the same street.

Business in fire-clay goods is active and the demand increas-

[CONTINUED ON PAGE 140.]

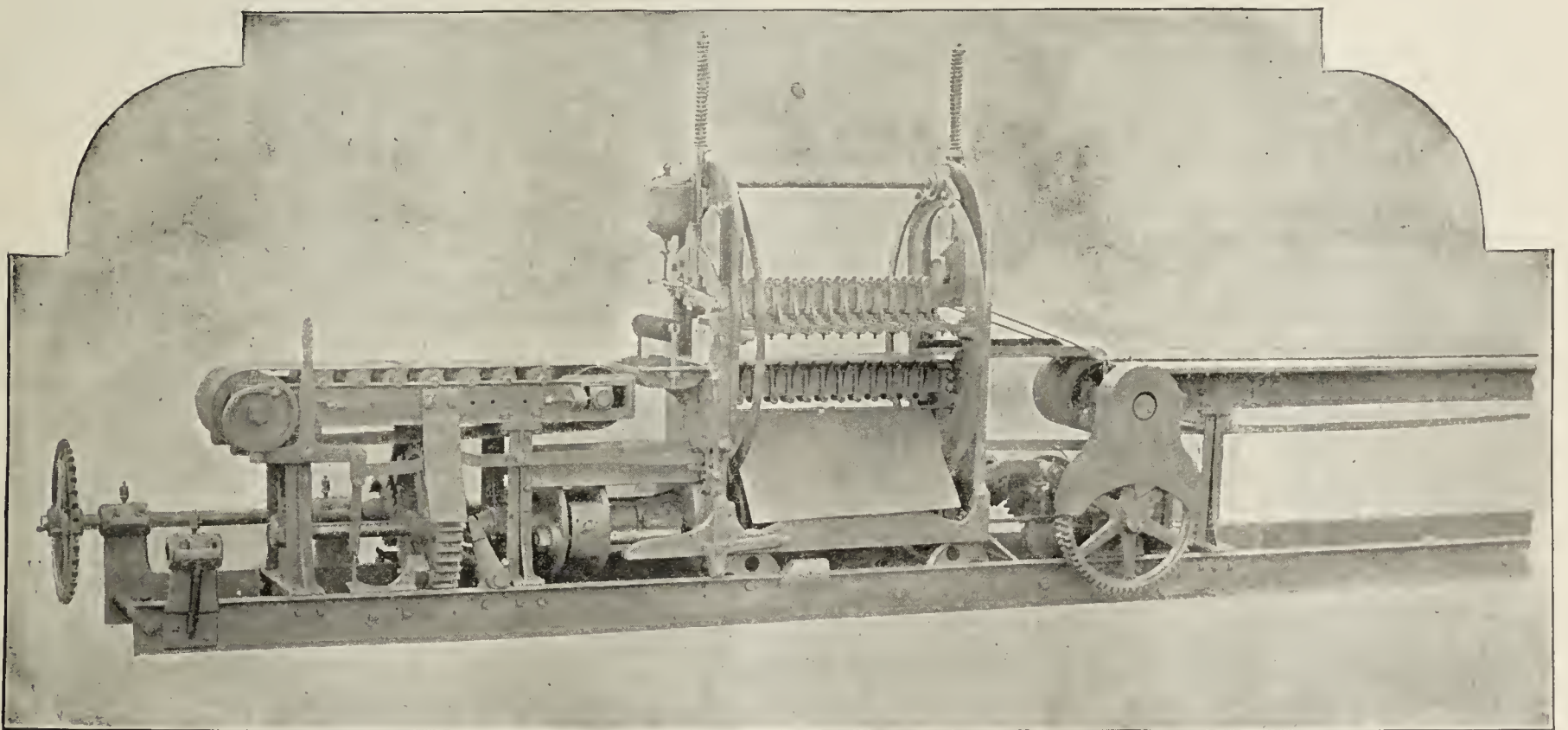


The Ear Marks of Originality are so  
Prominently Displayed in the . . . .



# Cunningham's Improved Combination Automatic End and Side Cut Brick Cutter,

That we Feel Justified in Claiming Priority.



There is a difference of opinion as to whether end or side cut brick is the best. With this Cutter, you can give your customer just what he wants and not what you happen to have.

For particulars regarding this Cutter, and a full line of Brick and Tilemaking Machinery. Address,

## Wallace Manufacturing Co.,

CHICAGO AGENTS:  
Chicago Brick Machinery Co., Chicago, Ill.

FRANKFORT, IND.

See Ad. on Page 83.



## ST. LOUIS NOTES.—Continued.

ing. Sewer pipe trade is fair. Evens & Howard report their terra cotta business growing. Several good contracts have been made, among them orders from Milwaukee, Wis., Des Moines, Iowa, Vicksburg, Miss., and a number of smaller orders from nearer points. In this connection I may note that Mr. R. F. Grady, former superintendent of Evens & Howard Fire Brick Co., has started up the old St. Louis Terra Cotta Co., which makes three concerns now in terra cotta business in St. Louis.

The City Water Department is now using vitrified salt glazed fire plugs and street valve boxes, the idea originating with Mr. L. J. Howard, President of the Evens & Howard Fire Brick Co. A large order was placed with his concern, and thus clay supercedes wood in another direction.

The Hydraulic Press Brick Co. have added three more muffle kilns to their plant for making enameled brick.

The Superior Press Brick Co. have built two large down-draft kilns to enable them to make press brick, which is an addition to their heretofore exclusively common brick trade.

The Union Press Brick Works are building a continuous kiln, which is about completed. It is a combination of combinations, and if it don't work you won't know it—till it does.

The Cote Brilliant Press Brick Co. will go out of business, as the clay is exhausted. An instructive lesson might be learned by following the history of the last named concern, and perhaps it may be given in some subsequent issue of the Clay-Worker.

Our ex-President of the N. B. M. A., Anthony Ittner, is still struggling with his new men, but is running right along. It takes more, a great deal more, than an ordinary strike to stop Mr. Ittner. The labor agitators who instigated the strike on his yard have made him a great deal of trouble, but that they will fail of their purpose is inevitable, for Mr. Ittner's nature and make-up is of that rugged sort that meets difficulties and obstacles with constantly increasing energy which never lags. He follows the Davy Crockett maxim, "Be sure you're right, then go ahead." He always goes ahead.

The American Hydraulic Company will soon be ready to start up. The damage to their machinery and buildings by fire did not exceed their estimate. They have been filling their orders promptly from stock on hand.

The common brick business for July, on the whole, was dull. Taking its total value of building permits for brick structures in St. Louis during July, the average was only \$3,570.00 for each building, and five buildings per day.

## COMPARISON IN VALUE.

|                                     |           |
|-------------------------------------|-----------|
| Permits issued July, 1897, 200..... | \$590,670 |
| Permits issued July, 1898, 145..... | 517,585   |
| Decrease..... 55                    | \$73,085  |

This would not keep the presses of the Hydraulic Company going, and the effect will be felt later on, as old orders are filled.

The Illinois Hydraulic Press Brick Co., at Collinsville, are running with imported men, who are living on the yard. Very few of the old men are at work. A. SAINT.

## WASHINGTON NEWS.

## —Heights of Buildings Restricted in Residence Districts.—

Editor Clay-Worker:

As with most cities at this time of the year, when people flee to the mountains and sea shore, the capital city is a little "off" on business, for, with the exception of a few cool days now and then, the weather gives us a "warm time," in which it is almost too hot to think. But, notwithstanding this, the brick and building industries here are moving on, and the city is steadily growing.

An evidence of the latter fact is seen in a row of brick buildings having rough-faced gray brick fronts, which are being built along New York avenue from North Capitol street to near First street, northeast. These and others, including a new flat in the northwest portion of the city, are material signs that the wheel of industrial progress is still rolling on, and, we believe, will gather momentum as the time of peace between this country and Spain approaches.

It is safe to say that whatever prosperity in the line of brick-making and building may come to Washington, it is not prob-

able that the sky-scraping structure will ever be given much attention here. There has never been much desire on the part of Washingtonians to get near heaven in this manner, and, if there were such, the building regulations would curb this "towering ambition." Recent decisions of the court sustaining the building regulations of the District, limiting, among other requirements, the heights of buildings on residence streets to ninety feet, effectually stops the extreme tendency in this respect. This is, no doubt, a good law, and is in keeping with the policy pursued in a number of the leading cities of the country concerning such structures. The tall building is undoubtedly of much advantage to real estate owners who wish to build their fortunes "up" in this manner, and it is of some advantage to tenants, especially in the matter of obtaining fresh air, but to neighbors who are dominated by the sky-scraper and who have their sunshine and air interfered with by its overshadowing height, it is something not to be desired.

One of the new buildings under construction here is an apartment house, which is being built by the National Capital Brewing Company. Its location is in Georgetown (West Washington) and on the site of an old colonial mansion, which was torn down to make way for its modern successor. Georgetown possesses a great many old houses which were built in the days of George Washington, the bricks for them being brought from England, so it is said.

Money to be borrowed on good security is plentiful here—perhaps more abundant than a number of other large cities. Loans at 5 per cent. are easier gotten than last year, while gilt-edge loans have been recently made at 4½ per cent. and some at 4. So, if one wishes to build houses for speculative purposes on future prospects, or one for personal use, there could hardly be a better time for the purpose than the present.

PARKER.

## THE ROMANCE OF ALUMINUM.

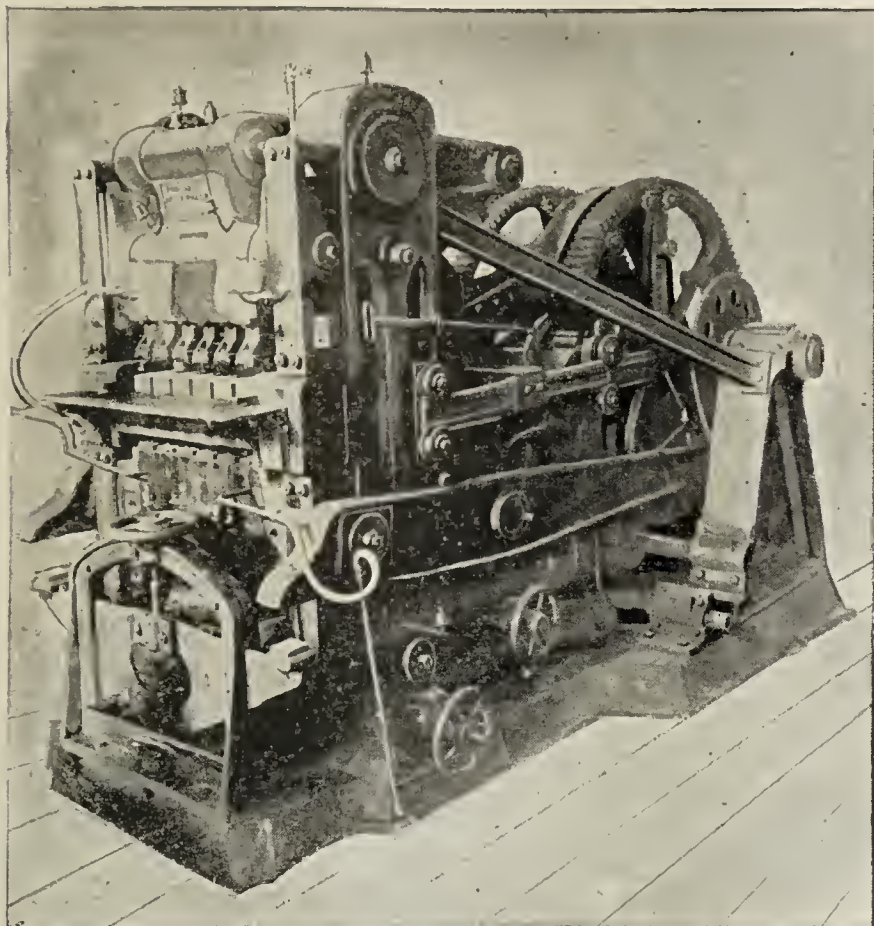
In "Naturae Historiarum" (lib. 36, cap. 26), in which reference is made to an incident in Roman history which, up to the time of Sainte-Claire Deville, had been overlooked by scientists for many centuries, it is related by Pliny (23 A. D. to 79 A. D.) that during the reign of the Emperor Tiberius (41 B. C. to 37 A. D.) a certain worker in metals, (faber) appeared at the palace and showed a beautiful cup composed of a brilliant white metal that shone like silver. When the artificer was presenting it to the Emperor he purposely dropped it on the floor of the chamber. The goblet was so bruised by the fall that it seemed to be irretrievably injured; but the workman took his hammer and in the presence of the court repaired the damage without delay. It was evident that this metal was not silver, though it had almost the same brilliancy, besides being much more ductile and considerably lighter. The Emperor questioned the artificer closely, and learned from him that he had extracted the metal from an argillaceous earth—probably the clay known to modern chemists as alumina. Tiberius then asked if anyone besides himself knew the process, and received the proud reply that the secret was known only to himself and Jupiter. This answer was sufficient. The Emperor had reflected that if it were possible to obtain this metal from so common a substance as clay the value of gold and silver would be greatly reduced, so he determined to avert such a lamentable catastrophe. He caused the workshops of the discoverer to be wholly destroyed, and the luckless artificer was seized and decapitated, so that his secret might perish with him. M. Sainte-Claire Deville had no doubt that this metal was aluminum, and he asserted that the wanton cruelty of Tiberius had deprived the world of this valuable metal, which remained unknown for eighteen centuries. The extracting of aluminum, discovered by the Roman craftsman in the first century of the Christian era, thus became one of the lost arts. —Aluminum and Electrolysis.

## HOW FAR THUNDER CAN BE HEARD.

It is believed that lightning is visible at a distance of 150 miles, but opinions still differ as to how far thunder can be heard. A French astronomer has made observations on the subject, and he declares it impossible for thunder to be heard at a greater distance than ten miles. An English meteorologist has counted up to 130 seconds between the flash and the thunder, which would give a distance of twenty-seven miles.



# The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE  
ON APPLICATION. . . . .

**Progress Press Brick and Machine Co.,**  
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**



## ON TOP!

That's Where We are With Our

.... Up-to-Date Machinery.

**On Top** with our new Berg Dry Press—it's a World-beater.

**On Top** with our Paving Brick Machinery and our Brick and Tile outfits.

**On Top** with our new Automatic Cutter.

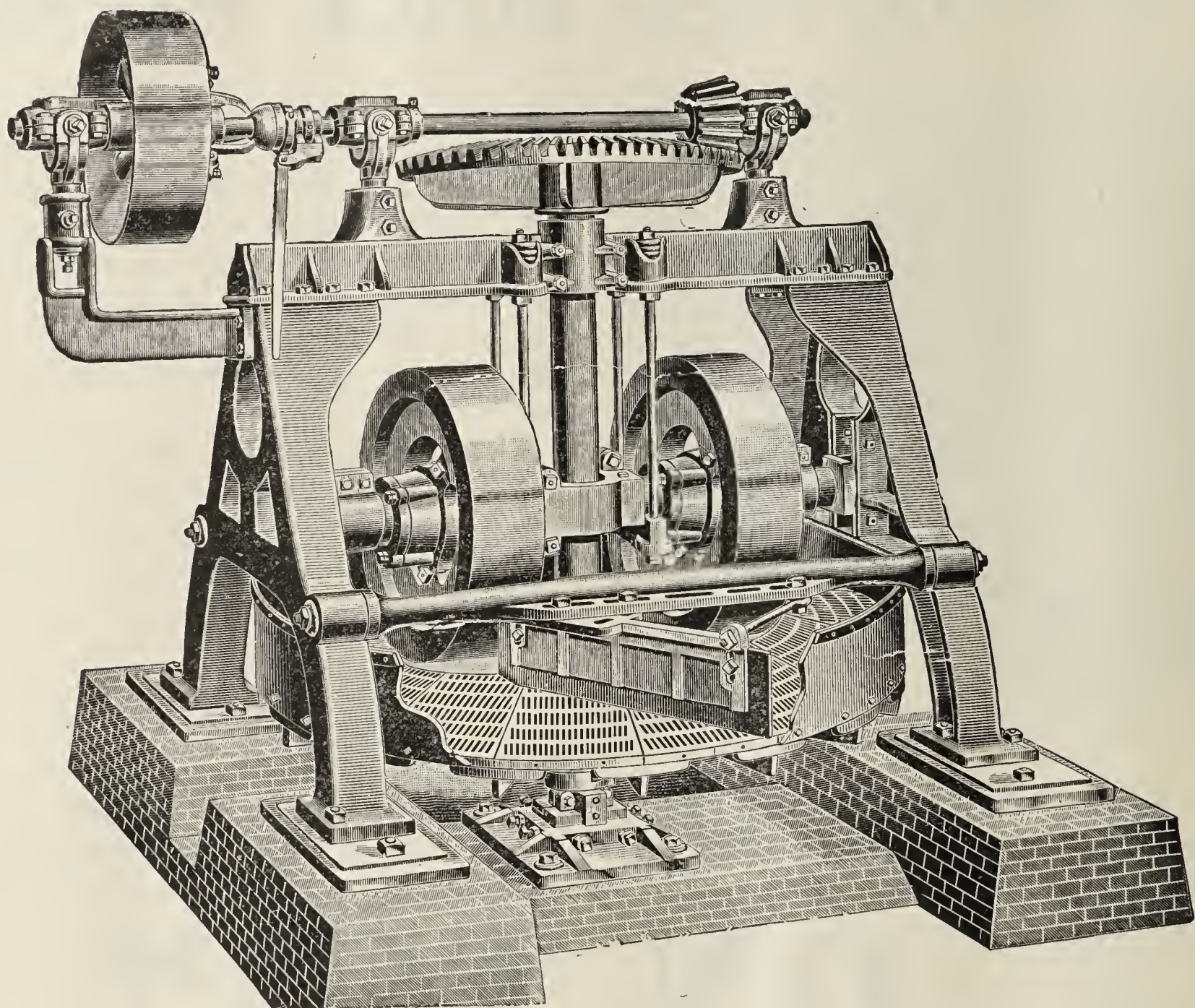
**On Top** with our Soft Mud Machinery.

**ALWAYS ON TOP.**

Send for Circulars. We can put you on Top too!

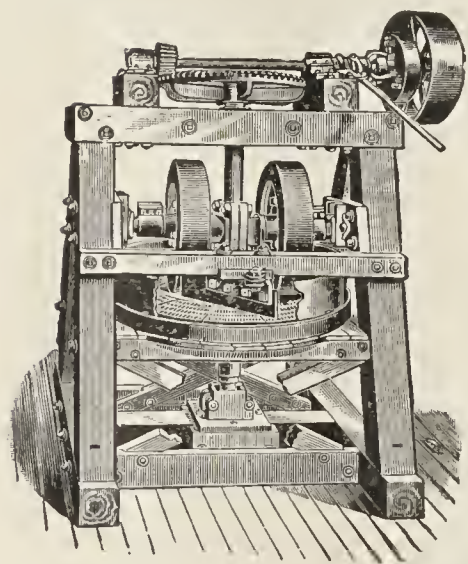
**Chicago Brick Machinery Co., 225 Dearborn St.**





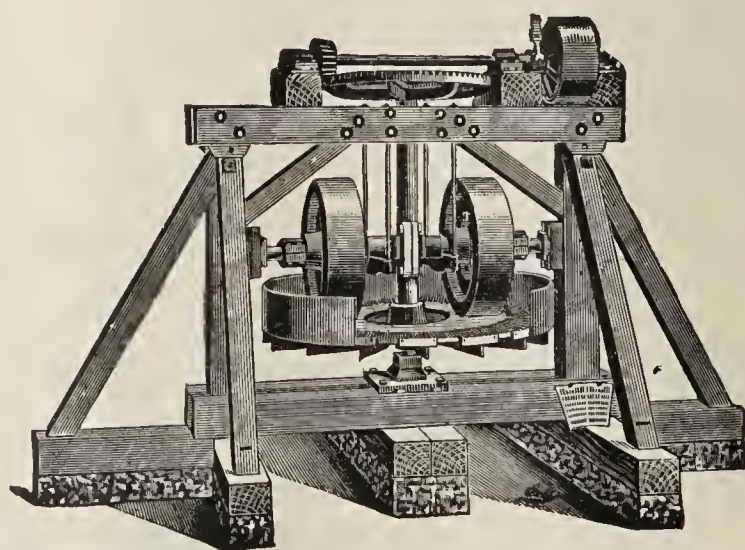
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DRY PANS.



IRON FRAMES,  
WOOD FRAMES.

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All Sizes and Price
to suit
Any Size Plant.
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FROST ENGINE CO., Galesburg, Ill.,  
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I have two Simpson Dry Presses, that are just as good as new, that I will sell for \$1,500 each, F. O. B., Cleveland, Ohio. These presses cost \$3,500 each. FRANK B. MANY, 809 Cuyahoga Bldg., Cleveland, Ohio.



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Antiques, Rare Old Furniture,  
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Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE.—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 114 d JESSE T. MORGAN, Wilkes-Barre, Pa.

FOR SALE—Two second-hand "Martin" Clay crushers. One second hand heavy "B" steam power brick machine, as good as new. The HENRY MARTIN BRICK MACH. MFG. Co., 82 d Lancaster, Pa.

WANTED—Situation as foreman of dry press, stiff mud or paving brick plant. Understands every branch of the business, is reliable and sober. Reference good. Address M. E. C., 81 c care Clay-Worker.

FOR SALE CHEAP—Half interest or more, in fine brick plant at Kansas City; side track, 20 acres pure shale for pavers, 30 ft. breast, no stripping; also 20 acres fine press brick clay. 81 cm LINCOLN, care Clay-Worker.

WANTED — Position by a practical brick and tile superintendent, thoroughly understands the business in all departments; can give the best of references. Address 81 c T. A. L., care Clay-Worker.

VITRIFIED BRICK FACTORY AND  
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Splendid location, superior material and strong preference for home goods. Men of means and experience can get full and authentic information from S. A. FISHBURN, Secretary Commercial Club, 81 cm Dallas, Tex.

PROMPT ATTENTION TO  
ALL CORRESPONDENCE.

UP-TO-DATE MACHINERY  
MEANS IMPROVED MACHINERY,

Machinery that is more economical because it has greater capacity, and cheaper because it is more durable and runs easier, thus requiring less power and fewer repairs than old style machinery.

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Manufacture a full line of Up-to-Date Clayworking Machinery.

Our Specialties: SEWER PIPE PRESSES, DRY and WET PANS, with wrought steel construction frames; also Potters Wheels and Dies for anything that can be made out of clay. Machinery of all kinds.

NO TROUBLE TO QUOTE PRICES.  
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**FOR SALE**—Steam brick plant at Yankton, S. D. Hoffman kiln. Only yard in town and good shipping point; three railroads. Jonathan Creager machine, engine, boiler, pallets, etc. For sale separate if desirable. Address 73c HENRY WAGNER, Yankton, S. D.

**WANTED**—Position as Superintendent or manager, by man of 15 years experience. Have good position but on account of bad health of family would like to change. Address SUPERINTENDENT, care Clay-Worker. 813

**WANTED IMMEDIATELY**—A No. 1 brick and tile setter and burner. A hustler and a good manager with men and good habits. On account of poor health, must have a good foreman immediately. GEORGE W. WARREN, 81 dm Box 457, Caro, Mich.

**WANTED**—A practical man to superintend a small Fire brick plant; he will also be required to represent the company on the road. Reference required. Address, VANDALIA FIRE BRICK CO., 81 d Vandalia, Mo.

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**FOR SALE**—Four large oil tanks, also six wooden storage tanks. Two wooden tanks with adjustable agitators; four iron storage tanks; one Ball pulverizer; one rotary furnace and about 700 tons of ground salt. Address, 81 d M. A. EDGAR, Perth Amboy, N. J.

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**WANTED**—A practical brickmaker who understands making and burning pressed brick, to invest \$5,000 in the business which has now been established for several years, and has a nice output. The present owners are not practical. The party with the above amount of money and who can give good reference regarding ability and habits, can secure a good chance. Address INVESTMENT, 81 d] Room 3, Builders' Ex., Cincinnati, Ohio.

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#### FOR SALE.

One Monarch machine, only used one short season.

One extra heavy Quaker machine in good order.

One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.

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#### ENGINE FOR SALE.

One 22x30 centre crank, Throtting governor, heavy duty engine; the same is new, never having been set up. Will sell cheap for cash. Estimated horse power 250.

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#### FOR SALE OR LEASE.

A well equipped Virginia brick plant, near a large city, affording a good market. The present price of common brick is \$7 a thousand, Pavers \$9 to \$10. Abundance of excellent clay and cheap fuel. A splendid opportunity for a practical, industrious man. For full particulars. Address "WIDOW," 7 tf l care Clay-Worker.

#### BRICK MACHINERY FOR SALE.

One Patent Phillips Dryer with Westinghouse engine, complete.

One No. 12 Penfield Pug Mill.

One No. 28 Disintegrator.

Large quantity of plain steel pallets and perforated cast iron pallets. Address BILTMORE ESTATE, 1 dm Biltmore, N. C.

## No Dry Press Brick Plant Complete

..... WITHOUT .....

## The Carmichael CLAY STEAMER.

T. W. CARMICHAEL, Manufacturer, Wellsburg, W. Va.

## St. Louis Terra Cotta Co.,

....MANUFACTURERS OF....

## Architectural and Ornamental Terra Cotta.

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In Stock: Diaper Tile of all sizes, Caps, Coving, String and Belt Courses, Panels, Skewbacks, Etc.

ESTIMATES FURNISHED ON APPLICATION.

## The Best Brick Drier



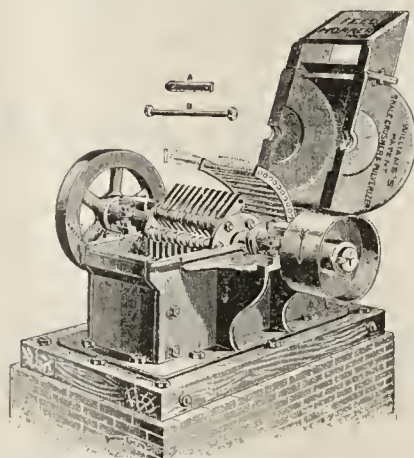
Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

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A Clay Pulverizer of Wonderful Capacity:

Our Pulverizer is Fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



These machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known. Will guarantee them under any and all circumstances.

The WILLIAMS PATENT  
CRUSHER & PULVERIZER CO.,

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# G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

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## FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

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MANUFACTURERS OF

**J. N. K. Brick Machines and  
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Pug Mills and Clay Crushers.**

With our improved machines a superior quality of building brick can be made with less outlay of labor and capital than by any other method. The J. N. K. Machine makes a fine front brick as cheaply as other machines make common brick. Full particulars for the asking.

**J. N. KAUFHOLZ,** Proprietor and Patentee,  
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IF YOU NEED.. **Wooden Pallets,**  
WE CAN FURNISH YOU THE BEST

We make all Styles of

Rack Pallets,  
Hacking Pallets,  
Pallets for Dryers,  
Also Decks for Dry Cars.

We can ship them anywhere.

Get good Pallets from those who know how to make them. It will pay you in the long run. . . . . Send for circulars and prices.

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MENTION THE CLAY-WORKER,  
WHEN WRITING TO ADVERTISERS,  
MENTION THE CLAY-WORKER.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.  
T. W. CARMICHAEL,  
Inventor and Manufacturer,  
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6 tf d

FOR SALE—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN, Room 13 Palmer House, Chicago, Ill.

3 t f d

FOR SALE — One Barnhart style A, 1½ yard steam shovel, with a one yard dipper, slightly used. First class condition.  
HAYT & ALSIP CO.,  
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WANTED — Situation as Superintendent or Foreman of brick works. Practical in every detail. No. 1 burner, up or down-draft kilns, dry or stiff clay process. Address SUCCESS, 6 tf 125 P. Care of Clay-Worker.

FOR SALE CHEAP. — One Second-hand, double die Columbian Repress; practically as good as new.  
One Quaker Horse-power Brick Machine, in good order.  
One Monarch Brick Machine, only used one short season. All in running order.  
THE HORTON MFG. CO.,  
Painesville, Ohio.

1 tf L.

FOR SALE — Entire lot of machinery for manufacturing brick and tile. One one hundred H. P. engine; one dry pan, capacity 50 tons; one wet or mixing pan, capacity 50 tons; one steam press (Bruner make), capacity 10,000, with dies from 3½ to 18 inches; one E. M. Freese & Co. brick table; one Dean Bros. force pump; one 40 H. P. boiler and a lot of shafting and pulleys; 60 rods of tramway and four dump cars. All in good order. Address, W. G. WILSON, assignee of Barber Bros. 6 3 cm. Lostant, Ills.

FOR SALE — Fire clay property and factory site; 2,500 acres within six miles of Baltimore, Md., a large part underlaid with clays of fine quality and great variety, suitable for making red, buff and other kinds of brick, tiles and terra cotta. Railroad through property connects it with Baltimore and Washington. Water connection with Baltimore and Chesapeake Bay by channel 15 feet deep. Good water power on property. Fine site for factories. Parts of property are suited for suburban development and parts for truck farming. For sale as a whole or in lots to suit, on reasonable terms. Also a small factory equipped for making roofing tiles and brick. Address CURTIS CREEK M. F. & M. CO., 12 St. Paul St., Baltimore, Md.

5 6 cm

FOR SALE CHEAP.

One second-hand, double die Columbian Repress; practically as good as new.  
One Quaker Horse-power Brick Machine, in good order.  
One Ten Horse Power Portable Engine, in good order. THE HORTON MFG. CO.,  
Painesville, O.

1 tf l

FOR SALE.

Two 8-foot dry grinding pans, under gear pan.  
One 8-foot, under geared, iron frame wet for wood work.  
One new 5-foot wet pan for wood frame.  
One Potts stock brick machine.  
One Potts sanding machine.  
One 7-foot horizontal pug mill.  
Two vertical pug mills.  
Large lot of steel and iron pallets.  
Twenty pallet cars.  
One 30 H.-P. horizontal tubular boiler.  
Lot of boilers, tanks, etc.  
THOMAS CARLIN'S SONS.  
Allegheny, Pa.

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FOR SALE AT HALF COST.

One quite new, four mould dry press brick machine, made by Boyd. One four mould dry press brick machine made by Fulton Iron Works, styled the Eureka. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator. One Straight Line Engine, 14 x 14 cylinder, excellent order. Five second-hand horizontal boilers, about 15 ft. lengths, 6 ft. diameters, 3-inch tubes, 50 to 60 h. p. Eight fans, 7 ft. in diameter.

7 3 dm

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## FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.  
6 spring brick trucks.  
Lot shafting, belting and pulleys.  
1 Barr Pumping Company steam pump.  
All new or little used, and in excellent condition.  
WALNUT,  
Care Clay-Worker.

ENGLISH PLANS FOR PLASTIC  
BRICK WORKS.

Complete sets including general plan and elevation of works.

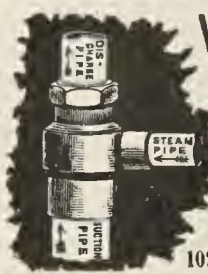
Plans and sections of machine room.

Plans for Dryer heated with waste gas from boiler.

Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.

Prices on application to

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**VANDUZEN STEAM JET PUMP**  
THE BEST IN THE WORLD.  
Pumps Any Kind of Liquid.  
Always in Order, never Clogs nor freezes. Every Pump Guaranteed.  
**10 SIZES.**  
200 to 12000 Gallons per Hour.  
Cost \$7 to \$75 each. Address  
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The Henry Martin  
Brick Machine Mfg. Co.,  
Lancaster, Pa.

Machine  
Brick Moulds  
a Specialty.

## PRICES:

Steel bound machine moulds,  
5 or 6 brick ..... \$1.75 each

With Steel Lined Heads,  
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With Panel Bottoms, solid, 5 cents per brick extra.

With name plates 5 cents per brick extra.

Top irons dovetailed, or crimped if preferred.  
Handles any desired pattern.

Prompt attention to all orders guaranteed.

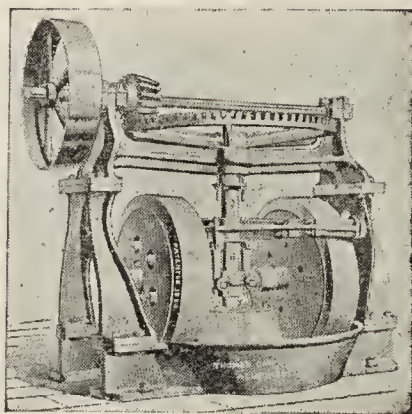
# BRICK CARS and TRUCKS

Of Any and All Kinds.  
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

**THE ATLAS BOLT & SCREW CO.,**  
Cleveland, Ohio.

## CARLIN'S DRY PANS are



Stationary Wet Pans.

THE BEST and in the long run the cheapest Dry Pans on the market. They are the cheapest because they are the best. Carlin's Dry Pans are built for service and capacity. Ask those who are using Carlin's Dry Pans and they will tell you they are the best and cheapest pans made. We make several different sizes. If you are going to buy a Dry or Wet Pan and want the best value for your money don't fail to get our prices.

We also sell Engines, boilers, Pallet cars, Revolving derricks, Conveyors, Hoisting machinery, etc. Send for prices and terms.

Thomas Carlin's Sons,  
ALLEGHENY, PA.

Mey Detachable Chain Belt.



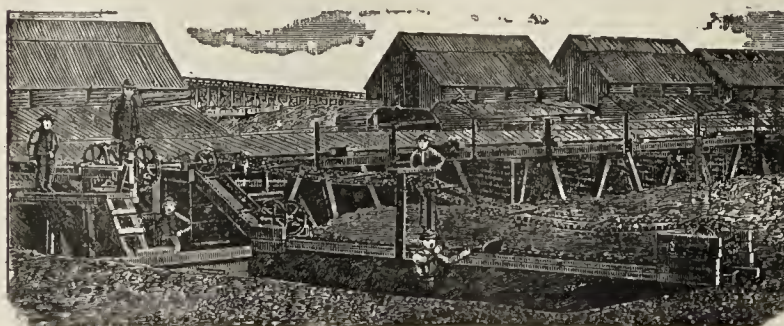
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F. H. C. MEY,  
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Approved Appliances for  
Elevating, Conveying and Transmission of Power,  
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THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.



Make  
Many More  
Thousands

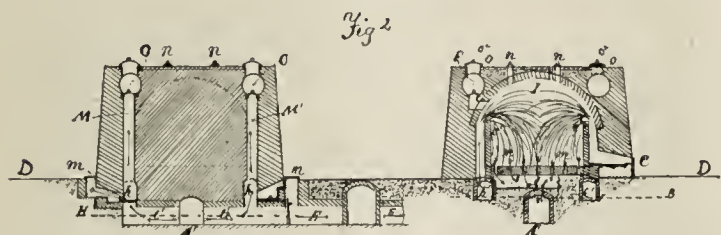
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

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# The Down Draft Continuous Kiln.



burn clay ware. The automatic draft regulator assures an even draft at all times in every compartment in operation. The cooling of the clayware is fully controllable in the hand of the burner at will. The draft of the advance heat and combustion through the floor is connected from compartment to compartment until the heat is taken up by the wares before leaving the stack. The heat from the cooling compartments is drawn to the compartments for steam drying the green wares. For small yards it is not necessary to construct the full kiln, only build compartments as is necessary for the output and if the demand requires more kiln room, extend any time later. I guarantee that my Kiln will burn as clear color, sound enameled clay ware as any other down-draft kiln in use. Parties intending to improve their product and profit should not fail to correspond with me in regard to cost of construction and license right, which I will give for a reasonable living price. In corresponding, state the kind of material manufactured, also daily capacity, to the Inventor and Patentee.

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# NEW DISCOVERY KILN

Patented April 13, 1886, June  
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**More than 1,000 in use in  
United States, Canada  
and France.**

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

**Reward For information of infringements.**

To know more and what users say of it,  
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### Grain Sizes and Ground.

Samples, Prices and Booklets on Request.

**KENDALL & FLICK,**  
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Being actual producers of the raw material and having especially built machinery for its preparation we are in exceptionally good shape to supply you with reliable stock of the best and most careful manufacture.

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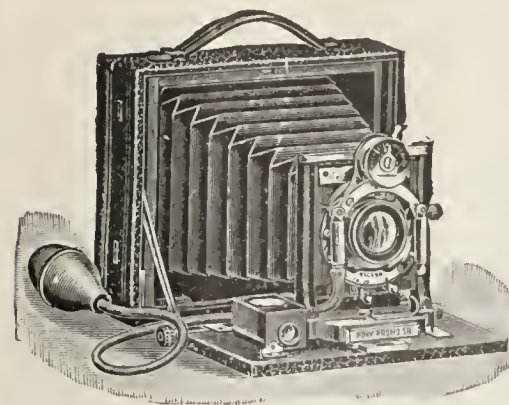
**Sole Importers in the United States of the**

Precipitated  Carbonate  
of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

### Circulars and Particulars on Application.

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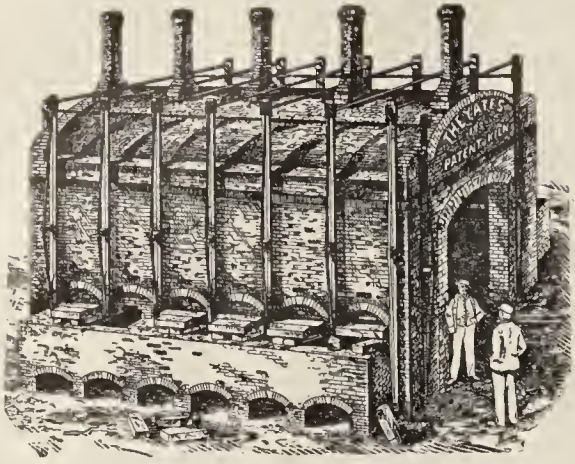
From  
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Upwards.

The sum of fifteen years' experience, the brightest skill and perfect workmanship. More improvements than any other camera.

CATALOGUE MAILED FREE.

ROCHESTER OPTICAL CO.,  
50 South St., Rochester, N. Y.





**For Economy of Fuel and Percentage of Hard Burned Brick.**

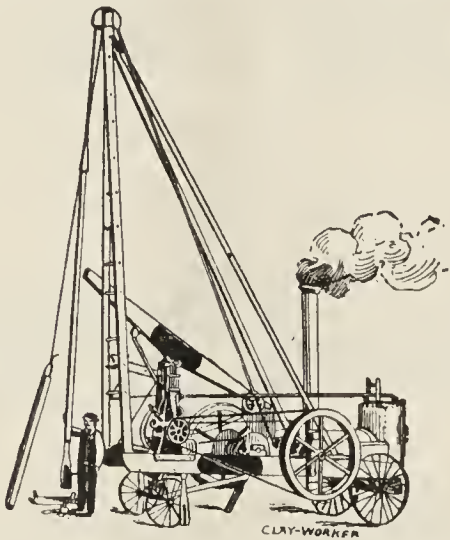
This kiln has no equal, come and see what we are doing.

**ALFRED YATES,**  
Man. Johnsonburg Vitriified Brick Co.,  
Johnsonburg, Penn.

**W. R. Osborne,**

Contractor for

Artesian Wells of any Diameter.



**PUMPS, WIND MILLS** with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

**152 State Street,  
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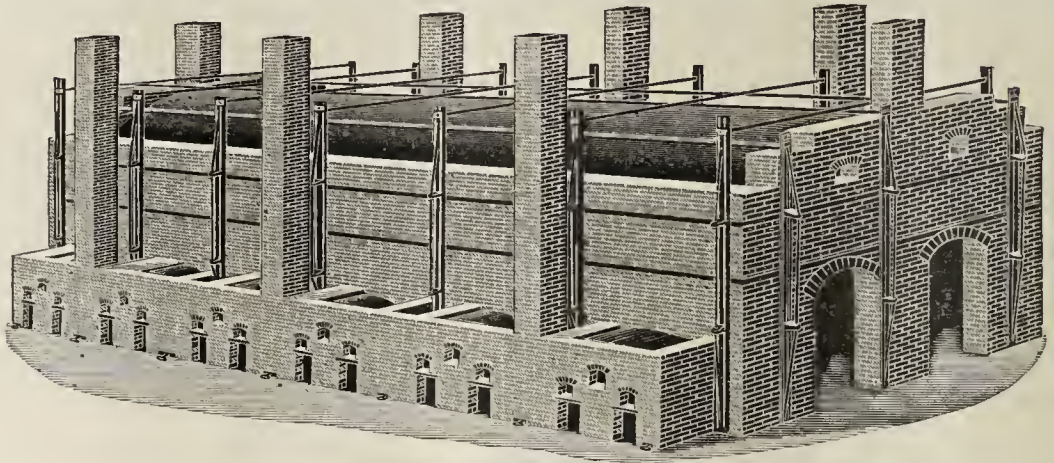
**COPPER,  
ZINC  
AND  
WOOD**

THESE ARE  
WHAT WE  
ENGRAVE  
ON.

REMEMBER:  
ONLY FIRST  
QUALITY.

INDIANAPOLIS  
ENGRAVING  
AND  
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COMPANY.

## The SWIFT SLACK COAL COKING TABLE FURNACE KILN.



Furnaces can be attached to either Up-draft clamp kilns, or round or square down-draft kilns. Have already changed a large number of kilns of almost every patent, both down-draft and up-draft, and one continuous kiln for the Galesburg Paving Brick Co.

**F. E. SWIFT, Washington, Ia., U. S. A.**

## The Perfect Clay Screen.

RECEIVED  
MAIN OFFICE RECEIVER OF  
THE COALDALE BRICK & TILE COMPANY  
MANUFACTURERS OF  
THE CELEBRATED COALDALE VITRIFIED SHALE PAVING BLOCKS  
BUILDING BRICK AND FIRE BRICK  
COALDALE JEFFERSON COUNTY, ALA. June 13, 1898. 189-

Messrs. Elder & Dunlap,  
Bloomington, Illinois.

Dear Sirs:-

The screen is working perfectly and has not given us a moments trouble since we began -- such a relief mentally, to what shaking screens did for us, we pronounce benedictions upon you every day.

As our regular voucher day will be the 20th, please send us invoice for the screen, and we will fix up acceptances and mail you on that day.

You may refer and Southern manufacturers to us, and we will be glad to let any of your prospective customers visit our plant and see it at work.

With best wishes, and again thanking and praising you for the benefit you have rendered the craft by this invention,

*James Foley* Yours truly,  
Agent.

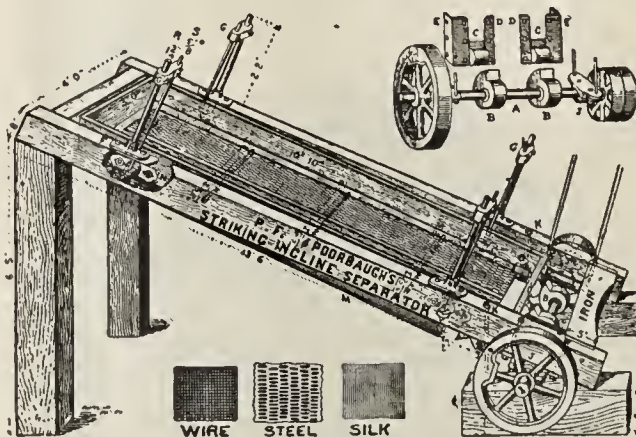
Read this testimonial it is just what all users of The PERFECT CLAY SCREEN have to say. If it is a benefit to the treasurer of The National Brick Manufacturers' Association it will benefit you.

For full information address

**ELDER &  
DUNLAP,**

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## STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

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These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

**THE PITTSBURG MINERAL SCREEN CO.**

Write for Prices,

PITTSBURG, PA.



FIRE

Dover Fire Brick Co.,  
INCORPORATED 1870. MANUFACTURERS OF  
Dover and Buckeye Fire Brick,  
Unexcelled for Kiln Purposes.  
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

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CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily \$1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually \$1.00 for any single list.

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TO KNOW how to sell BRICK to the Government?

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Yours very truly,

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A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

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| * 8:10 am              | 10:10 am           | 3:15 pm           |
| * 12:40 noon           | 2:35 pm            | 7:12 pm           |
| * 7:00 pm              | 8:55 pm            | 1:44 am           |
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| *Daily.                |                    |                   |

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

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| Mail and Express..... | 8.15 a m  |
| Accommodation.....    | 3.45 p m  |
| Fast Express.....     | 11.10 p m |
| ARRIVE.               |           |
| Fast Express.....     | 3.35 a m  |
| Accommodation.....    | 10.40 a m |
| Mail and Express..... | 4.40 p m  |

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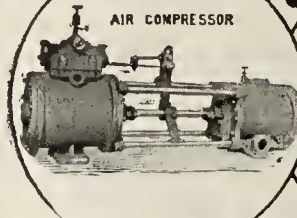
G. W. Hayler, D. P. A., Indianapolis, Ind.  
D. G. Edwards, Passenger Traffic Manager.

## S. GEYSBEEK,

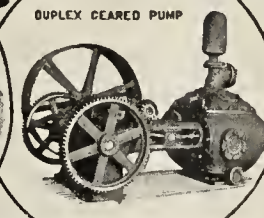
# Ceramic Chemist.

New Brighton, Pa.

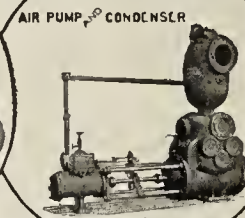
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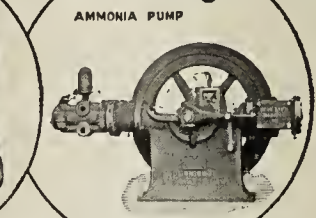
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PUMPING MACHINERY  
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## Make Money

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## Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;  
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

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# Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

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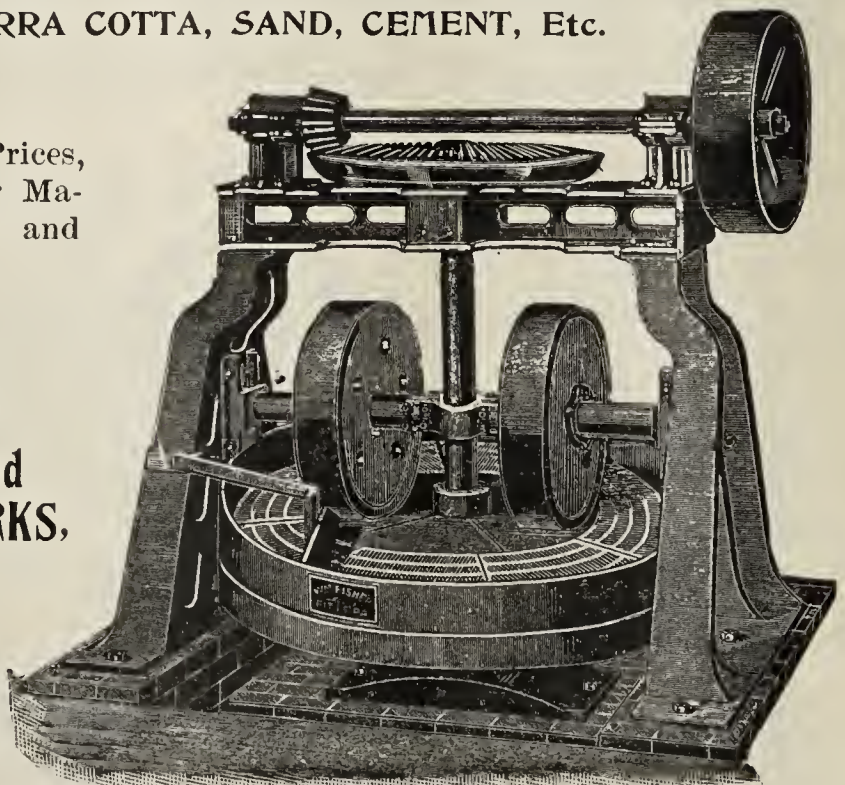
When writing for Prices,  
state kind of Clay or Material  
to be ground and capacity required.

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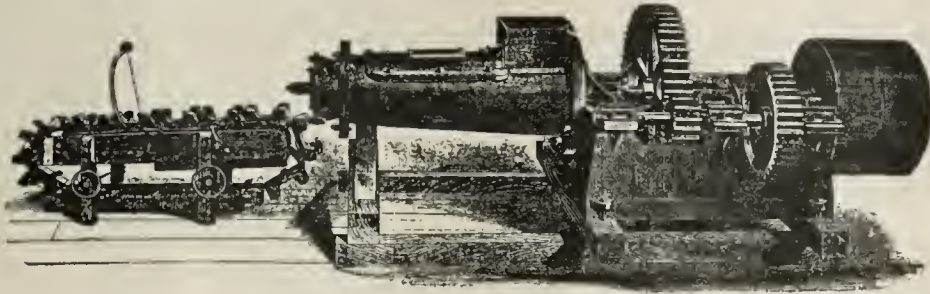


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## Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

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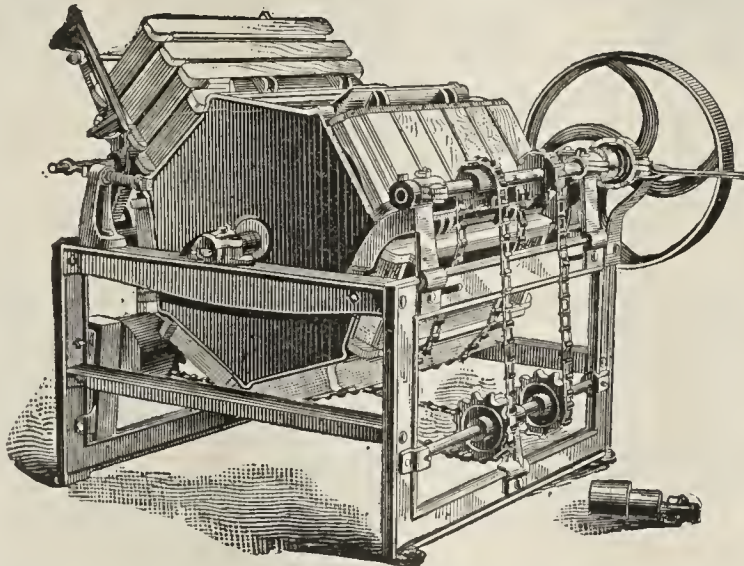
MADDEN & CO., Rushville, Ind.

### CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

**A. H. NEWTON,**  
Manager and Sole Agent,  
HAVERSTRAW, N. Y.



The case of Newton vs. Buck, has again been decided, February 4, 1898, by Judge Cox, in the United States Court, holding that Newton is the owner of patents, Nos. 284,115; 301,087; 272,698; and 407,030, and has the exclusive right to manufacture machines under these patents, and entitled to an injunction against Buck and all persons claiming through or under him, from making, using or selling the Buck machines, and for damages for past infringements. This is absolutely the end of the long litigation between Newton and Buck and every point is decided in favor of Newton.

We own and control nine patents, and all sanding machines employing either the cylinder or the feed rack, infringes some one or more of these patents, and all persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages against all infringements.

### Elevators

For handling  
CLAY,  
COAL,  
SAND,  
BRICK,  
TILE,  
PACKAGES.

Also Furnish  
RUBBER,  
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COTTON  
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For long and short  
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**SPLENDID LOCATIONS**

For the manufacturing of either of the above along the lines of the

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Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road.

For particulars write  
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—AND—  
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Through tickets sold to all points in the United States and Canada.

#### NORTH BOUND—LEAVES.

|                        |            |
|------------------------|------------|
| o. 20 Passenger.....   | 7:00 a. m. |
| *No. 22 Passenger..... | 1:20 p. m. |
| No. 24 Passenger.....  | 7:00 p. m. |

#### SOUTH BOUND—ARRIVES.

|                        |             |
|------------------------|-------------|
| *No. 21 Passenger..... | 10:20 a. m. |
| No. 23 Passenger.....  | 2:50 p. m.  |
| No. 25 Passenger.....  | 6:20 p. m.  |
| *Daily.                |             |

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Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

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C. F. DAILY, Gen. Pass. Agt.  
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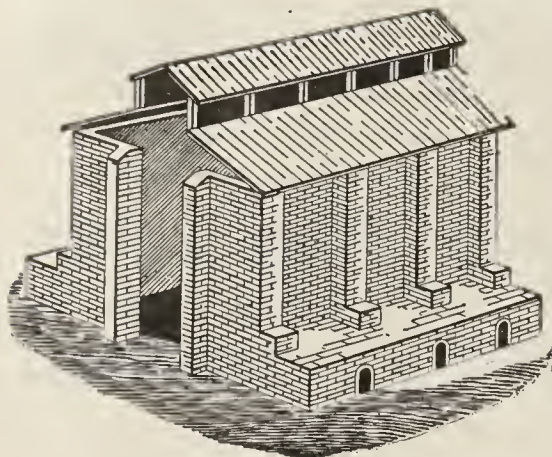
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HAVE A SHARP  
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Mention the CLAY-WORKER  
WHEN WRITING TO ADVERTISERS,  
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Up-Draft Kiln.

## LOUIS H. REPELL'S IMPROVED-KILNS

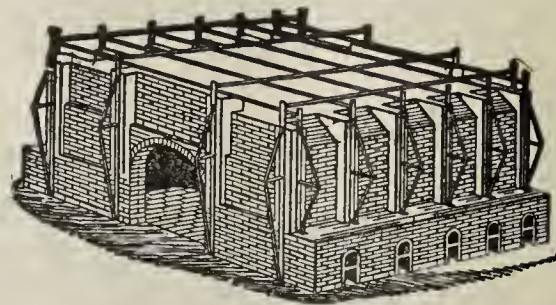
For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

# The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

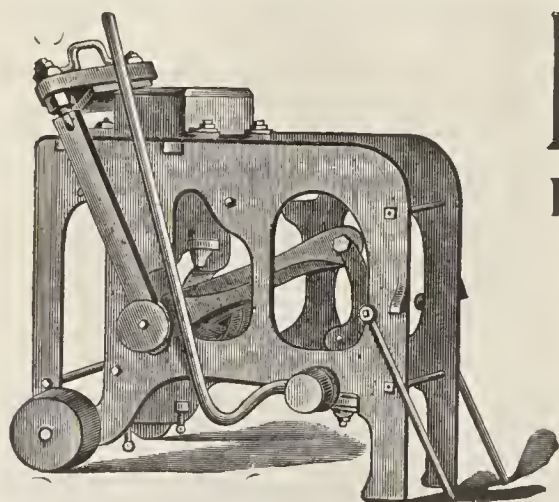
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

Days Brick Works.

— BELLEVILLE, ILL.



RED BRICK PRESS.

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Nos. 1,819, 1,821 and 1,823 Germantown  
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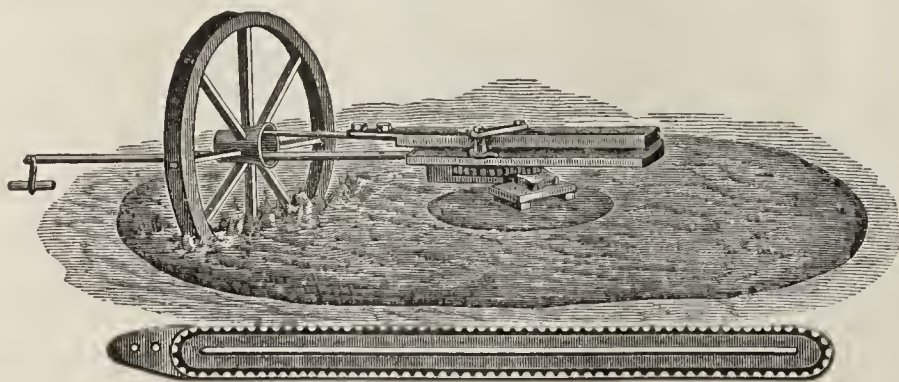
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## PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

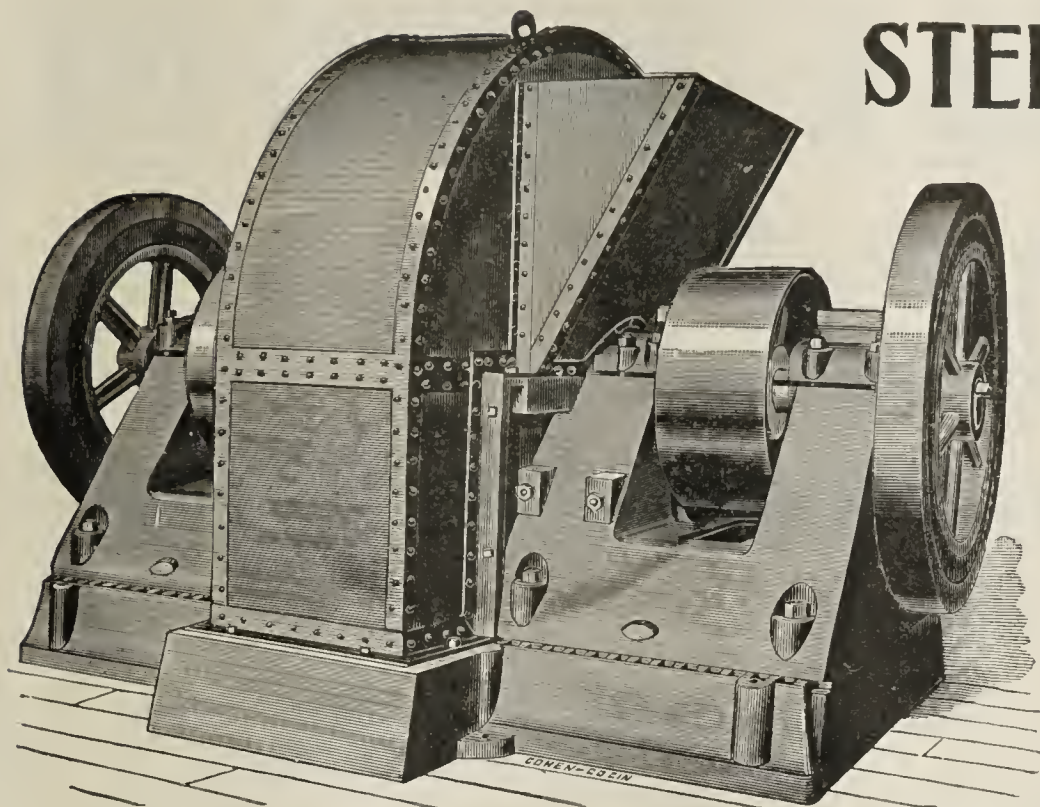
Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.





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For Thoroughly  
Pulverizing Clay in a  
Dry, Semi-Dry or  
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

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## The "New South" Brick Machinery

Manufactured by

**J. C. STEELE & SONS,**  
Statesville, N. C.

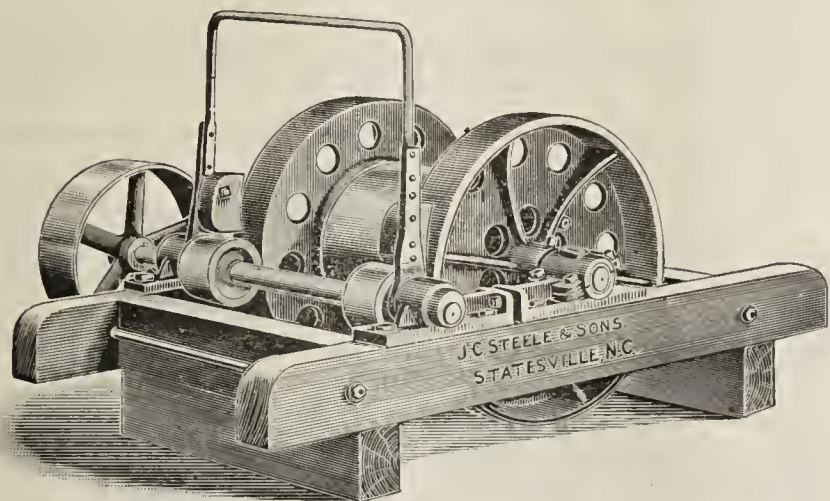
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Twenty-four outfits of Brick Machinery sold in six months, besides many of our new Double Friction Winding Drums (of which cut is here shown,) and lots of our Iron Frame Revolving Clay Cars, not to mention Brick Trucks, Automatic Cutters and other Brickyard equipments.

Let us make your acquaintance.

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J. C. STEELE & SON, Statesville, N. C.



New Double Friction Winding Drum.

## The Standard Brick Machines,

MANUFACTURED BY

**A. M. & W. H. WILES CO.,**  
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

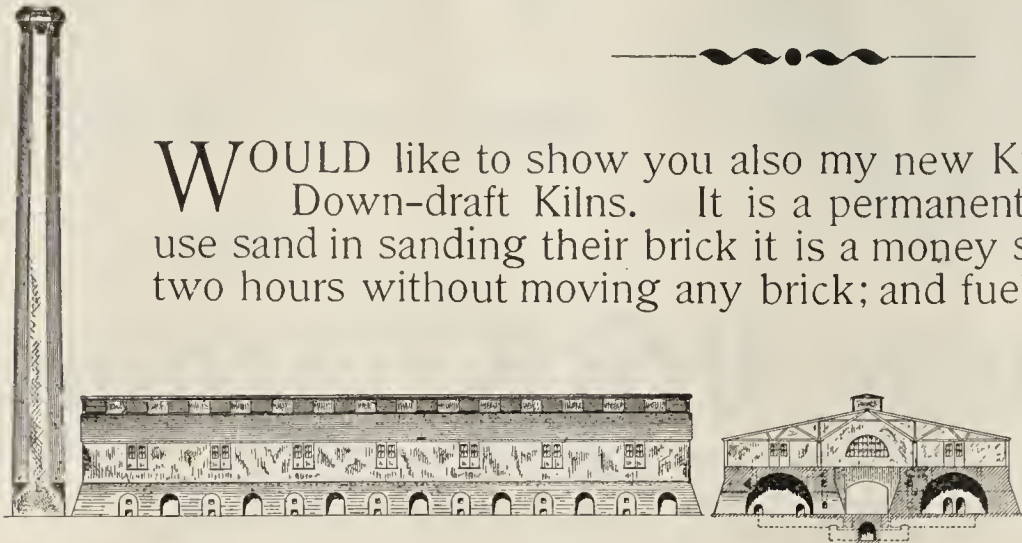


# HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



WOULD like to show you also my new Kiln Floor for Round or Square Down-draft Kilns. It is a permanent floor, to any one who has to use sand in sanding their brick it is a money saver, a floor can be cleaned in two hours without moving any brick; and fuel is saved in the burning of the product, and a great deal of annoyance saved in leveling etc., for dry pressed and other high grades of brick.

Address **H. HAIGH, Catskill, N. Y.**

## The Lehmann <sup>Portable</sup> <sub>Continuous</sub> Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

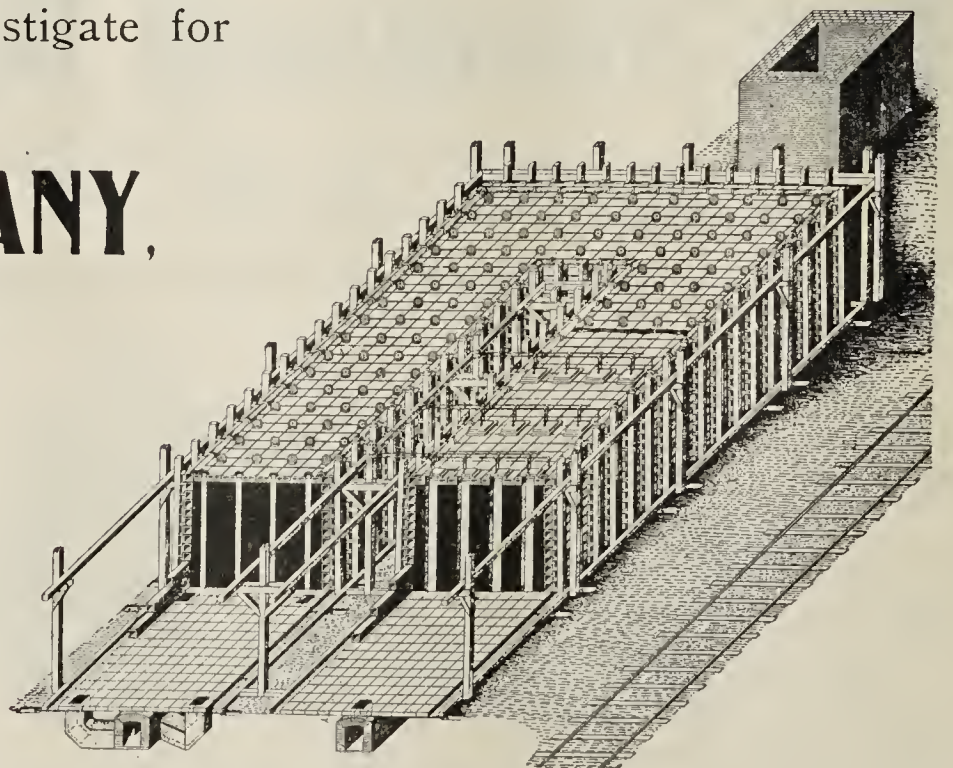
### F. LEHMANN & COMPANY,

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Kiln Builders, Consulting Clayworker Engineers,  
Plans and estimates furnished for Brick, Lime and  
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.





# Morrison's Latest

## Improved Kiln,

### FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

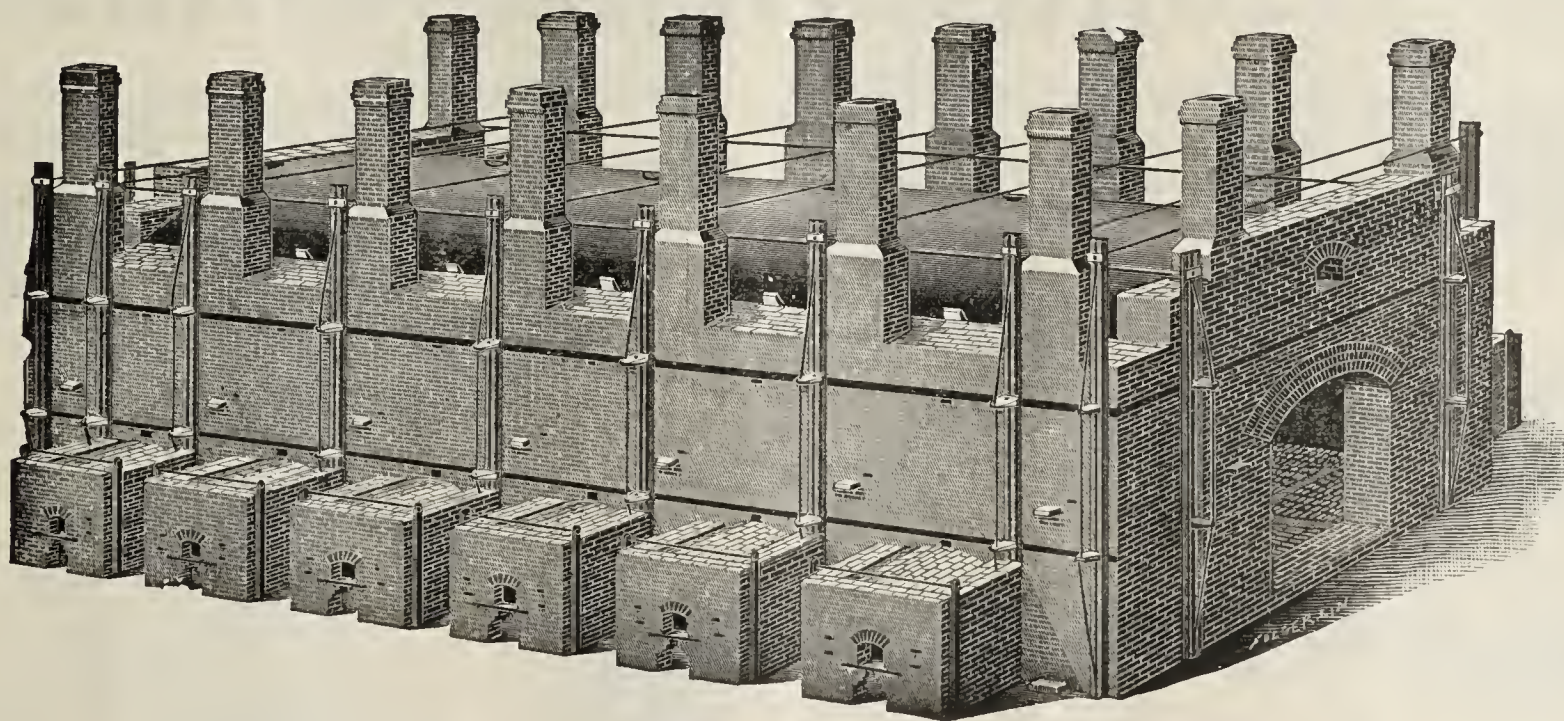
**R. B. MORRISON & CO.,**

*P. O. Box 335.*

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## The EUDALY

IMPROVED —  
DOWN-DRAFT KILN  
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

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run the lines of the  
Illinois Central Railroad and the Yazoo & Mis-  
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| South Dakota                  | Kentucky    |
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Presenting an unequalled territory for diversi-  
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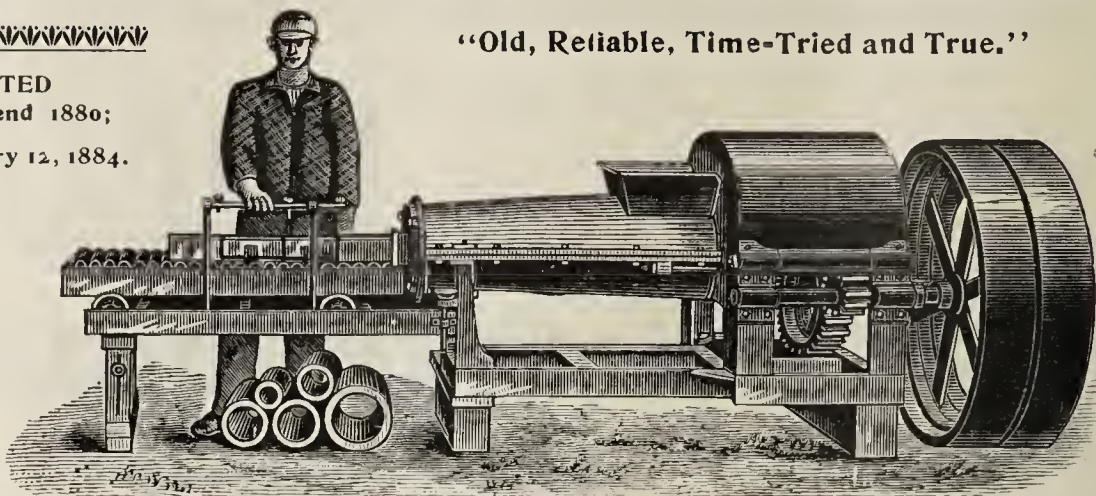
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Distributing Centers.  
Intelligent Help of all Kinds.  
Many Kinds of Raw Material.**

To sound industries, substantial induce-  
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## KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

~~~~~

PATENTED
June 22nd 1880;
and
February 12, 1884.



"Old, Reliable, Time-Tried and True."

P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works elay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by ehanging dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

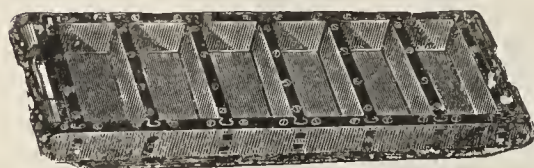
For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

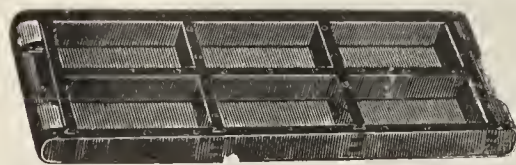
H. C. BAIRD & SON,
PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above
machines, also makers of the New Quaker Brick Machine.

D^{O....} YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



61 Brick Hand Mold



3 Brick Hand Mold.

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see?"

We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

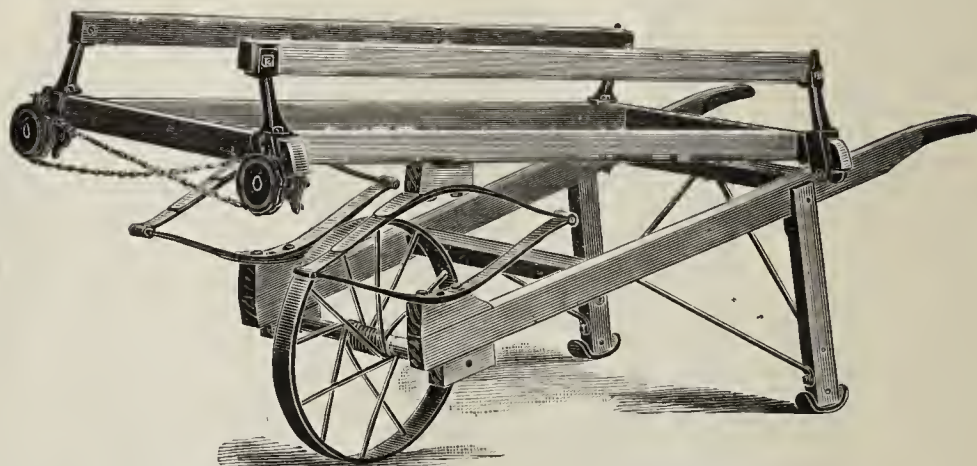
future delivery desired now. We make the best

➔ Moulds, Trucks
and Barrows,

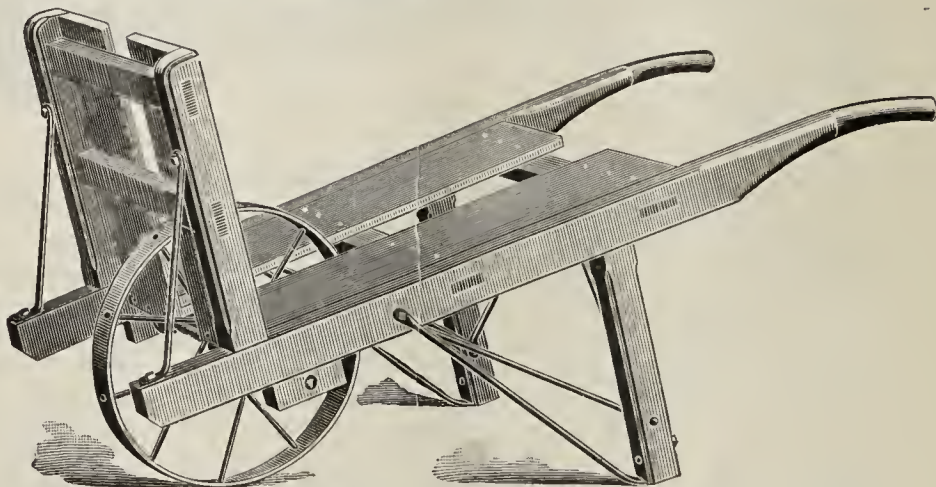
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



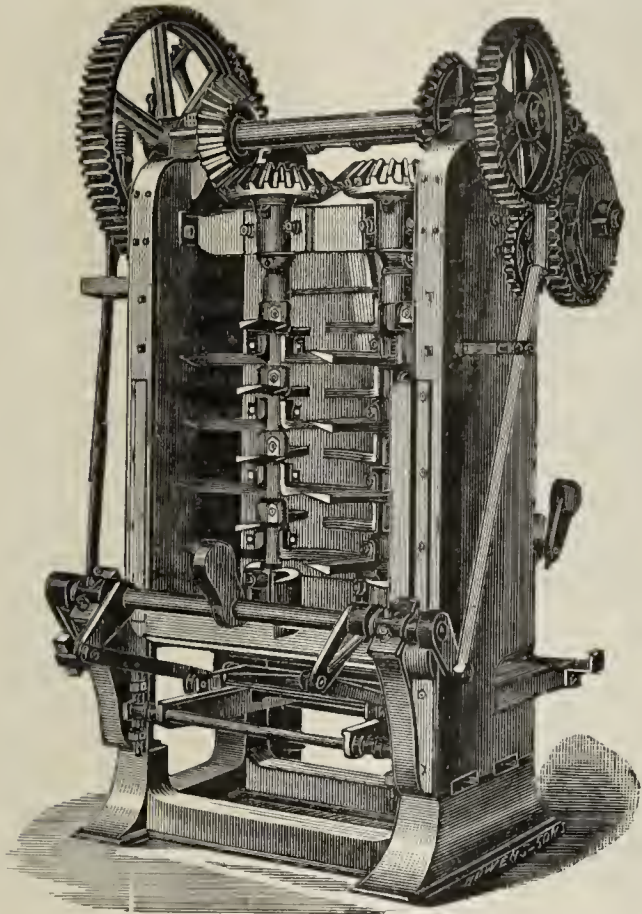
No. 4 Pallet Truck.



No. 4 Brick Barrow Price \$5.00
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



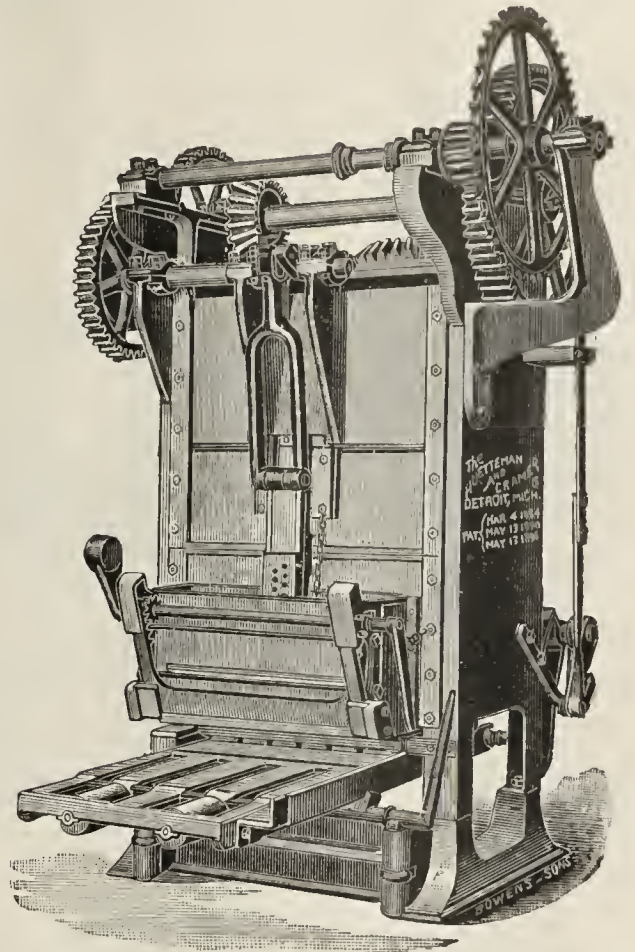
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE
AND PRICES TO

The Huetteman
& Cramer Co.,

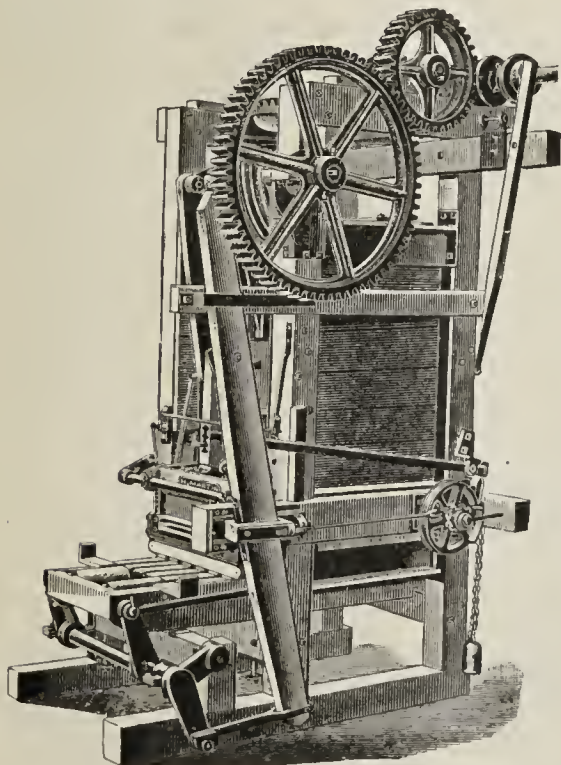
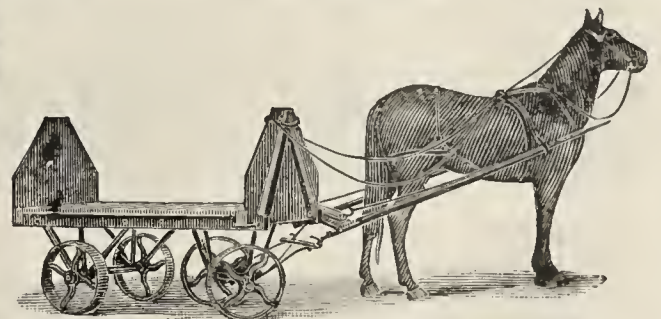
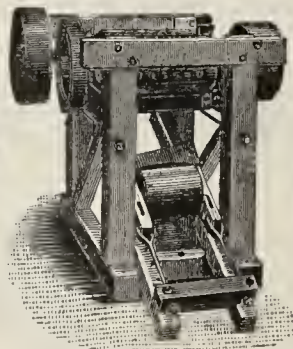
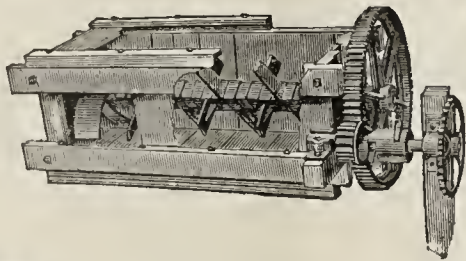
Manufacturers of the Duplex Brick Machine and general outfit for
brickyards,

12, 14 & 16 Sherman St.,
DETROIT, - - MICH.



Everything

A Brickmaker Needs are
our Specialties.



MARTIN'S "A"

Steam Power Brick Machine.
Capacity 50,000 per day.

THE

Henry Martin Brick Machine Mfg. Co.,

Incorporated,

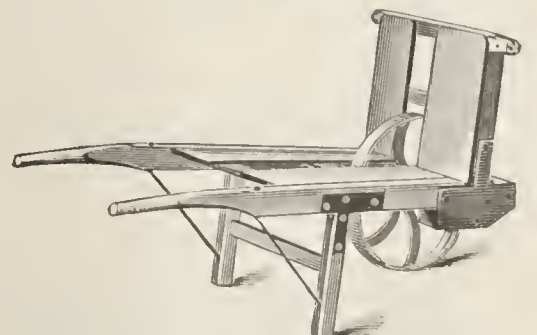
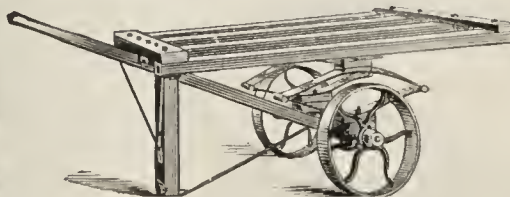
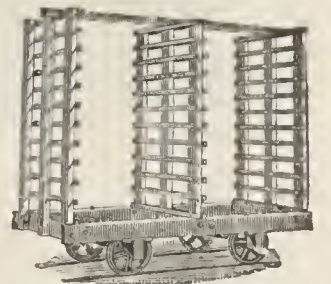
Lancaster, Pa., U. S. A.

CABLE ADDRESS "MARTIN LANCASTER," LILBER CODE USED.

BEFORE

Placing your orders for any Brick
yard Supplies, be sure to write us.

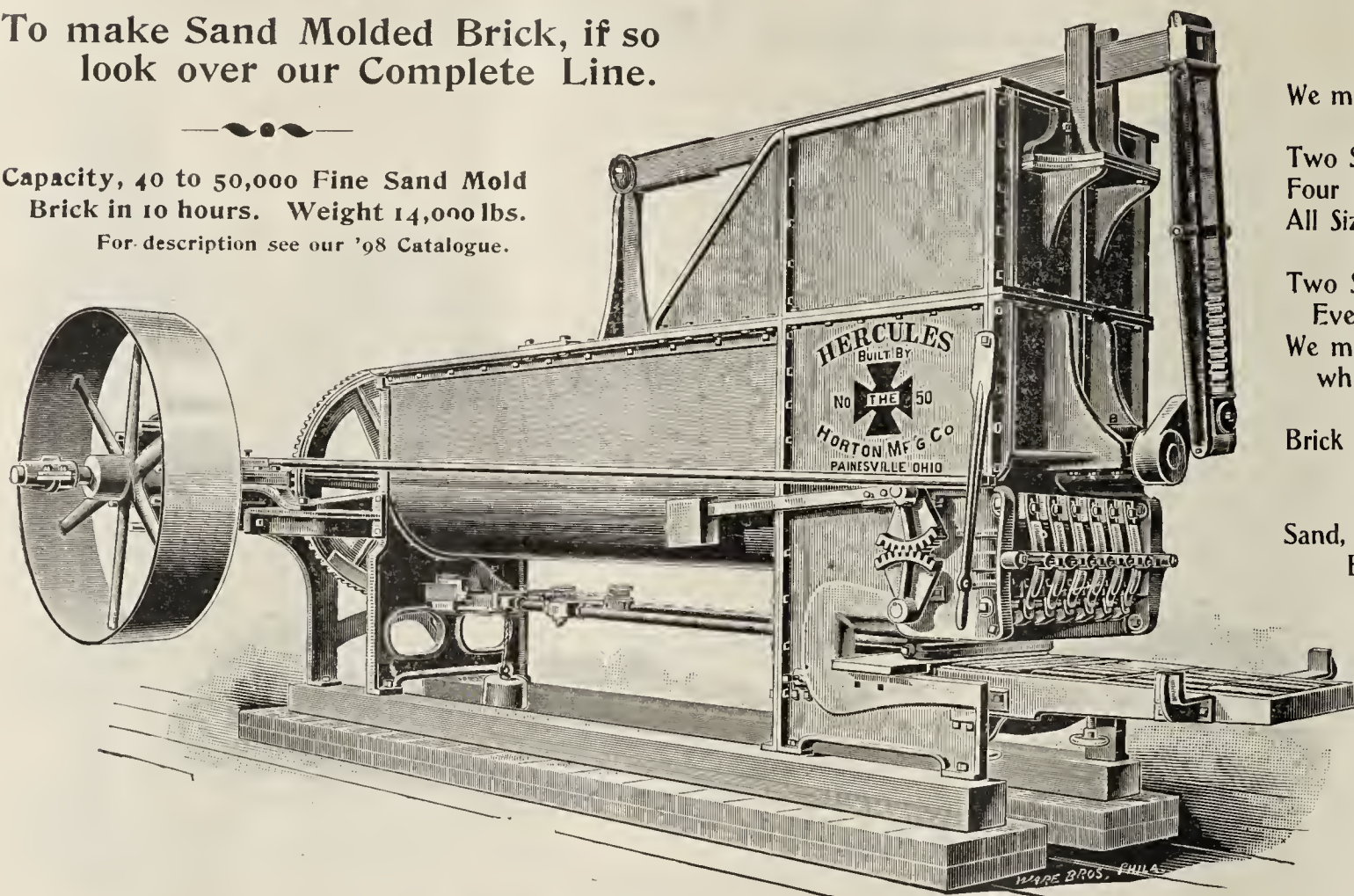
Machine Moulds at greatly reduced prices.



Do You Want the Best Machine on Earth?

To make Sand Molded Brick, if so
look over our Complete Line.

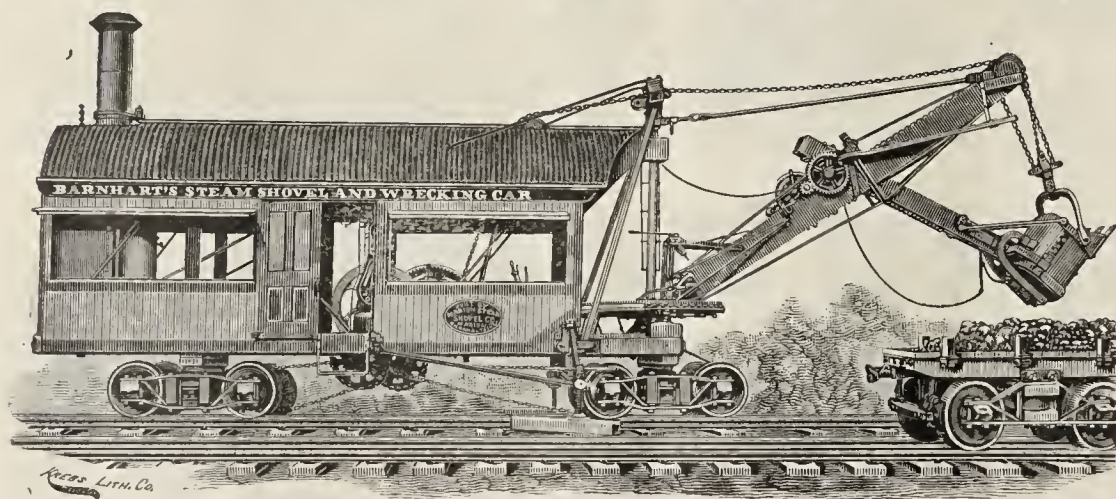
Capacity, 40 to 50,000 Fine Sand Mold
Brick in 10 hours. Weight 14,000 lbs.
For description see our '98 Catalogue.



We make Seven Styles
of Brick Machines.
Two Styles Mold Sanders.
Four Sizes of Disintegrators.
All Sizes of Pug Mills.
All Styles of Elevators.
Two Styles of Hoists.
Everything in Dump Cars.
We manufacture Molds,
which have no equal in
Quality and Price.
Brick Wagons.
Dump Tables.
Brick Pallets.
Sand, or any Style of
Barrow used on a Yard.
Double and Single
Deck Pallet Trucks.
Kiln Grates, Doors
and Frames.
Shafting, Hangers,
Pulleys, Etc.
Boilers and
.... Engines.

The HORTON MANUFACTURING CO., Painesville, Ohio.

Steam Shovels for Brickyards.



STYLE A-1½ YD.

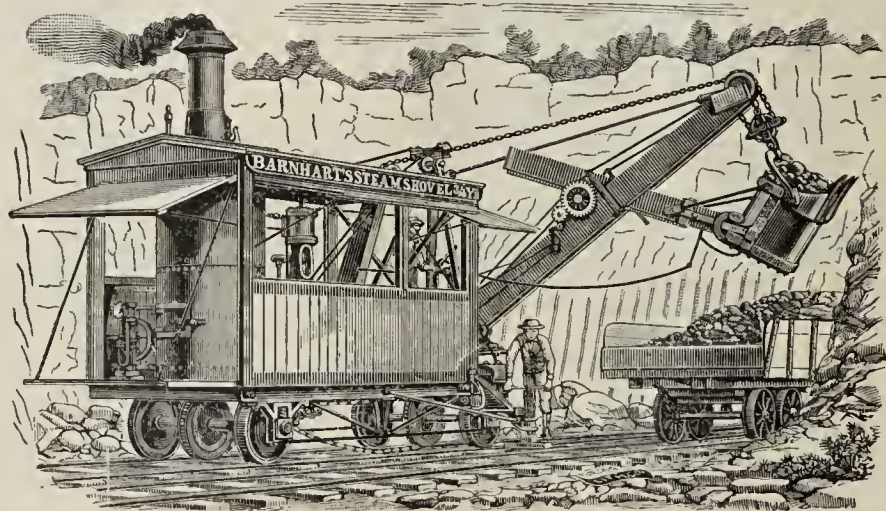
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

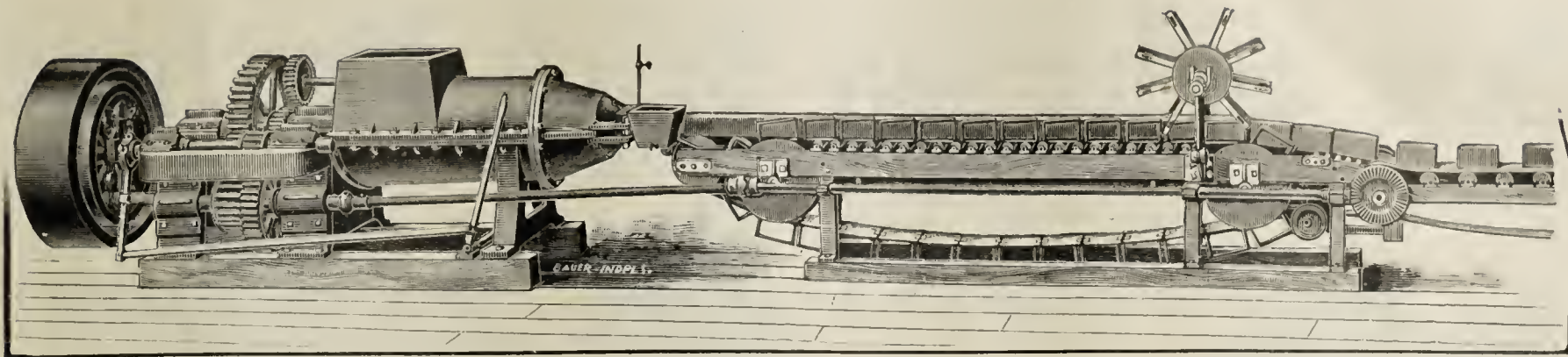
The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C-¾ YD.

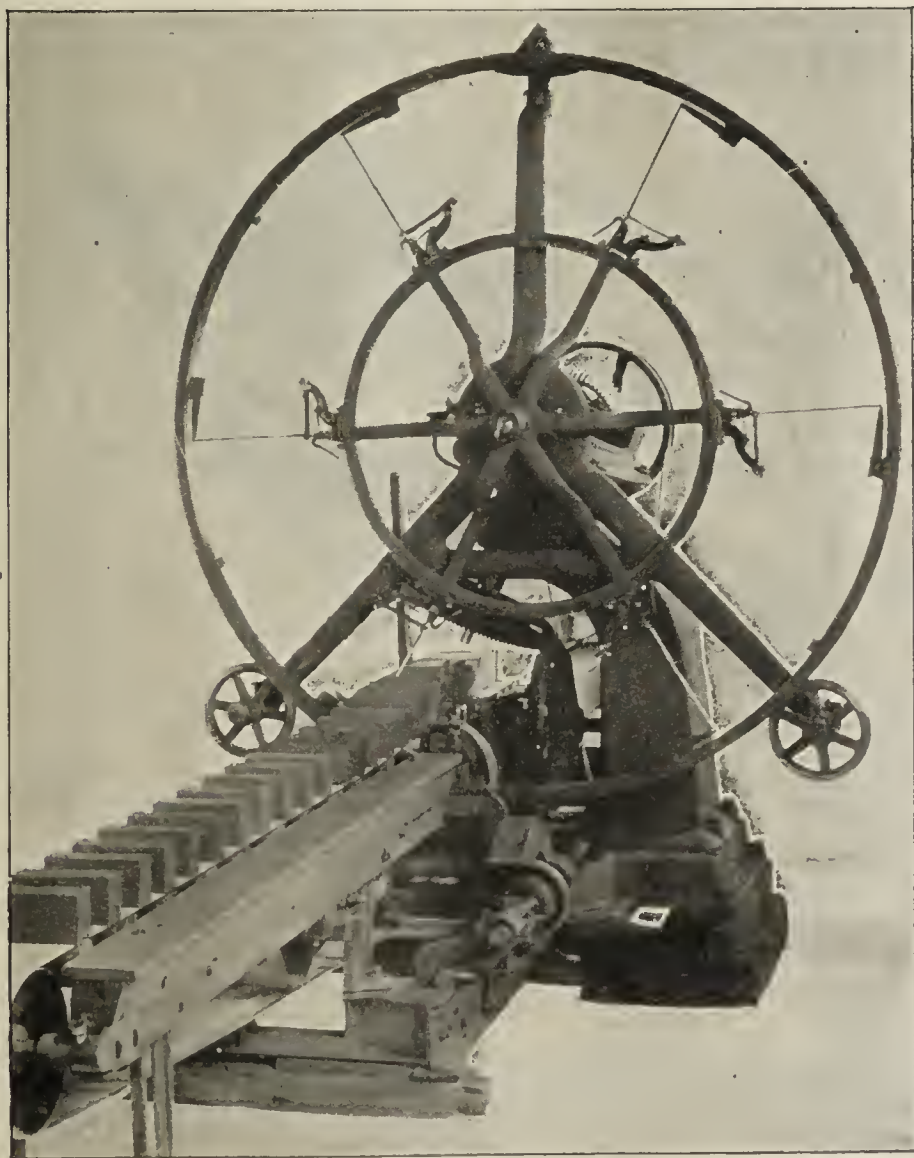


Leader No. 50, With End Cut Automatic Cutter.

We have manufactured this machine during the last eight years and it continues to give universal satisfaction. For the season of 1898 we have some improvements. They consist chiefly of an increase in the weight and strength of the machine, a wrought iron platform covering for the gears so that falling particles of dust and other bodies are successfully kept from contact with the gearing and bearings, and at the same time free access can be had to both for lubricating and inspecting purposes, as well as for taking up the wear. This machine is complete in every detail and ample in strength, has roller feeder in hopper, hinged die-front with safety pin double end-thrust bearings and friction clutch pulley. An automatic cutter is required with this machine owing to its large capacity, which is from 40,000 to 50,000 brick per day, and fifty horse power is required. Floor space required 13 x 6½ feet; height, 4½ feet; size of pulley 54 x 12 inches; speed about 200 revolutions per minute; approximate weight 12,000 pounds.

The End Cut Automatic Cutter Is simple in construction and operation, and can be set up by any ordinary mechanic. The wires are guided in such a way as to make a straight cut of uniform length. Cutting always downward on the face of a flexible belt, it is not liable to tear the bottom edge, and in returning the wires do not come in contact with either end of the severed brick. All motions are continuous, hence the speed at which it will work is practically unlimited. It is very sensitive to any variations of speed in the columns of clay. The wires can be renewed when worn or broken, while running at full speed, and without the use of tools. A sander is supplied when desired. The off bearing portion of the table will be made of suitable length. Twelve feet is included in the price of the complete table, and an extra charge will be made for additional length. The dimensions will vary slightly according to the length the brick are to be cut. Length of end of die to center of cutter is nine feet. Length over all 21 feet. Height to top of belt 31 inches. Height over all 5 feet. Size of pulley 8 x 4 inches. Speed about 100 revolutions per minute. Weight 1,800 pounds. Send for printed matter and larger cuts.

LEADER MANUFACTURING CO., Decatur, Ill.



The Chambers Automatic Side-Cutter.

Automatic Side-Cutter For Stiff-Tempered Brick Machines.

A **ROTARY CUTTER**, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

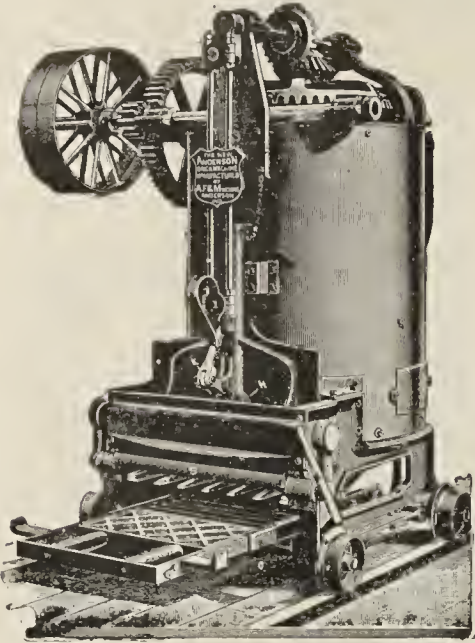
The machinery is above the dirt and all gearing encased.

MANUFACTURED and
GUARANTEED. . . .

Chambers Brothers Co.,
PHILADELPHIA, PA.

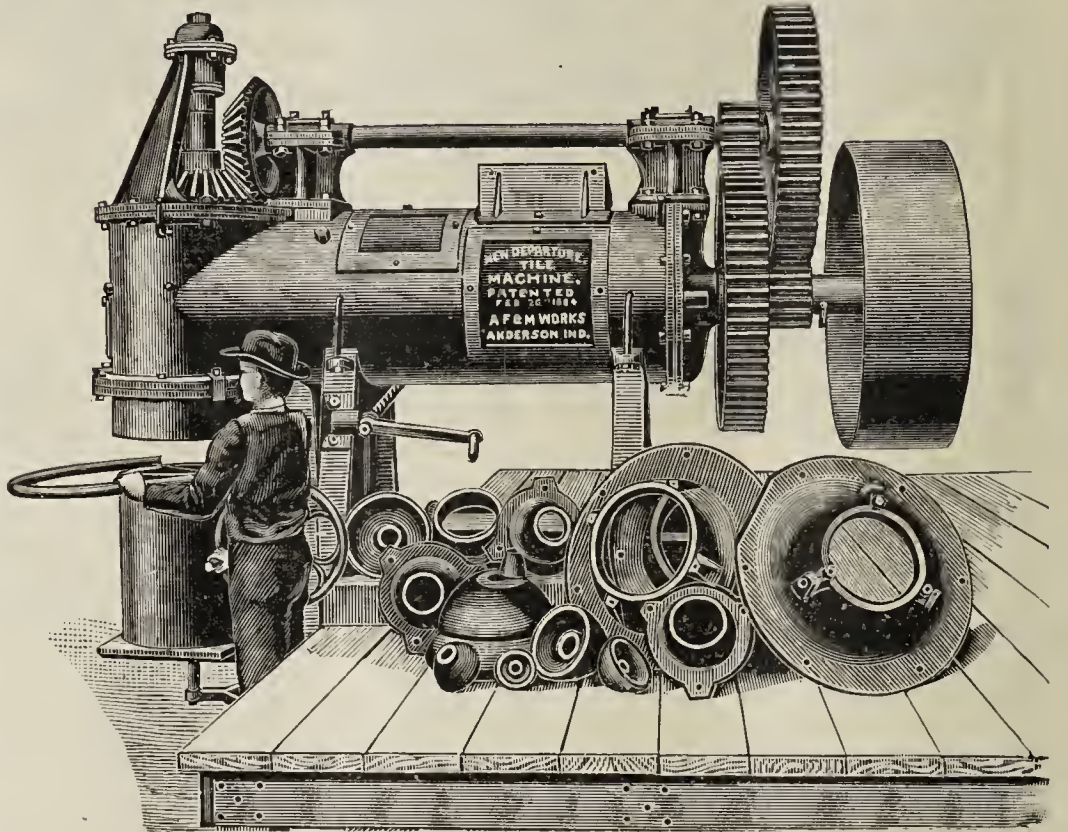
New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

The Past and
the Future



In the Past

Cutting
BICYCLES.

Have given universal satisfaction.

In the Future we agree to protect you by our liberal guarantee.

Six models to select from \$35, \$45, \$60.

We refer by permission to the editor of the CLAY-WORKER.

Get our Catalogue.

These wheels are fitted with gear cases and the Willits Rear Hub Brake.

A full line of Cycle Sundries.

Get our Sundry Catalogue.

HAY & WILLITS MFG. CO.

West 18th St. and Belt Railroad, INDIANAPOLIS, IND.



SPAIN SENDS OUT PEACE PROPOSALS.

Peace Restored!

Peace is in sight! A declaration of peace means far more than a cessation of war. It means renewed business activity. It means an extension of our commerce. It means a new awakening. An advancement all along the lines of business. You should be ready for the new era. The time is ripe to make those changes you have needed.

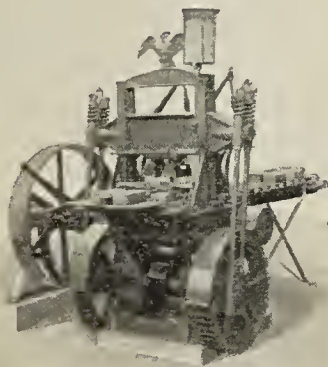
We have witnessed the supremacy of The American Eagle in war and are again ready to have it perch in peace over a land of plenty. We are ready for the shriek of shells to give way to the hum of industry. We are ready for the smoke of battle to be supplanted by the smoke of manufacturing. We are ready for the army of soldiers to return to their benches, forges, desks and offices. The touch of war has embued the business world with a new activity, a new aim for success. In war it's the man who is in the front rank who gets the most honor. In peace it is the man who is in the front rank of business, ever striving to advance, who plants his flag upon the citadel of success. If you want to advance, if you are striving for success, the American Eagle will help you. Not the eagle which screams for the flag alone but the Eagle Repress which never tires of its efforts in behalf of the clayworkers of the country. Like its namesake, the Eagle Repress is supreme—always victorious, never vanquished. Look up the reputation of this Repress, we court inquiry. It's a machine built on correct principles, no faulty mechanism, traps or triggers. Guaranteed to give perfect satisfaction. The success of this machine is equaled by the other machines we make. Write to-day for particulars on our Dry Press, Stiff and Soft Mud machinery. They are "Built Right and Run Right," and peace everlasting will be yours if you are equipped with our machines.



FIRST IN WAR,
FIRST IN PEACE.

NO RECORD CAN APPROACH IT.

THE MORE YOU FIND OUT
ABOUT THE EAGLE THE
BETTER YOU'LL LIKE IT.



THE PEER OF REPRESSES.

SEVEN IN ONE FACTORY, 13 IN
ONE TOWN. 7 RUN CONTINU-
OUSLY FOR A YEAR WITH ONLY
60 CENTS FOR REPAIRS.

THESE ARE WORLD'S RECORDS
ON REPRESSES.

GET THE EAGLE AND YOU'LL
HAVE A LIFELONG FRIEND.

The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

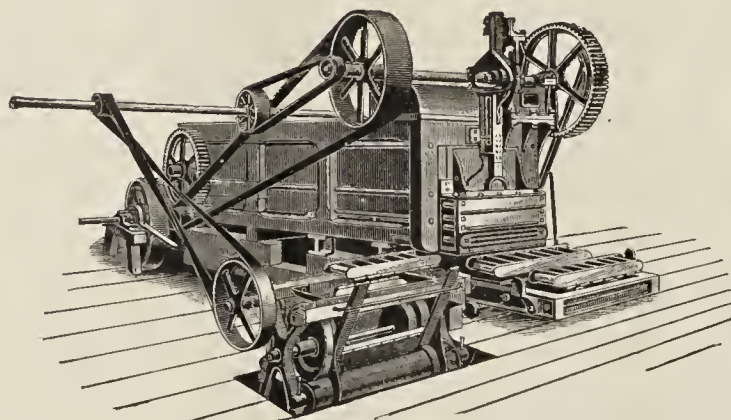
DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

.. THE ..

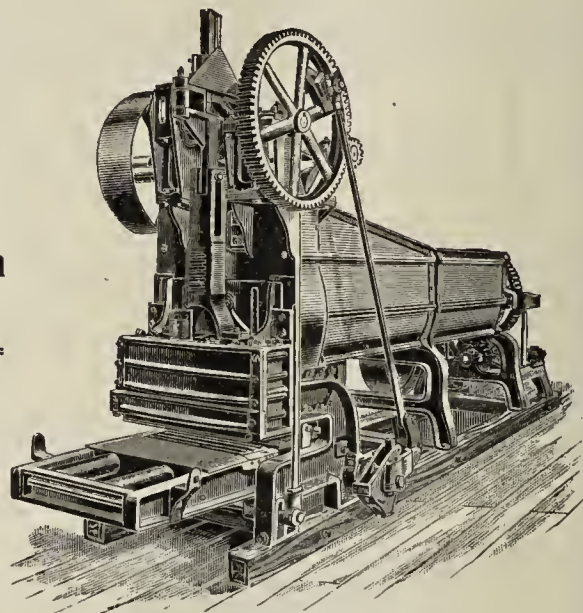
POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

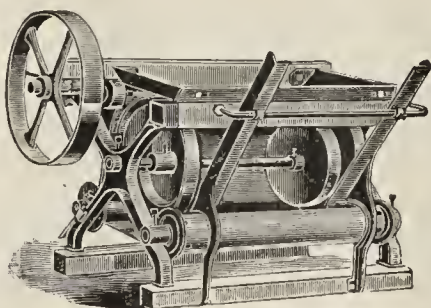
They have no equal
for making Brick which
have Clean, Sharp Cor-
ners and Smooth
Surfaces.



Iron Frame Pug Mill.

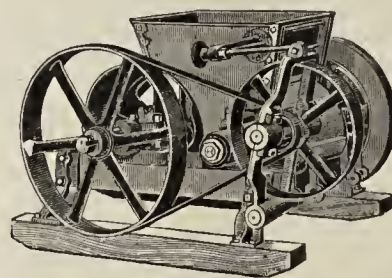
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



Disintegrators,

Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

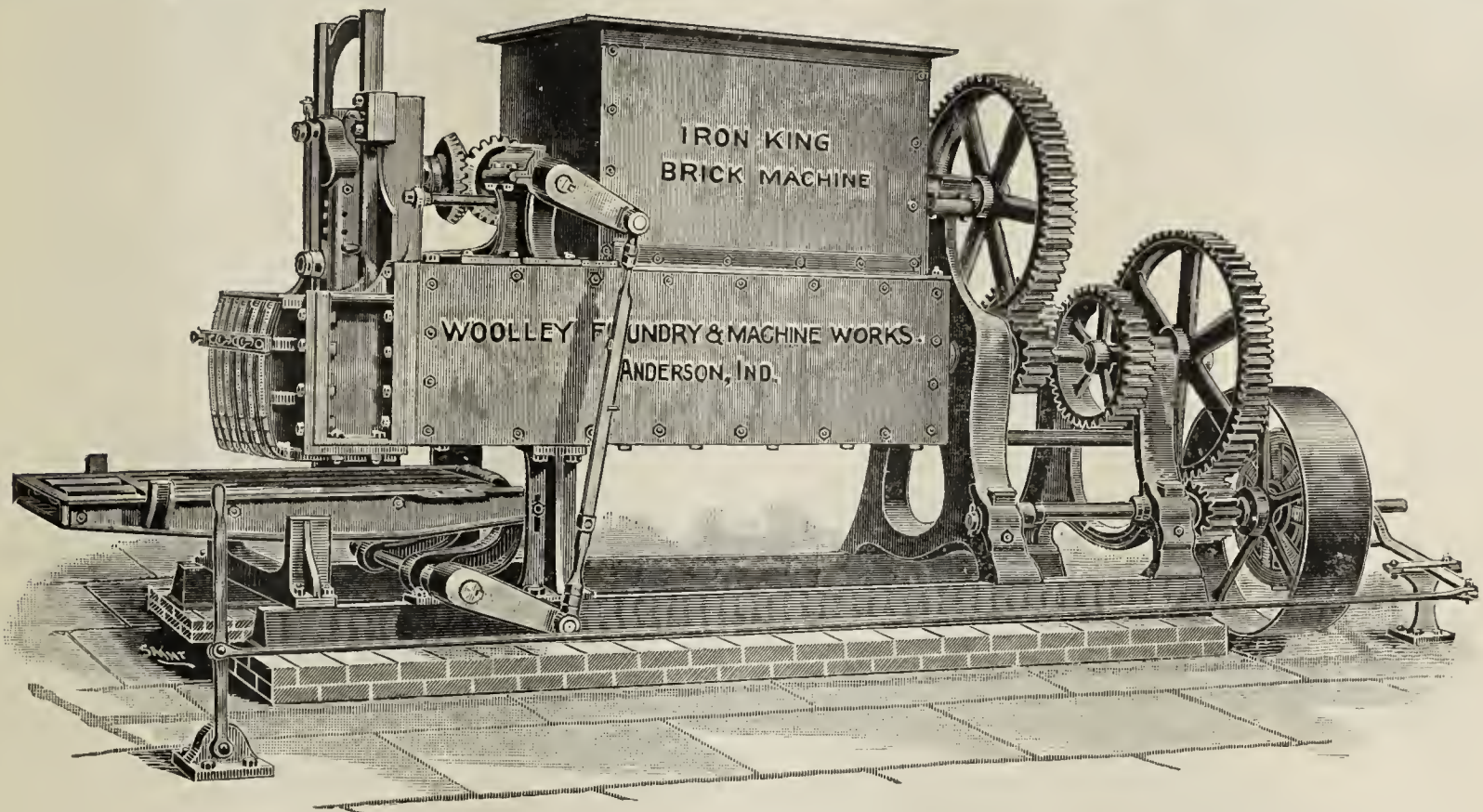
For terms and prices of anything needed on the brickyard write

C. & A. POTTS & CO., 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**

SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “**IRON KING**” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

WOOLLEY DRY PANS,
PUG MILLS,
SLIP PUMPS
and PRESSES

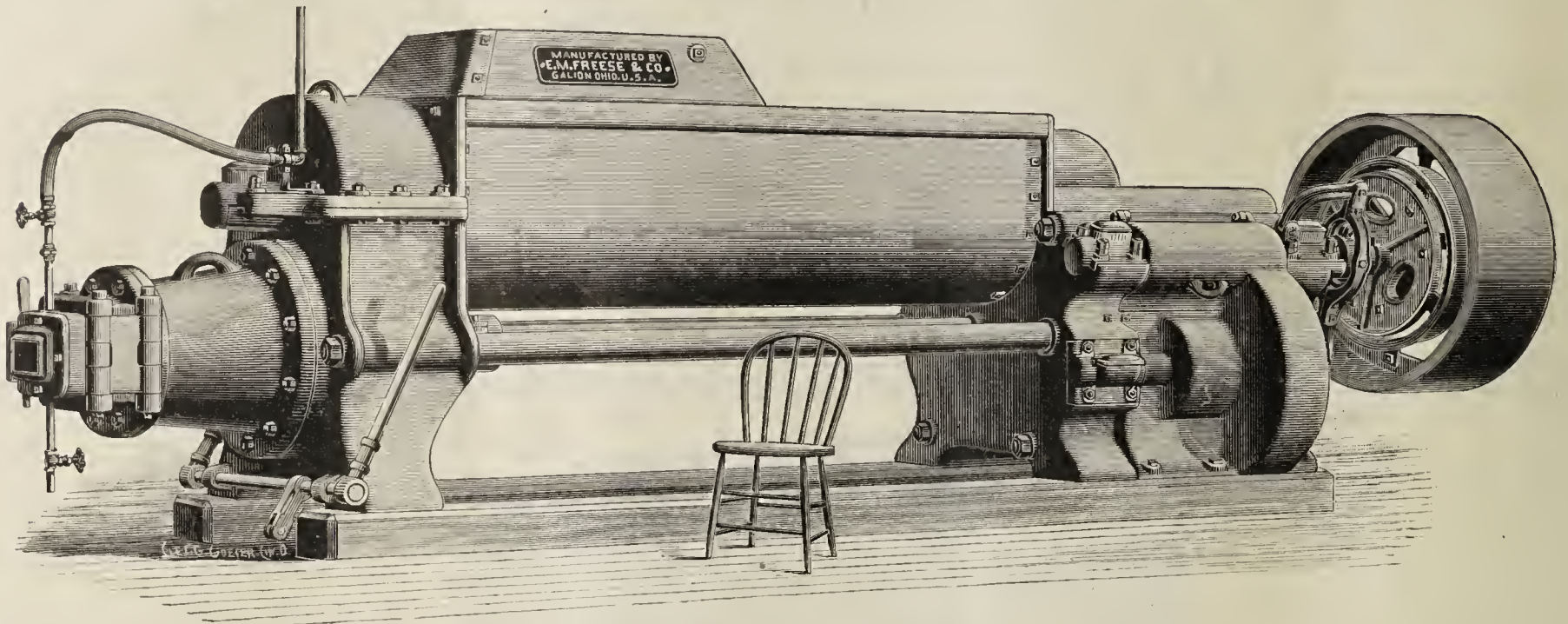
Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

Mention the Clay-Worker.

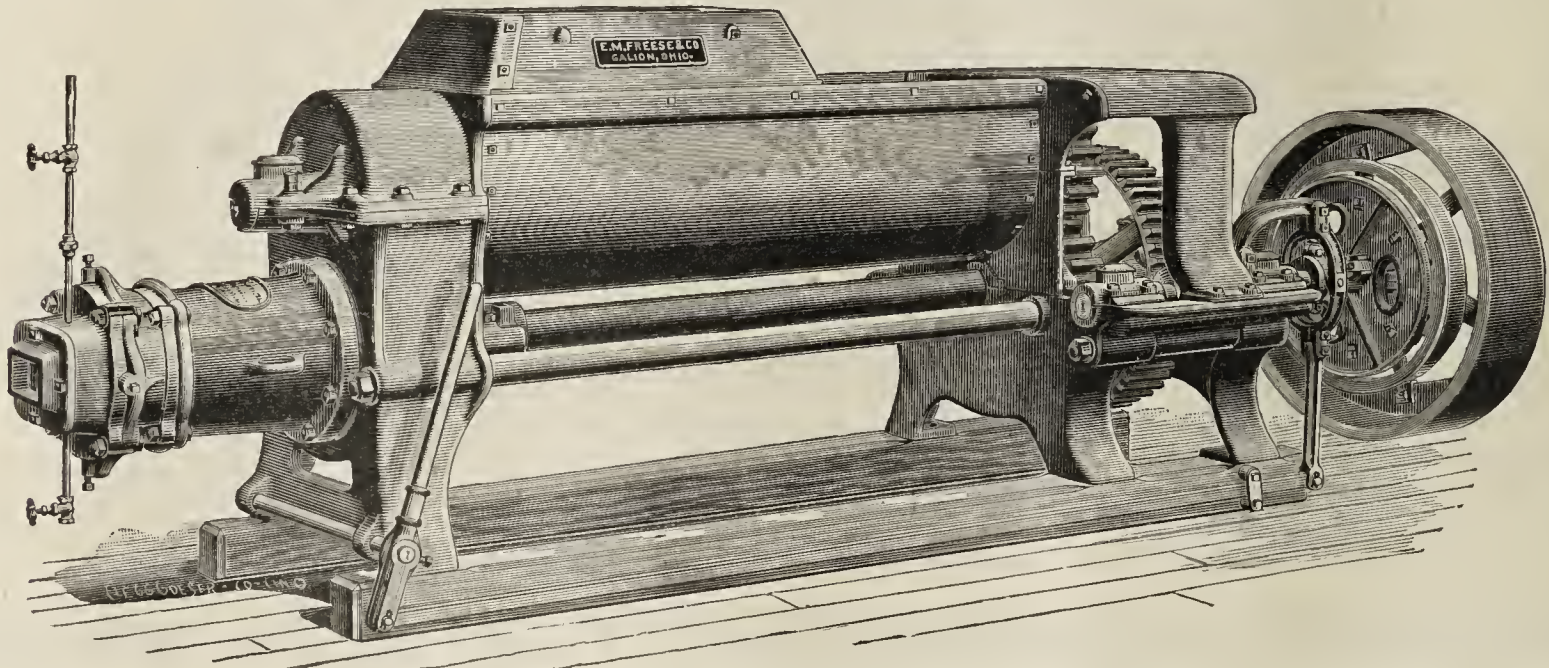


The Original Union Brick Machines



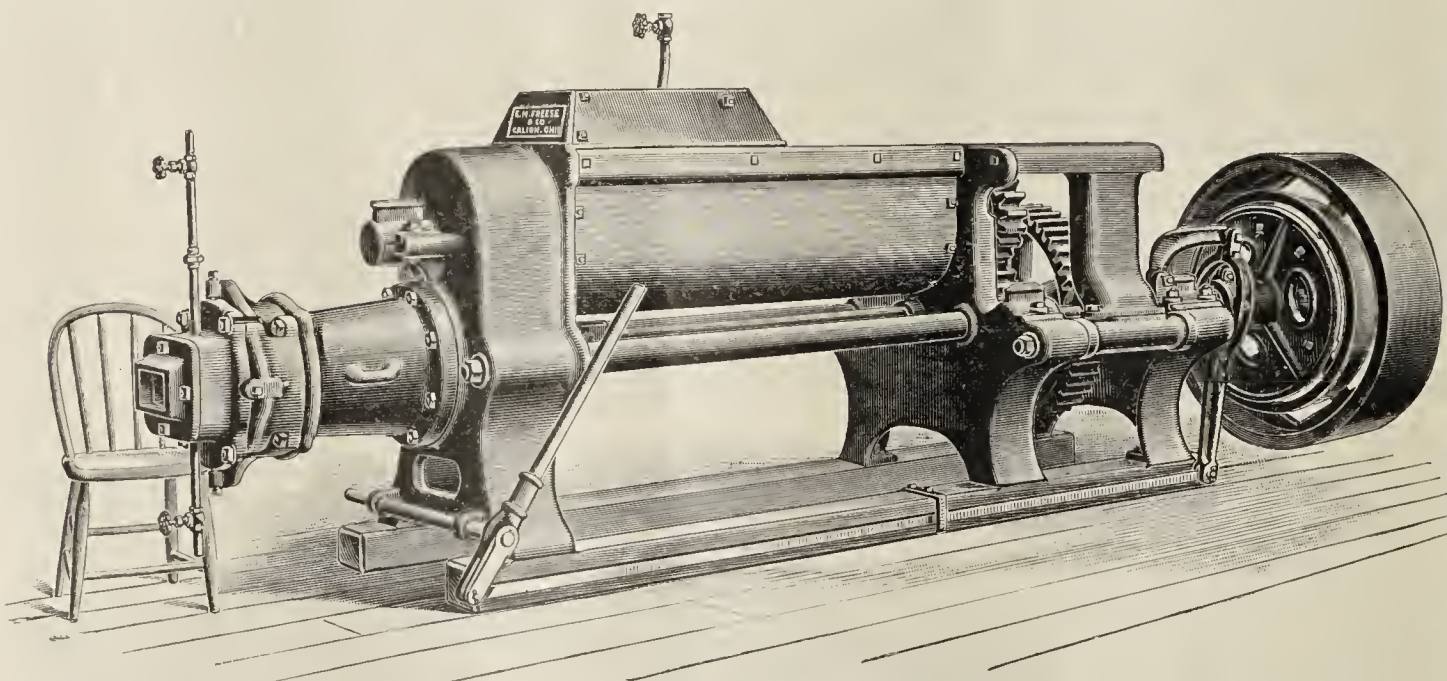
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

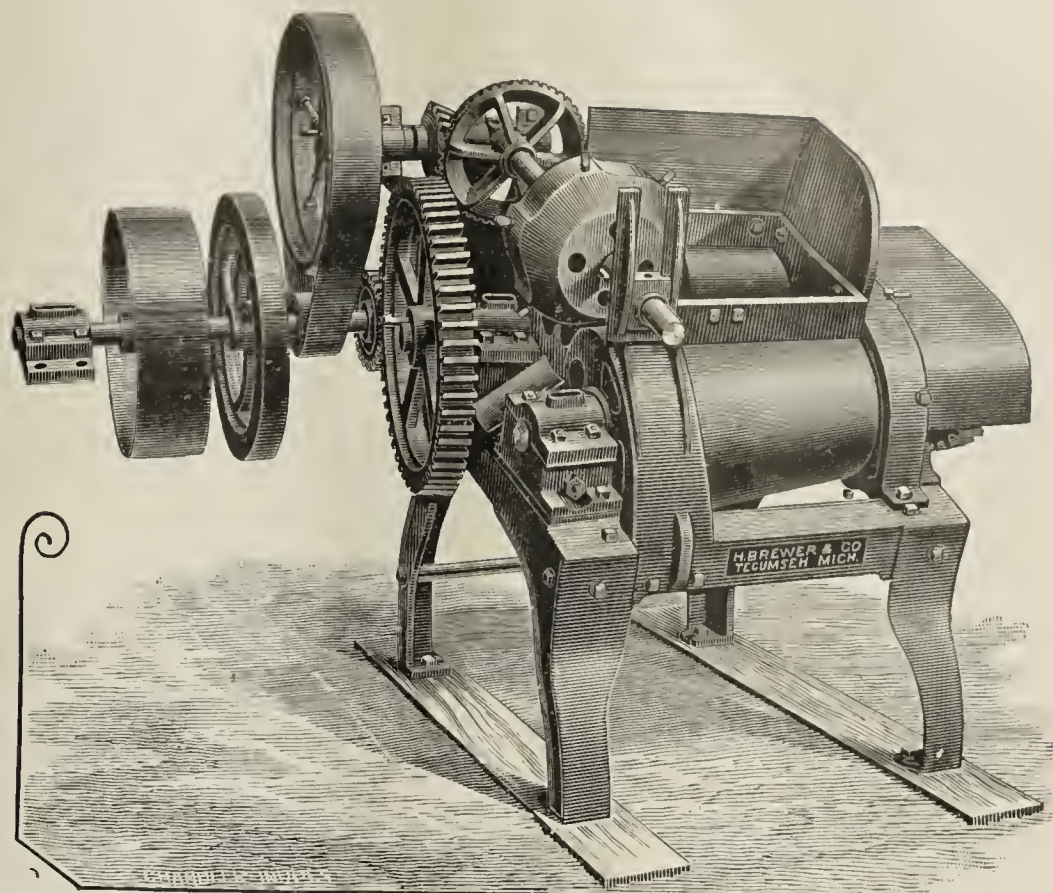
These Machines are
NOT an experiment.

They are used in fifteen
States.

They are a SUCCESS
Investigate them.

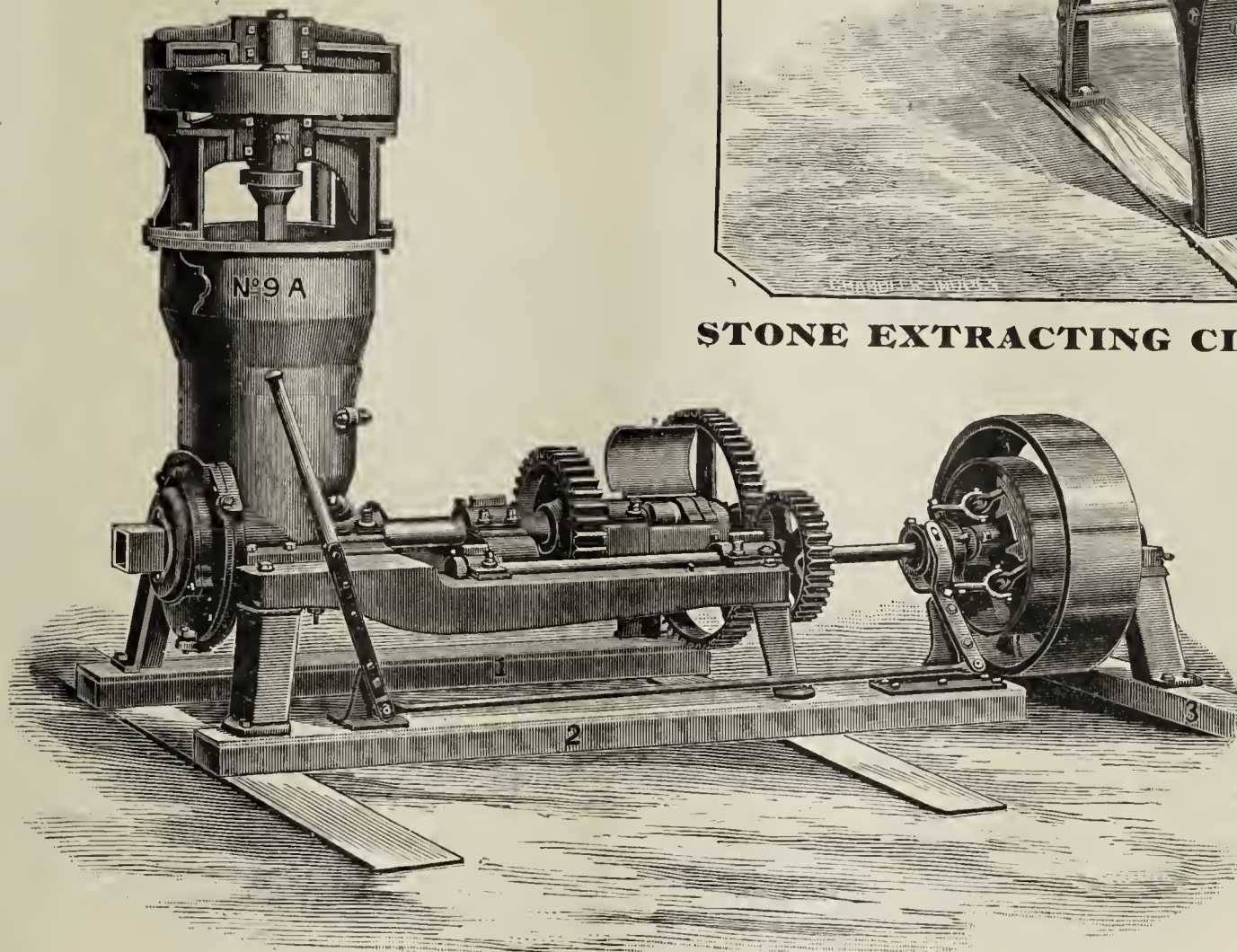
No separate Pug Mill
required.

Clay Working Machinery

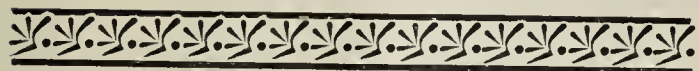


STONE EXTRACTING CLAY CRUSHER.

Complete
Brick
and
Tile
Outfits
a Specialty.



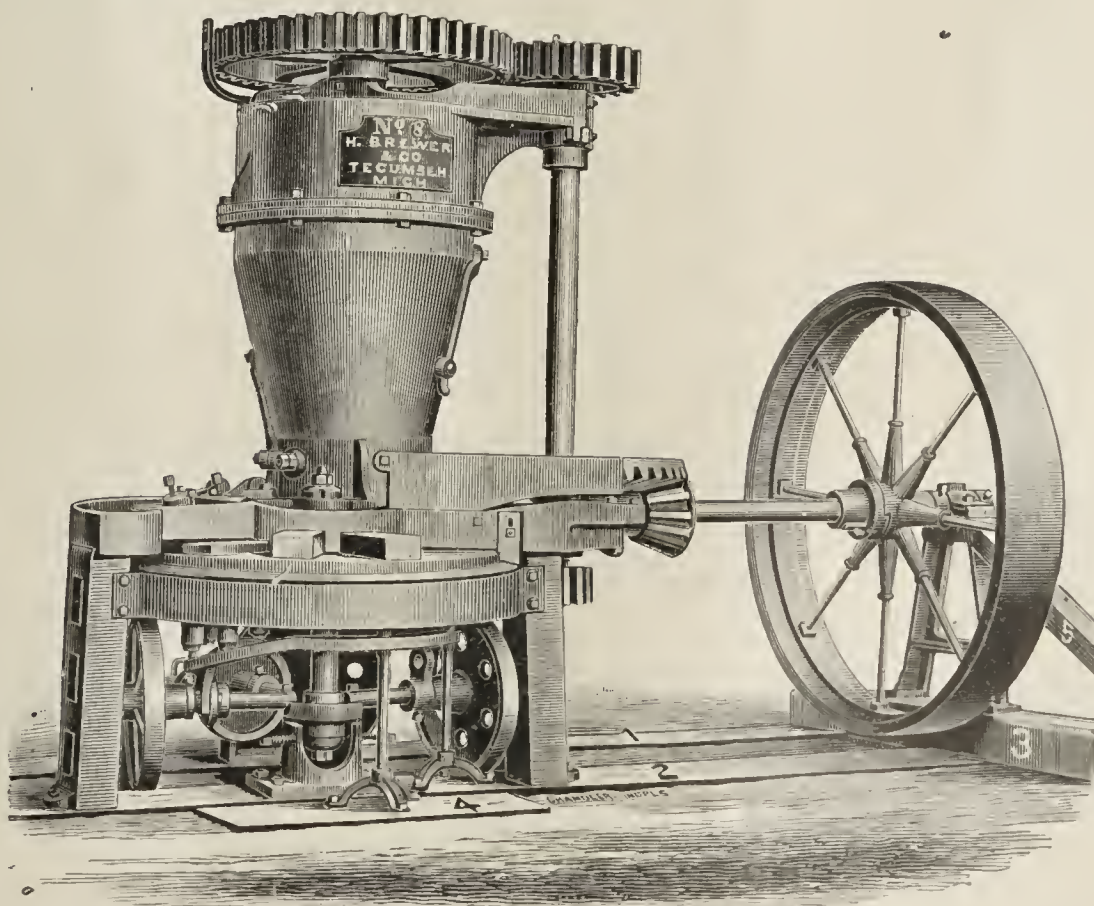
No. 9 "A" BRICK MACHINE.

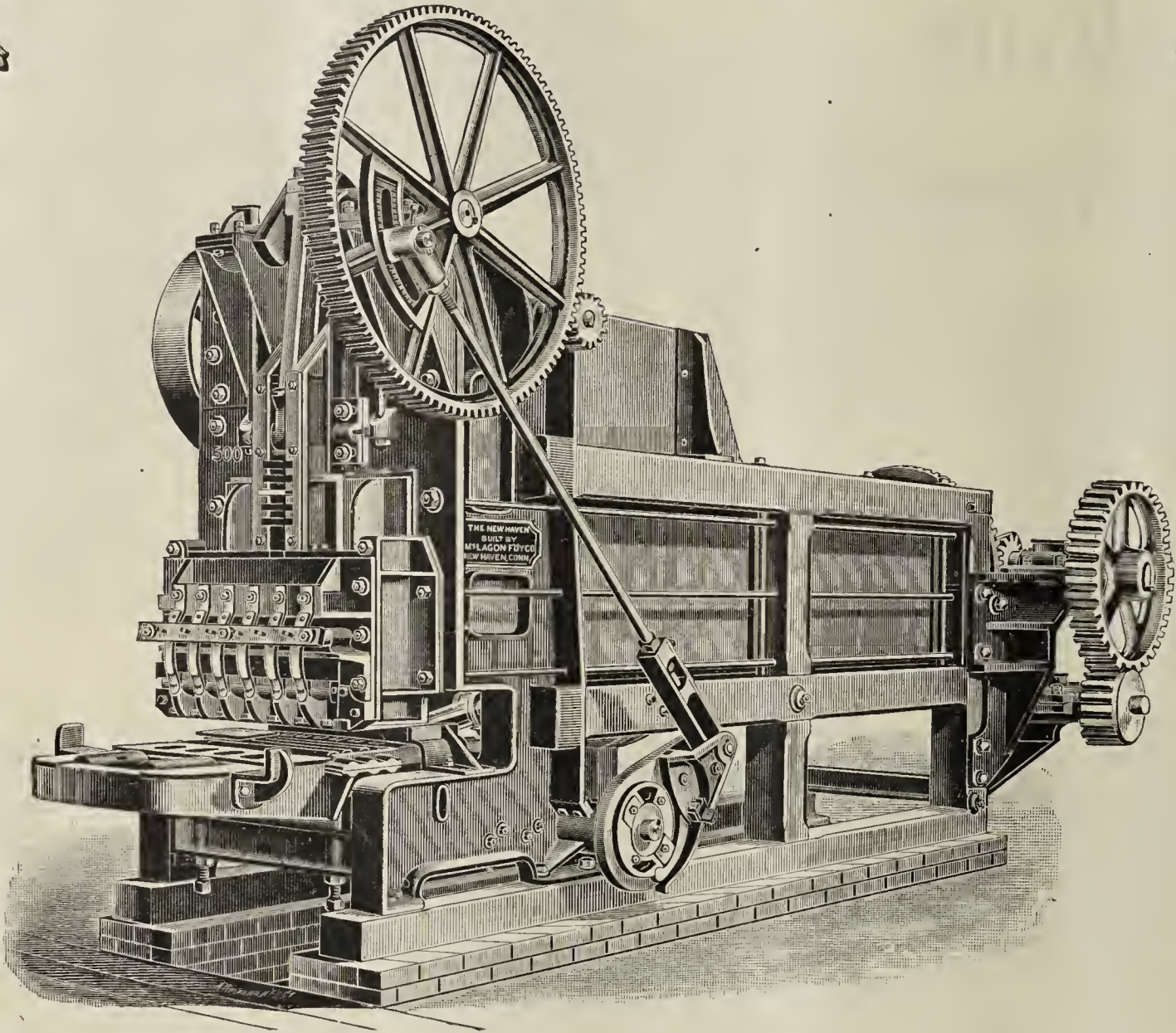


Manufactured by

H. Brewer & Co.,

TECUMSEH,
. . . . MICH.





Value is Proved by Success.

THE FIRST "NEW HAVEN" HORIZONTAL BRICK MACHINE was erected ten years ago, and has been in continuous use seven months in each year since. The average number brick made with it has been **fully one million every month** it has been operated. Notwithstanding this phenomenal production it is good for a like amount of work for many years to come.

Since its advent a large number of these machines have been sold, and all of them have given equally good or better service. **Not one has ever been sold that has failed to give satisfaction.** None have ever been thrown out, or sold second-handed, but all are in successful operation at the present time (excepting one, destroyed by fire). In a number of cases duplicate orders have been received, but **in no instance** has an owner of a "New Haven" Machine placed orders for any other make of soft clay machines. While all this may appear like unseemly boasting, nevertheless it is **an unusual fact**, and shows conclusively its unqualified success.

Continued results determine the economic value of a machine rather than first cost, and on this basis "New Haven" Machines have been proved to be **the least expensive, as well as the greatest profit winners.** That our claims for this are amply substantiated in practice is shown by the testimony of satisfied customers.

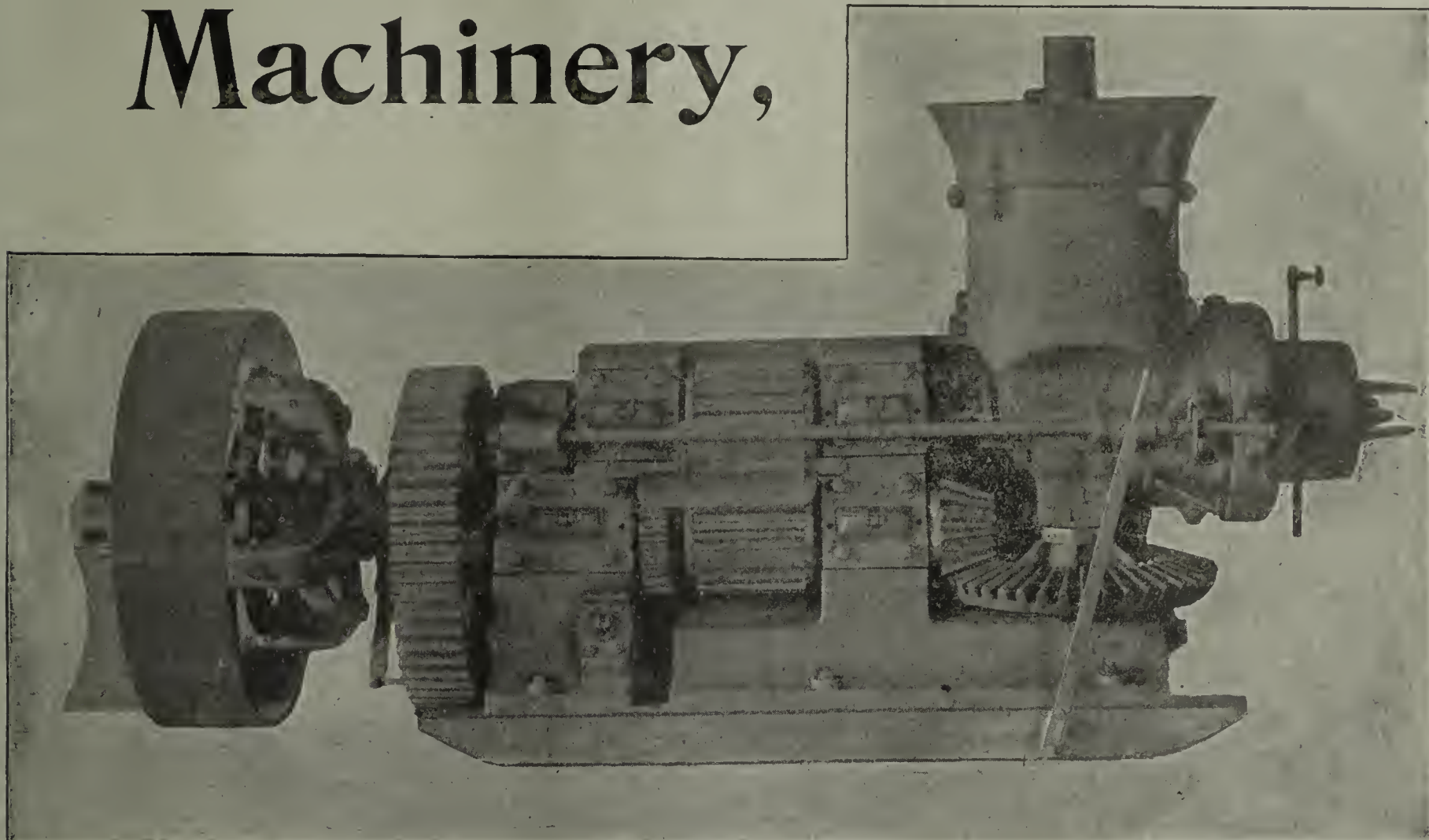
We have a faithful record of every machine from the time it left our works, which has been carefully amended from time to time, and, therefore, know whereof we speak.

The Eastern Machinery Co., NEW HAVEN,
.....CONN.

What's in a Name?

A GREAT DEAL IF A THING BE WELL AND TRULY NAMED AND THIS IS TRUE OF

Wonder Clayworking Machinery,



WHICH is so called because it has proven by actual work in various kinds of clays to have a **Wonderful** capacity, both for quantity and quality. It has a **Wonderful** pugging and tempering capacity and produces a **Wonderfully** strong brick, free from laminations, and in connection with our new automatic cutting table a **Wonderfully** straight, true brick is made of almost any clay. It is this **Wonderful** quality that enables our machinery to work successfully some clays which other auger machines can not work at all satisfactorily. This fact has been demonstrated time and time again. The users of **WONDER MACHINERY** all testify that it is well worthy of the name. They have demonstrated that it has **Wonderful** wearing qualities for which reason it is, in the long run, the best and cheapest machinery on the market.

It will afford us pleasure to send you testimonial letters attesting these facts and quote prices on individual machines or complete plants.

Wallace Manufacturing Co.,

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

Frankfort, Indiana.

Iron Clad Dryer.....IN THE LEAD

All Dry Houses Built in 1898
will be equipped with Important new inventions for reducing cost of drying.

...

Steam
Heat.
Natural
Draft.



Guaranteed To dry soft mud, stiff mud, dry pressed brick and tile, free from white-wash, disintegration or other injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,
Harrison 296.

CHICAGO, ILL.



DETROIT, MICH.

The
Best Brick
Dryer
On Earth

NOTE -

- WE DRY ENOUGH BRICKS ANNUALLY -
- TO BUILD A WALL TEN COURSES -
- HIGH FROM SAN FRANCISCO TO -
- NEW YORK -



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX. No. 3.

INDIANAPOLIS, IND., SEPTEMBER, 1898.

\$2.00 a Year in Advance.

JAMES FLOREY,

MANUFACTURER OF

Repressed, Front and Common Building Brick.

DOWNINGTOWN, PA., July 15th, 1898.

MESSRS CHAMBERS BROS. CO., Philadelphia, Pa.

Gentlemen:—Having just purchased my third Chambers Brick Machine for my yards at East Downingtown, where I first put in your machine four (4) years ago, I wish to say that I can see it pays a brickmaker to use your machines. If I had ignored the difference in first cost and purchased your machine instead of the others I tried when I first commenced to make machine bricks in my Rosemont yard I would have saved several thousand dollars. I can not speak too highly of your machine and its capacity for making bricks.

Yours very truly,

Signed, JAMES FLOREY.

Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

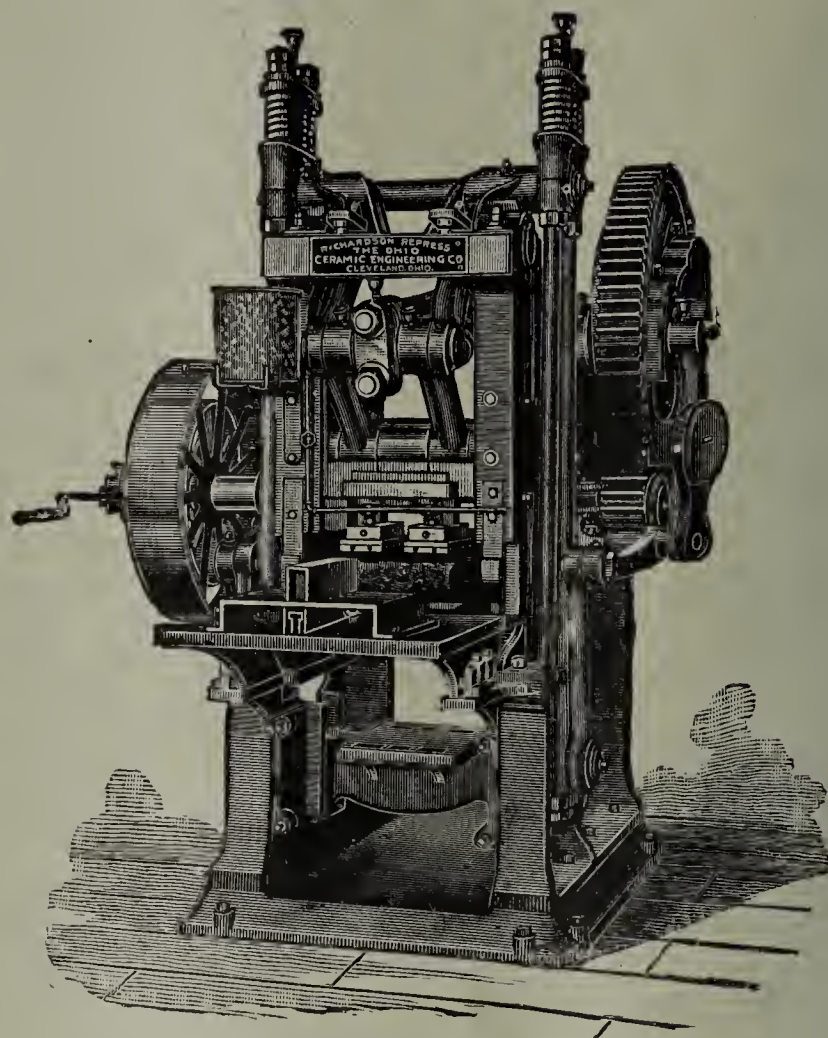
J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

A Brick is
a Brick.

It is either a
good brick, or
good for nothing.

The
RICHARDSON
REPRESS
makes good Brick.



The RICHARDSON REPRESS.

The Ohio Ceramic Engineering Co.
CLEVELAND, OHIO.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
American Clay Working Mach Co., The.....	244	Progress Press Brick and Machine Co.....	..
Chisholm, Boyd & White Co., The	172	Ross-Keller Brick Machine Co. ..	..
Fernholtz Brick Press Co., The.	174	Simpson Brick Press Co	173

Brick and Tile Machinery.

American Clay-Working Mach Co., The.....	244	Horton Mfg Co, The.....	240
Anderson Foundry and Mach. Works.....	242	Huetteman & Cramer Co, The..	238
Baird and Son, H. C.....	226	Kells & Sons	226
Battenfeld-Morgan Co., The....	243	Leader Mfg. Co, The.....	241
Brewer, H. & Co	249	Madden & Co.....	233
Chambers Brothers Co.....	169, 241	Ohio Ceramic Engineering Co., The.....	170
Chicago Brick Machinery Co....	225	Potts & Co., C. & A.....	245
Eastern Machinery Co, The....	250	Raymond & Co., C. W.....	215
Fate & Co., The J. D.....	247	Steele, J. C., & Son.....	235
Freese, E. M. & Co	248	Taplin, Rice & Co.....	239
Henry Martin Brick Mach. Mfg Co, The	228, 238	Wallace Mfg. Co, The.....	223, 251
Hensley, J. W.....	171	Wellington Machine Co, The...	217
		Wiles Co., A. M. & W. H	235
		Woolley Foundry and Machine Works	246

Brick Kilns and Dryers.

Alsip, S. H	234	Morrison & Co., R. B	237
American Blower Co, The.....	252	Martin Dryer Co.....	225
Carson, J. W.....	229	Phillips, S. G.....	227
Eudaly, W. A	237	Pike, E. M.....	229
Fernholtz Brick Press Co, The.	174	Reppell, L. H	234
Haigh, H.....	236	Standard Dry Kiln Co, The....	176
Kaul, C. F.....	229	Swift, F. E.....	219
Lehmann & Co, F.....	236	Wolff Dryer Co.....	252
		Yates, Alfred.....	230

Brick Yard Supplies.

Arnold, D. J. C.....	240	Horton Mfg. Co, The.....	240
Atlas Bolt & Screw Co, The....	230	Jeffrey Manufacturing Co, The.	233
Carlin's Sons, Thomas	230	Marion Steam Shovel Co.....	239
Caldwell & Son Co., H. W.....	231	Mershon & Co., W. B	227
Carmichael, T. W.....	226	Mey, F. H. C.....	230
Carnell, Geo.....	234	Newton, A. H.....	233
Coldewe & Co., G.....	227	Phillips & McLaren	232
Elder & Dunlap.....	228	Pittsburg Mineral Screen Company, The	228
Frost Engine Co	175	Stedman's Machine Works.....	235
Harrington & King Perforating Co, The	171	Williams Patent Crusher and Pulverizer Co	226
Henry Martin Brick Machine Mfg. Co, The.....	228, 238		

Miscellaneous.

Associated Trade & Industrial Press	231	Indianapolis Engraving and Electro Co.....	230, 233
Bennett & Sayer.....	228	Indiana, Deatur & Western ...	232
Big Four R. R.....	231	Illinois Central R. R	230
Cincinnati, Hamilton & Dayton R. R	232	Lake Erie & Western.....	233
Chesapeake & Ohio R. R.....	233	Many, F. B.....	225
Clinton Paving and Building Brick Co., The.....	220	Main Belting Co	231
Coaldale Brick and Tile Co., The	220	McAvoy Vitrified Brick Co	221
Cotton Belt Route.....	233	Monon Route	232
Des Moines Brick Manufacturing Co., The.....	220	Osborne, W. R.....	229
Dean Bros. Steam Pump Works	232	Purinton Paving Brick Co, The	221
Dover Fire Brick Co.....	231	Rockwood Mfg. Co, The.....	232
Evens & Howard	227	Rochester Optical Co.....	229
Gabriel & Schall.....	228	St. Louis Terra Cotta Co.....	228
Geysbeek, S.....	232	Tennille, A. F.....	228
Hay & Willits Mfg. Co	242	Vandalia Line	231
Indiana Bermudez Asphalt Co.	220	VanDuzen Co, The E. W.....	232
Indianapolis College of Law ...	229	Wabash Railroad.....	231
		Small Ads., Wanted, For Sale, etc.	

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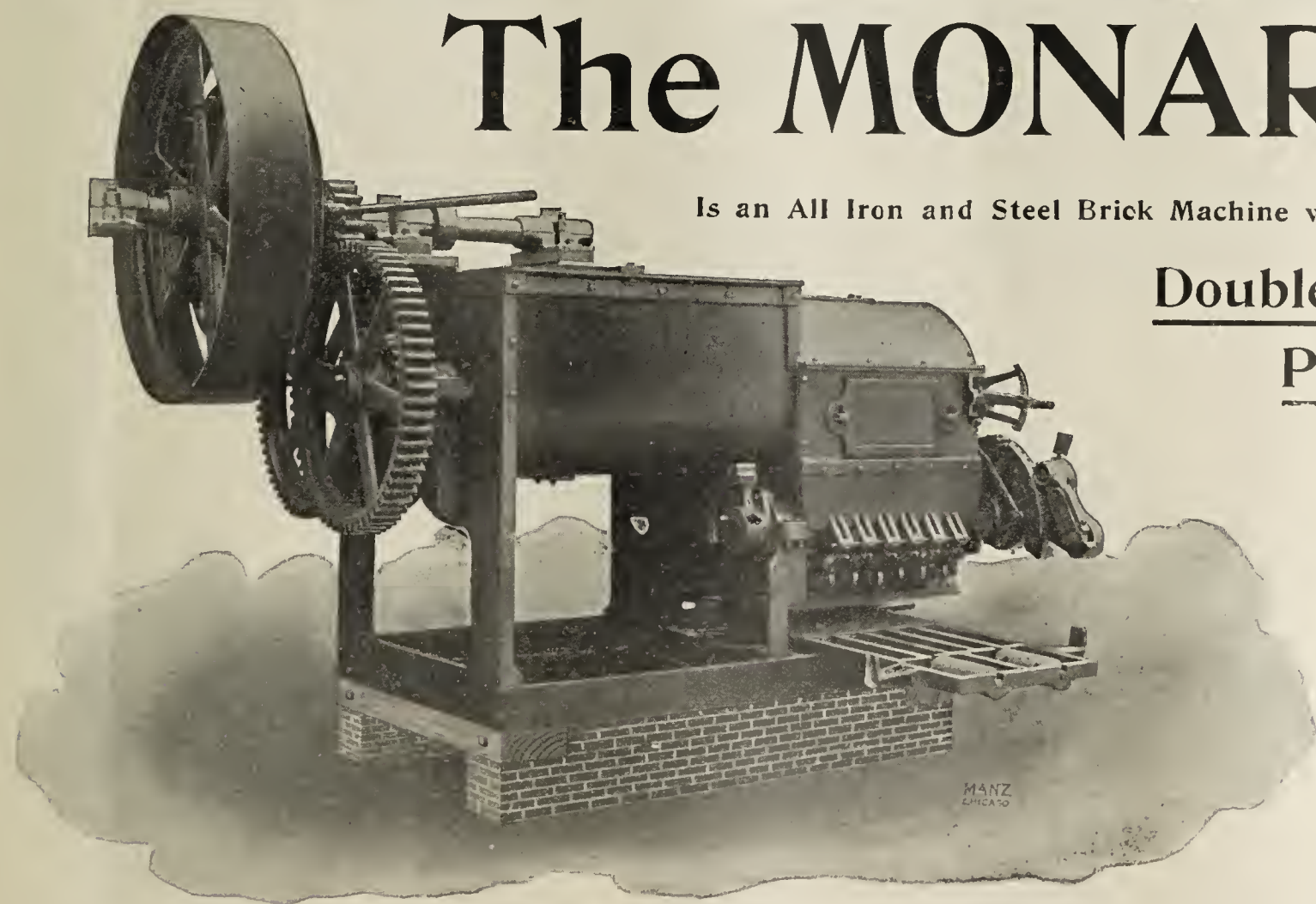
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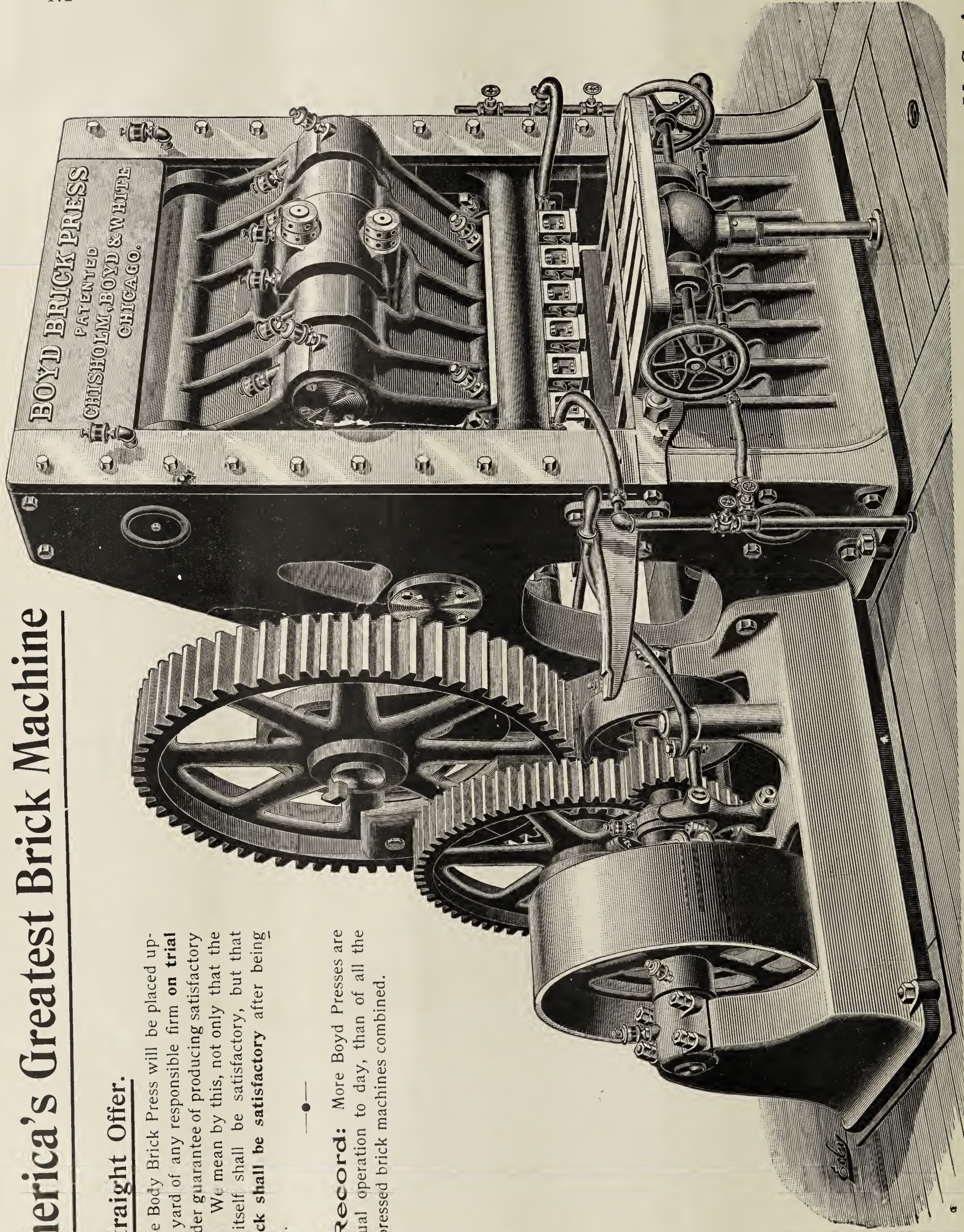
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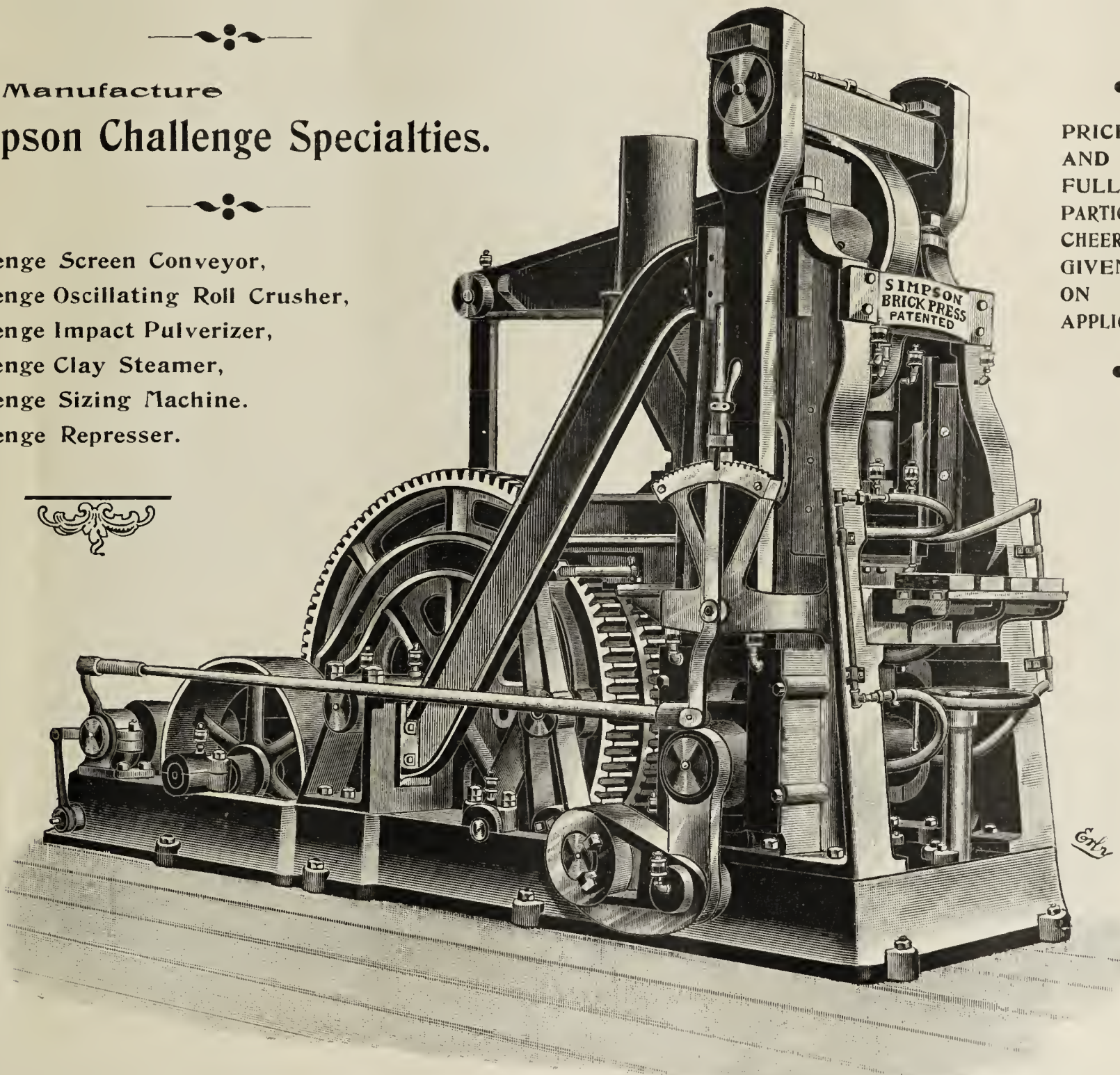
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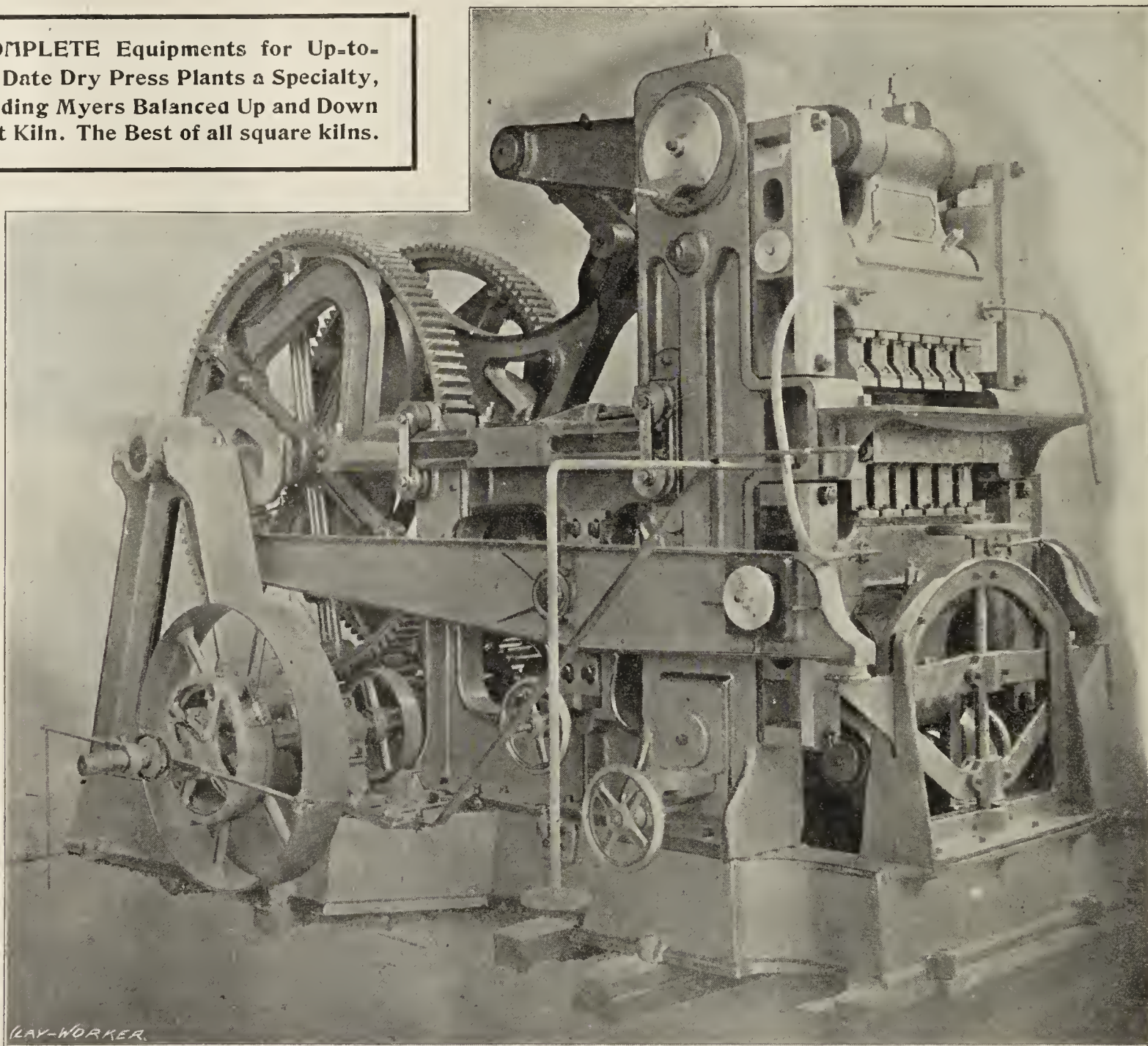
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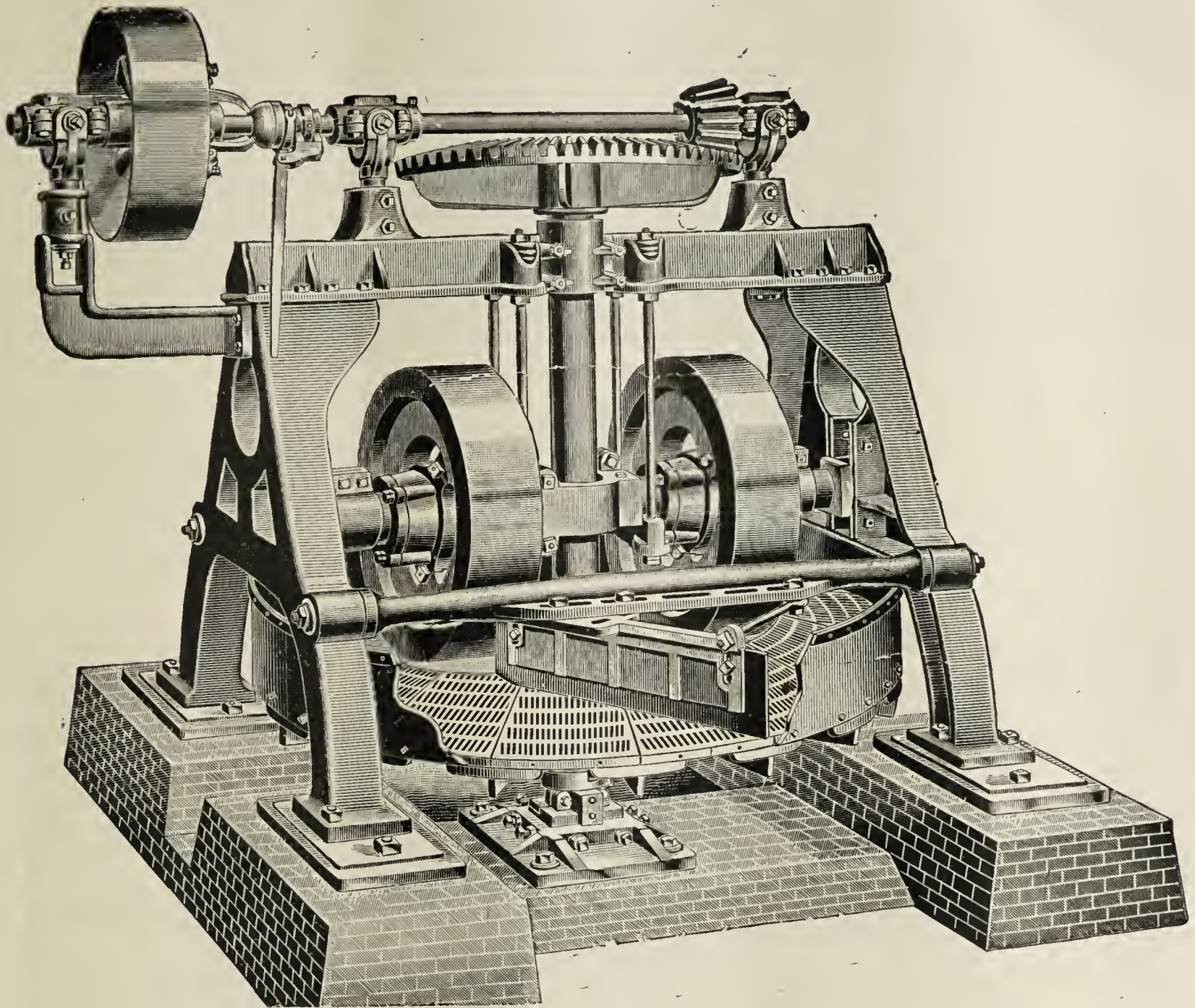
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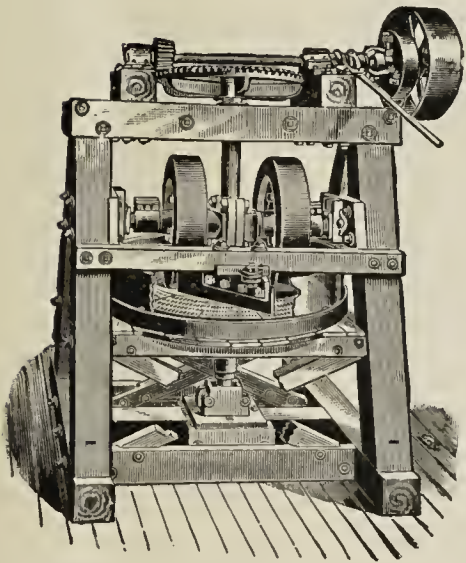
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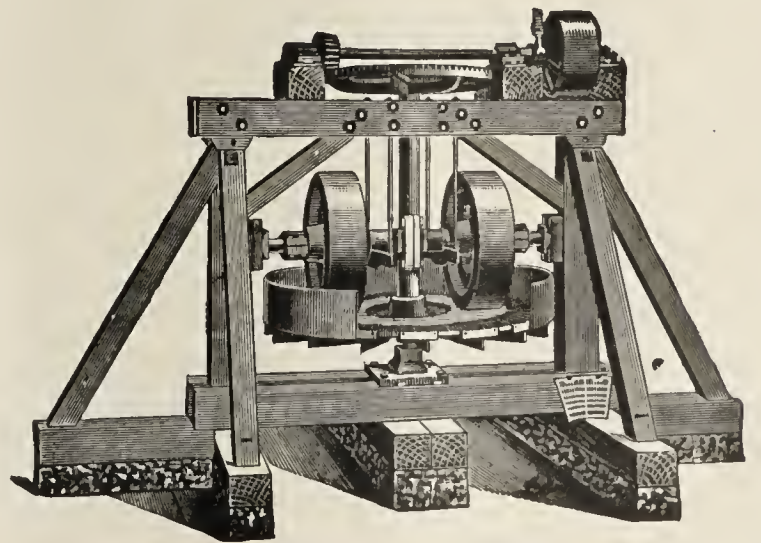
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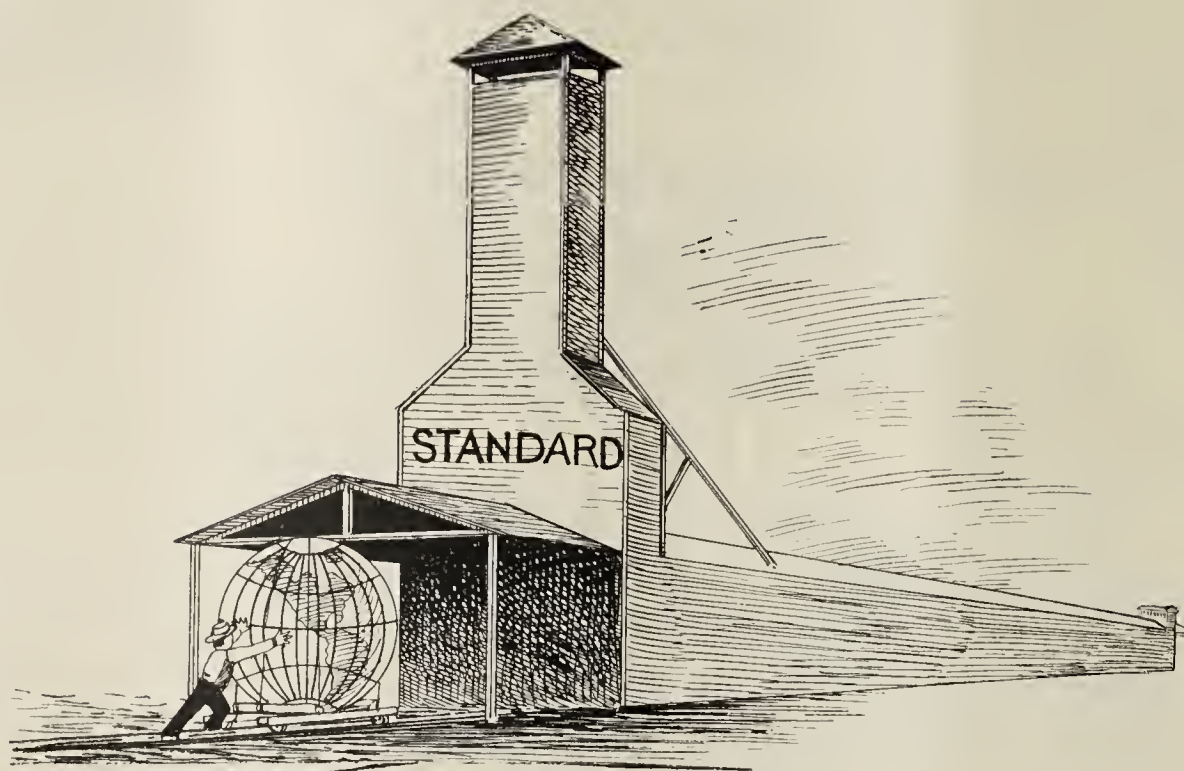
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186 South Meridian Street.

INDIANAPOLIS, IND.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX.

INDIANAPOLIS, IND., SEPTEMBER, 1898.

No. 3.

Written for the CLAY-WORKER.

CLAY IN ARCHITECTURE.

A Successful Handling of a Difficult Subject.

THE ACCOMPANYING photograph of a combined store and residence, built entirely of clay products is a very successful treatment of the conventional mansard front in an artistic spirit. The time-worn black slate mansard front has become so monotonous from incessant repetition, that it is refreshing to see such a radical and successful departure as the architect has secured in a subject that was rendered especially difficult of artistic handling by the store which occupies the first floor.

Yet a successful arrangement of details, the grouping of appropriate designs, and a highly artistic color scheme, has enabled the architect, Mr. A. M. Beineke, of St. Louis, to secure a pleasing, dignified attractive commercial residence on a narrow lot, and at a very moderate cost. White terra cotta surrounds the store, to off-set the greens and bright colors of the flowers, roman

buff brick relieved by white terra cotta trimmings is used on the second story, while the mansard is most successfully handled by a dark red Standard tile roof, with an attractive hipped dormer window to break the lines. It is thus by successfully combining color with design that a warm, attractive, artistic result is secured. American architects have been too conservative in taking advantage of color in their work—a feature that is the sole motive in some schools of art, and no material is more suitable than clay in securing delicacy, warmth and variety of color.

H. A. W.

One of the most essential functions of architecture is expression, and all architecture should be, as far as possible, expressive of two things—its purpose and its construction. The question of purpose affects the general design of a building; the question of construction affects the special uses of the several materials composing it, and terra cotta really demands a special treatment at the hands of architects in order to produce the most satisfactory results. The uses to which terra cotta can, with more or less propriety be applied are so many and so various that it is somewhat difficult to define where its application should commence and where it should cease.

JOINER.



AN ALL CLAY STORE AND RESIDENCE OF BUFF BRICK, WHITE TERRA COTTA TRIMMINGS AND RED STANDARD TILE ROOF. Aug. M. Beineke, Architect, St. Louis.

Written for the CLAY-WORKER.

HINTS ON BRICKMAKING.

BY R. B. MORRISON.



AS BRICK HAD BEEN MOLDED by hand for thousands of years, it was natural that the first machines for molding brick should be designed to mold soft clay. The first of these machines were rude in their mechanism. Clay was ground by horse-power, and pressed into the mold and delivered on the table by hand-power. The principles upon which these machines were constructed was practically the same as in the steam-power machines of to-day. Clay was forced into the mud box by the grinding apparatus, a plunger descended, forcing the soft clay through a slotted casting into the molds, the slots corresponding in number with the bricks in the mold, and being directly over them. The modern machine uses the same device with many improvements.

About thirty years ago these machines began to force their way into the brick plants. There was strong prejudice against them among practical brickmakers. There had been several machines invented and used prior to this date, but steam-power had not been utilized in their operation.

These machines were imperfect in their parts, and lacked strength to withstand the strain put upon them. When pressing clay into the molds, breakage was frequent and cost of repairs and loss of time was a serious matter to the proprietor. Bricks pressed into the molds came forth with imperfect corners. The pressure being greater in the middle than at the ends of the brick, caused the brick to adhere to the molds and be imperfect in shape. All these defects were remedied. Many valuable suggestions came from the brickmaker that helped the machine manufacturer to improve his invention. It was found that burning the sand used to coat the mold caused the brick to slip quicker from the molds. The pallet system also obviated much of this difficulty. When brick were carried to the yard in the molds, at least twenty molds were used. With the pallet system, only five. The brick in the mold moistened the sand, if they remained a short time in the mold, which caused the brick to adhere to the mold. While with the pallet system they were dumped at the machine, and this kept the molds damp so they could retain a coat of the sand. Without this system the soft-clay machine would not be so popular as it is now.

In many parts of the country soft-clay machines are used almost exclusively. This is especially true of New England. The consumer has much to do with this, and the quality of clay also enters into the question. When first introduced, machines required clay tempered softer than for hand molding, on account of lack of strength to resist strain of grinding and pressing. Now these machines are built so strong that they will mold clay so stiff that a hand molder could not work it.

Again, the machines will now mold clay so tough and tenacious that a hand molder could not mold it at all. The soft-clay machine was the pioneer, and, like the true pioneer, it has come to stay, and is recognized among brickmakers as a practical success. It makes stronger brick, better in shape and finish, than can be made by hand. One steam-power machine can do the work of six molders, and do it better. It relieves man of one of the hardest muscular tasks that has ever fallen to his lot, and labor should bid it welcome. The men who have brought these machines to their present state of practicability deserve credit. The way was long and weary, and the pathway paved with stones and old iron.

In reference to the merits of soft-clay brick in comparison with plastic and semi-dry: The soft-clay process will produce a good brick from some clays that cannot be successfully

worked by any other process. Sandy or porous clays give better results by this process. While plastic clay, as a rule, makes a stronger brick, yet the soft-clay brick will resist frost better. I mean by this that you may burn the two together, and the soft mud brick will stand frost while the other will scale. The plastic must be burned harder to stand as well as the soft-clay brick. The sand surface of a soft clay is considered by some architects preferable to a smooth surface in facing a wall.

There is, however, abundance of room for all these processes. Each has its place in the economy of our craft. The brick-maker must consider the prejudices of his customers, quality of his clay, etc., before determining the kind of machine he will adopt. Should he decide to manufacture soft-clay brick, he need have no fears that he will not be able to secure a machine that will give him satisfaction from the many standard machines made by manufacturers of soft-clay machines.

In another article plastic-clay machines will be discussed.

THE CLAYS AND CLAY INDUSTRIES OF NORTH-WESTERN INDIANA.

BY W. S. BLATCHLEY.

THE LOCATION and leading surface features of Lake and Porter counties are given in another paper, hence they are not treated here in this connection. The clays of the county which come close enough to the surface for utilization are of two kinds, drift clays and silty or marly clays. The drift clays are utilized at Lowell and Crown Point in the making of brick and drain tile, and the silty clays, at Hobart, on an extensive scale, in the making of terra cotta lumber, flue lining, fire-proofing and ordinary and pressed front brick.

At Lowell the clay factory has been operated by P. D. Clark for 12 years. The amount invested is but \$5,000 and the value of the annual output is about the same, equally divided between the two products. The clay used is gotten from a hillside northwest of the town, northwest quarter of section 23 (33 north, 9 west). It is a tough yellowish drift clay about 12 feet in thickness, with many small pebbles of lime carbonate and other material scattered through the basal portion. For this reason only the upper four or five feet are used and this has to be passed through a crusher. Underlying the clay stratum is a thick deposit of coarse sand.

The plant is located at the base of the hill and the clay is hauled to it in carts. After being crushed it is passed through a perpendicular pug mill and then through a "Little Wonder" brick and tile machine. The products are dried by air in sheds and burned in round down-draft kilns. Aside from an occasional pebble, which escapes the crusher, and causes a flaking of the surface, the brick and tile are of good quality. The clay, however, is not suited for higher grade products.

Drift clay similar to that used at Lowell lies near the surface over an area about three miles wide between Lowell and Crown Point. At the latter place H. W. Wise has been making brick from it for 24 years and has lately begun the making of tile. Only about three feet of the clay can be used on account of the pebbles in the lower portion of the bed. A Penfield brick and tile machine is used and the value of the annual output is about \$2,500.

By the side of the Pittsburgh, Fort Wayne & Chicago Railway, just north of Hobart, in the southwest quarter of section 29, and the southeast quarter of section 30 (36 north, 7 west), is one of the largest, best known and most valuable deposits of silty clay in northwestern Indiana. For a long period ordinary soft mud brick were made in large numbers from the surface portion of this deposit, but in April, 1887, W. B. Owen began the making of terra cotta lumber and fire-proof products from the deeper portions of the clay bed, and this business, now carried on under the name of "The Hobart Terra Cotta

Lumber Company," has become one of the most important clay industries in the State. The pit at the Owen yard covers an area of about four acres and is 25 feet deep. A section of it showed as follows:

1. Soil.....6 inches.
2. Fine grained yellowish marly clay...2½ to 3 feet.
3. Grayish-blue, exceed'ly fine grai'd...21 feet.

The two clays, Nos. 2 and 3, were, when deposited, doubtless of the same color, and the difference in hue now existing has been caused by leaching waters. No. 3 has been pierced by a bore to a depth of 132 feet without reaching its base. The deposit is a well-defined silt, the upper six to ten feet of blue clay being in layers two to six inches thick, with each layer separated from the one above and below by a thin coating of sand. Towards the bottom of the exposure the layers become thicker, eight to fourteen inches, and the clay is more condensed and contains less free silica. Not a pebble or solid body of any size occurs in the entire deposit, and it was most probably laid down by slow deposition in the waters of a shal-

Potash	3.74
Soda	.70
Fluxes	22.67
Carbon dioxide.....	9.62
Total	99.72.

The large percentage of the fluxes present shows that wares from this clay cannot be subjected to great heat on account of the danger of their melting down. The clay is peculiarly fitted for a light, porous product, which does not require the properties of hardness or toughness.

In the making of the terra cotta lumber and other fire-proof products, the clay is excavated with spades and elevated in tram-cars as fast as needed to the upper floor of the plant, where it is dumped by the side of an opening leading to a perpendicular pug mill. From the opposite side of the building a belt carrier elevates screened sawdust and drops it near the same point. The clay is moistened by sprinkling water over



Clay Pit of Hobart Terra Cotta Lumber Company, Hobart, Indiana.

low bay which formed an adjunct to the highest stage of the old glacial Lake Chicago.

When dry the clay becomes much lighter in color. By itself it burns to a dark cream, and, when mixed with the surface stratum, to a light pinkish hue. On account of the presence of about 20 per cent. of calcium and magnesium carbonates, the clay effervesces freely with acids. Its chemical composition, as determined by Noyes, is as follows:

—Analysis of Marly Clay from Hobart, Ind.—

	Per Cent.
Silica	50.56
Titanium oxide.....	1.00
Alumina.....	13.11
Combined water.....	2.76
Clay base and sand.....	67.43
Feric oxide.....	2.98
Ferrous oxide.....	2.32
Lime	7.87
Magnesia	5.06

it with a hose, and two men scoop alternate shovelfuls of clay and sawdust into the pug mill. In it the two are thoroughly mixed and then passed into a horizontal brick machine, from which the mixture emerges as a cylindrical roll eight inches in diameter. This is cut into blocks 14 inches long which are elevated to the top of a Vaughn & Taylor sewer-pipe press fitted with dies of the proper size and pattern for the product desired. As fast as taken from the press the wares are placed on double-deck iron cars, 280 of which are in use, and dried by steam in tunnel dryers. The kilns in which it is burned are ten in number, rectangular down-draft, each one holding 10,000 feet of six-inch partition. The output of the plant averages 60 tons a day of the finished product, and the drying and burning capacity is sufficient to take care of this amount. About nine days are required from the time the clay is taken from the pit until the finished material is ready to load on the cars. Sixty carloads a month are shipped to all parts of the United States; the value of the annual output being from

\$60,000 to \$75,000. The products of this plant consist of wall partition or fire-proofing, from seven-eighths to twelve inches in thickness; floor arching, wall furring, column and girder covering, under-roofing to which slate or roofing tile can be nailed, and everything in the clay line that goes inside the walls of a fire-proof building. For the porous wall partition the following points of advantage are claimed:

1. It is a non-conductor of heat, cold and sound.
2. One coat of plaster, without studding or lath, finishes the partition.
3. It can be shaped with edge tools and holds nails and screws.
4. It can be put in place more rapidly and at less cost than brick.
5. Its cost to the consumer is only slightly greater than wood.

But three factories are at present making this porous partition in the States of Illinois and Indiana; one located at Pullman, Illinois, one (described in the present paper) at Brook, Indiana, and the one at Hobart. The demand is constantly increasing and the factory at Hobart made no stop during the panic of 1893-95.

Written for the CLAY-WORKER.

A TOUR OF SCOTLAND.

—The Clayworkers' Art in the Land o' Cakes.—



O LAND ON EARTH, perhaps, is so enticing to the weary office man, so recreating to the convalescent man, so rich to the romantic pleasure-seeker, and so uninviting to the mercenary clayworker, as the land where Bruce and Wallace fought and bled, and which Burns and Scott have made famous in song and prose.

After a long and weary voyage across the Atlantic through fog and storm, land of whatever sort is welcome to the eye of the traveler. The rough and rugged coasts of Northern Ireland are artistically beautiful in their scant patches of emerald green. Nature has surely done for that northern clime what civilization even has not done for the South. But, beautiful and inviting as the Irish shores are, there lies a little to the east of them a land far more charming to the lovers of nature. The scenery of the Firth of Clyde has been well described as "the most exquisite panorama to be found on a hundred rivers or in a hundred lands." At every nook and turn something new with a hue of its own meets the eye to charm and engage. The rough coast of Argyleshire and the Kyles of Bute, with the many miles of shore before and after them, are one continuous panorama. The Hudson may be inviting to the New Yorker, the St. Lawrence marvelous to the Western traveler, but the Clyde, insignificant in size when compared to these two, is the admiration of all.

The ship yards, among the largest in the world, are well worth sailing the Clyde to see. The largest of all dry docks may be found there. The world owes a debt of gratitude to this little Scotch river. The Scotch ship-builders are among the best, and every nation has drawn from their workshops.

One hardly likes to turn his mind away from this superb scenery to the Scotch people. They are a study in themselves, and one finds himself contemplating them, rather than his surroundings. There is a sameness, of course, about any one people, so when one speaks of one locality the same characteristics may be applied, more or less generally, to the whole people. An American's first impression of the Scotch folks is, that they take time to do their work. Their creed is, "What we cannot do comfortably to-day we leave for to-morrow." "More haste, the worse speed," seems to be a well-established maxim

among them. The apparent indifference to their surroundings shows their meditative turn of mind. It is rather amusing, but at the same time vexing, to be riding along the road, ringing your bicycle bell as hard as you can, only to find that the Scotch ear has no regard for metallic sound. I have often been tempted to change the old proverb to read, "Nothing is so deaf as a Scotchman."

An American is strangely chagrined, on making his first tour by road, to discover that he must turn to the left, instead of the right, as is the American custom. I cannot refrain from relating an incident which happened one day near Stirling. A funeral procession was moving very orderly along the road, consisting, of course, entirely of men too much concerned with the "occasion" to be moved by the clanging of bells. The right side of the road for passing being monopolized by the procession, I quietly turned in the opposite direction, and, to my surprise, two Scotchmen actually became excited, and swore at me like two impetuous Irishmen. Of course, there is a jovial side to the Scotch people. You touch the flexible part when you talk to him of his national heroes. Talk of Wallace and Bruce, of Scott and Burns, and the Scotchman at once becomes doubly hospitable. He knows not only his local history, tradition and legend, but the details almost, of the long borderland warfare.

But more of the mercenary. I have often thought that the natural conditions of a country exert an immeasurable influence on the character of the people. Having come from ancestors of a warlike turn of mind, accustomed to fortify themselves with massive stone structures, the people themselves have naturally turned to this same material for home building. Whatever route one takes from Glasgow on the west to Edinburgh on the east, he finds a constant sameness in the buildings—stone everywhere. If I may speak of Glasgow itself, I spent a day or two there, going over a great deal of the city, and the only brick structure worth mentioning is a factory chimney. It is, or was, so the Scotch say, the highest in the world, measuring over 400 feet. I was unfortunate, per force, not to get a photograph of it. Most factory chimneys are, of course, made of brick, though I have seen some of stone. In two or three other cases I saw small brick buildings, but, as my memory served me, when I left I had seen only one row of brick cottages.

In riding by road a distance of three hundred miles, I saw only three or four little "one-horse" brickyards. Clay, there is plenty, and the supply equals the demand. What is needed is to create a demand. Brick, it is true, could never make the better parts of Edinburgh what stone has made them, but their use in the erection of tenement houses would wonderfully improve the conditions of the poor. The Scotch seem to have a tenacity for stone. I have been in some parts where brick are beginning to be used, a four-inch facing of stone to give a Scotch appearance. A very noticeable feature of Scotch cities and town is the red or gray clay chimney pots. Many, perhaps nearly all of them, I am told, are made in England.

My journeyings did not take me very far north in Scotland—covering only eight shires—but I am told that the same characteristics prevail. When one crosses the borderland he sees at once a decided difference in the character of both persons and things. They are not so measured and precise. I have seen in Scotland road distances measured to the yard and foot, e. g., 9 miles, 64 yards and two feet to —. The Englishman is satisfied to leave out the fraction of a yard, and we Americans, of course, are not partial to a few miles. The borderland clay industry, especially on the English side, while not extensive, is growing quite fast. With few exceptions, all cottages and tenement houses are built of brick. But enough for the present. At my next writing I hope to give you some more definite ideas of the work in clay in Cumberland and Northumberland.

THOMAS JENKINS.

Written for the CLAY-WORKER.

SOCIAL BRICKMAKERS.



NEW ENGLAND Stove Lining Association held their annual clam-bake dinner at Dighton, Mass., on Wednesday, August 31, at which they partook of one of the very best shore dinners ever served by their veteran caterer, Gideon Francis.

With his usual kindly forethought the genial secretary, B. C. Peirce, sent an invitation to the writer, who, with his constant ability to enjoy good things, did not fail to be present, accompanied by our friend, C. A. Bloomfield, of New York, and we are able to testify that upon this occasion our old friend, Gideon Francis, excelled all his previous efforts in feasting his fellow brickmakers and their guests.

The gathering, although numerous, was not so large as it has been heretofore, owing to an unfortunate conflict in dates, some of the local associations in the State of Pennsylvania having meetings upon the same day, and brickmakers, like all successful men, always attend to the matter nearest to hand.

The true and practical association is built up upon the faithful performance of duty in the individual yard and district.

The meeting this year was assembled at the works of the Dighton Stove Lining Company, which are pleasantly situated upon the shore of the Taunton river, midway between Fall River and Taunton, Mass.

The weather was all that could be desired, the sunshine was tempered by fleecy clouds, which made an occasional canopy that, together with the cooling breezes constantly wafted from the bay and river, prevented any distress from the heat.

As is the custom, part of the morning was spent in examining the Stove Lining and Fire-Brick Works. This is a very

uniform in texture of body. They, with calculation and judgment, set the ware in the kiln so as to avoid warping or unequal draft in the burning. Then they so control the process of burning that every brick, top to bottom, side or center, is of an equal color, shrinkage and shape. Quality does rule the market. It may not always receive its due reward, but it will always receive recognition and some share of recompense.

No business of special importance was transacted at this meeting, the protracted spell of torrid weather disposing everyone to enjoy a season of rest and general conversation. The informal character of the business meeting may be judged from the picture which we give of the assembly in front of the office of the Dighton works. The topics of conversation in most



Gathered Round the Festive Board.

part related to the retrospective and perspective condition of the Stove Lining industry, mingled with some timely and kindly references to those who were absent, some of whom have gone over the silent river, and will never again, with welcome greeting or useful counsel or kindly joke, assist at these well-appreciated annual reunions of the New England Stove Lining Association.

JAMES TAYLOR.

RELATIVE VALUE OF COAL AND WOOD AS FUEL.

STRANGE AS IT MAY APPEAR to those who have never lived outside large cities, where a big price must be paid for a little wood for kindling purposes, there are still many localities in this and other countries where wood is the cheapest fuel to be had. Gradually, in many of these places, this is being reversed, and coal becomes cheaper than wood, but it will be many years before it is universally reversed, if that time should ever come.

As might be expected, the question of whether it would be advisable to change from one kind of fuel to the other is sometimes puzzling, but can generally be determined from a consideration of the comparative value of the different kinds of wood for steam making. The relative values of coal and different kinds of wood for this purpose is about as follows, the coal being of a fairly good quality:

One cord of hickory or maple wood is equal to 1,800 pounds of coal; one cord of white oak is equal to 1,550 pounds of coal; one cord of beech is equal to 1,300 pounds of coal; one cord of chestnut is equal to 950 pounds of coal. Red or black oak is about equal to beech, and elm and poplar to chestnut.

To make a comparison, say the wood obtainable is beech and oak. One cord of wood is equal to 1,300 pounds of coal. Then, 2,000 divided by 1,300 equals 1.54; one net ton of coal is equal to 1½ cords of wood. Say coal in the locality is worth



Sec'y B. C. Peirce and family off for the Annual Clam Bake—The Dighton Stove Lining Works in the Back Ground.

necessary obligation, for Superintendent Francis is always awake, and is apt to smuggle in some new improvement and get ahead. "The very best we can make is none to good" is his motto.

Everything was found up-to-date, and in keeping with the manager's reputation. Order and cleanliness are the rule in all the departments, and it is not surprising that here we saw a stock of fire clay work which we believe is hard to beat in regard to color, finish and texture.

One maxim the intelligent brickmaker may learn by a visit to these works, viz., that skill and exactness are worth more than quantity and carelessness.

Here they carefully prepare the clay, so that the product is

\$4 per net ton. Then 4, divided by 1.54, equals 2.59. Coal at \$4 per net ton and wood at \$2.59 per cord would be on terms of equality.

Pound for pound, one kind of wood is about as valuable as another, $2\frac{1}{4}$ pounds of dry wood being equal to one pound of coal.

When wood is used for fuel it should be thoroughly dry. There is a very material loss in burning wet wood. There is also some loss in burning wet coal, but it is only trifling compared with the loss from burning wet wood.—Tradesman.

Written for the CLAY-WORKER.

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Fifteenth Paper.

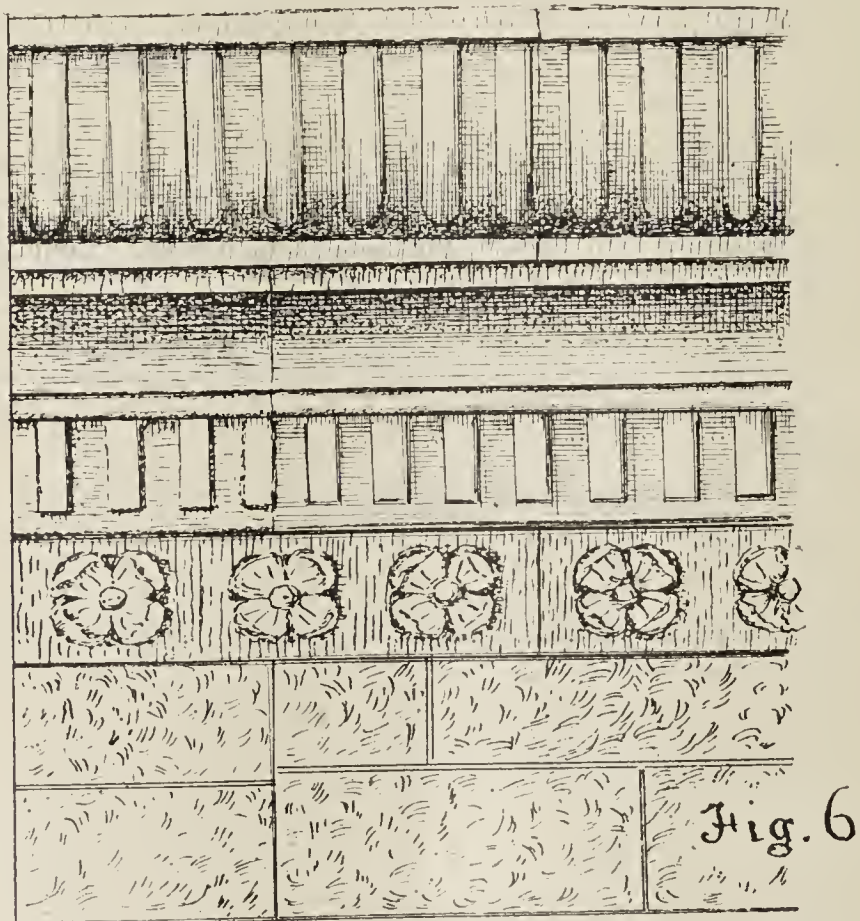
BY E. G. DURANT.



HAVING IN THE LAST paper referred to new methods employed in the manufacture of roofing tile by introducing the hollow block roller die process, it remains to be shown that other new and important features may be introduced which shall serve as a connecting link between wall and roof, and which may be expected, because a need exists which may be happily met, to open up a new and important field for the use of clay w res.

The statement will not be challenged, that no portion of the exterior finish of a building has more to do with determining its general character, or with its acceptance by people of good taste, than the cornice, which in this presentation shall be considered as including all that intervenes between the wall proper and the roof covering.

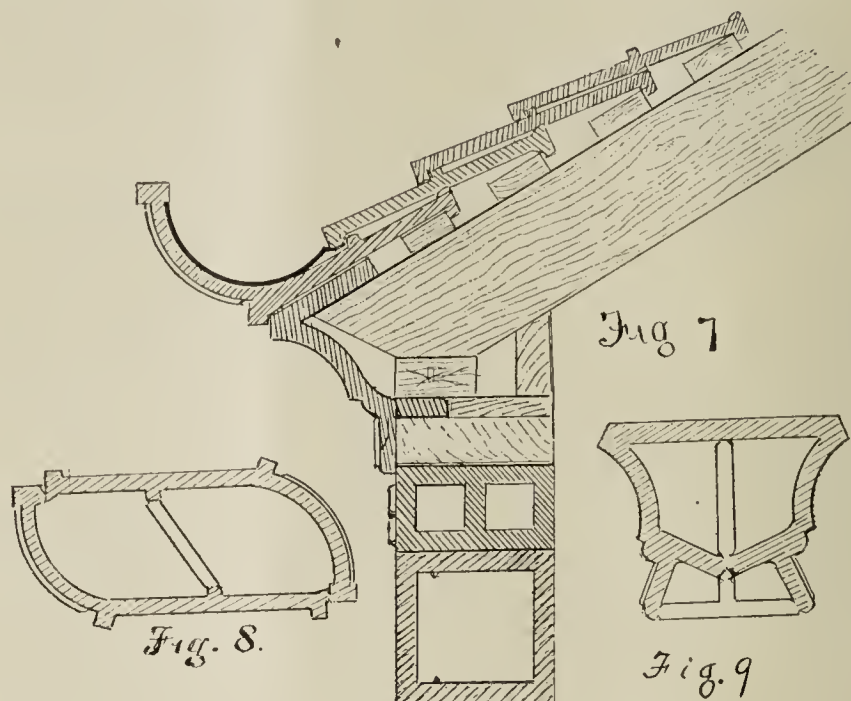
It is generally recognized that this is one of the most prominent danger points in a time of conflagration, and this may be said to be especially true as roofs are at present constructed, with the rakish overhang which characterizes the accepted style of roof and cornice treatment, more noticeable, of course, in isolated dwellings and in public buildings, which standing



alone both permit of and demand bolder roof treatment than is required or accorded to the integral parts of blocks of buildings in closely built sections. It will be seen, however, that the terra cotta finish now proposed will permit of a very general use, as it can be easily modified to meet almost any require-

ments, and need not be excluded in some form from any buildings of masonry because of attendant costs.

We think we can see why such cornice material should be given a cordial reception by those who build or plan buildings.



to be constructed of brick, and who have heretofore been obliged to depend either upon wood or sheet metal for a finishing material.

In Fig. 6 a design for a cornice is sketched which presents a face view, while in Fig. 7 a cross section of wall cornice and roof is shown, the covering of the roof being of the style of tile shown in the last paper. Notice how the gutter is made to contribute to the cornice, as a member of it, and how effectually the cornice section in the form of a supporting bracket covers and protects all the wood work entering into the roof construction at this point, which is ordinarily exposed. The gutter should be lined with metal, which can be carried to such point under the first course of tile as the judgment of the builder may demand.

In Fig. 8 the gutter section is shown in the form in which it emerges from the press, each block length represents two sections of the gutter, or upper member of the cornice, which it also is. The block is scored as formed, and the unshaded portion shown in the sketch drops out when the parts are separated. In Fig. 9 may be seen the lower or bracket section of the cornice as it leaves the machine, it embodying also two lengths of cornice section when the scored parts are properly divided. Referring to Fig. 7, it will be noticed that an air chamber is left between the cornice section and the ends of the wood rafters, and that the plate, which receives and makes a seat for the rafter, rests upon and holds securely in position the bracket, or lower cornice section, which is further held in position by being seated in mortar, at the point of junction with the wall. It may be still further secured by nailing to the rafters on which its upper section rests. It will be noticed that the gutter section forms also practically the lower tile course, but that it is equally well adapted to use in connection with shingles, being perforated at its upper edges for nails, and being thoroughly supported by the bracket section. Attention is also called to the fact that by a change in the pitch of the gutter and tile section the same system of cornice construction can be made applicable to the fronts of business and residence blocks, where flat felt-gravel or metal roofing is employed. The sketches show designs of a character of work simply and easily produced. Reference to the dimensions of the blocks, Figs. 8 and 9, will show that for size they are far within the limits of possible performance. Other members may also be added, and without a demand for larger blocks than those sketched, the height and projection of the cornice may be considerably increased.

We call attention here, to what we deem to be the superior results attained as against, first, an inflammable material like wood, which requires periodic applications of paint, and is then comparatively short-lived. And then as against metal cornices, costing as much, and perhaps more, in the outset for equally pronounced effects, and requiring also repeated paintings to keep in good order. The use of a metal cornice also calls into the field an additional set of contractors to supplement the work of the mason and carpenter.

It is proper to assume that the effects which may be had by such use of terra cotta trimmings, being in harmony with door, window and porch trimmings, and in keeping with the masonry treatment generally, will be much more satisfactory from the artistic standpoint than those arrived at by present methods. What architect would not prefer to embody in his designs masonry treatment from foundation to roof if his conceptions could be carried out without too great attendant cost? What builder of a brick edifice would not prefer to embody in the ornamental feature of his work that which should compare in durability and character with the walls of the structure? No one will question but that wood and metal have been resorted to for such purposes simply because stone and terra cotta trimmings have in a great majority of cases been found too costly. Machine made terra cotta trimmings can be produced at such reasonable cost and of such artistic character and such a range of tone and color that it seems safe to assume that these cornice wares and other trimmings as corner blocks, window caps and sills, belt cornice, etc., to match will meet with a cordial reception and a large demand.

In closing this series of papers, the first of which appeared in the May issue of 1897, a brief summing up of points specially worthy of emphasis will not be deemed out of order.

Those who have acquaintance with the strength of hollow clay wares as employed in fire proofing, will not question the strength of a block with walls of one inch in thickness if of good clay and well burned. Our first interviews with architects dissipated any doubts we had entertained of their hearty acceptance of the blocks on this score. Two considerations may properly enter into an estimate on the part of one unacquainted with the strength of hollow blocks.

1st. The crushing strength required of a brick is largely called upon for the support of its own aggregate weight. To illustrate. A 30 foot high, 12 inch brick wall will impose a burden upon each surface foot of the lower course of brick of about one ton per foot more than will be imposed upon a surface foot of block wall of the same height—and this is the chief burden a brick wall or any wall of masonry is required to carry, unless the building is used for heavy storage purposes. We have before us a letter recently received from Mr. E. E. Baldwin, of Conneaut, O., who has a three-story business block built from grade-line to roof of one course of eight-inch blocks, a cut of which is here shown. This block includes an opera house, and Mr. Baldwin answers questions proposed by us as follows: Block was built in 1894; thickness of walls in basement, two courses 8¼-inch blocks; walls above basement, one course of 8¼x8¼-inch blocks. The walls are sound at this date, and I think them as substantial as brick. The plastering is laid directly upon the inner wall of blocks; has never shown leakage anywhere; used one-half each of lime and cement in laying wall; think the general appearance is better than if walls were laid of pressed brick. The general opinion of the public is that I have the finest block in the country.

We cite this instance of a three-story block, with 8¼-inch hollow walls, used for a purpose (opera house) in which abundant strength should be had, and in which a good 12-inch brick wall would seem to be none too substantial, as showing to what service the blocks have been put. We would not ourselves think of using a block of less than 12-inch thickness for the first story of such a building, 10-inch for the second, and 8-inch for the third. Indeed, would recommend the same thickness of wall as if laid of brick.

We have recently reviewed an article in the Clay-Worker of March, 1893, being an address delivered by George S. Tiffany, of Tecumseh, Mich., before the February convention of the Ohio brick and tilemakers. The address was on the subject of "Hollow Blocks and Hollow Block Walls," and he asks the question, "Why have not hollow blocks come into more general use?" In his answer he quotes the couplet:

"Follow your father, good son,
And do as your father has done,"

As applicable to the case. He makes out the brickmaker to be a "slow coach," when he states that after 6,000 years of brick-making he is still discussing the question of "how brick shall be made." After discussing the sameness characterizing brick



Baldwin Opera House Block, Built of Hollow Blocks, Conneaut, Ohio.

structures, he proceeds to say: "We must have other forms for the construction of walls. Ornamental brick are pretty when you are near them, but when you are at a distance sufficient to take in the form of the building, they (the individual brick) are scarcely noticeable.

"Outside decorative work should be on a larger scale. Terra cotta manufacturers appreciate this fact. * * * We have committed the same error in hollow block making that we have in brickmaking. There is no variety that is worth mentioning. Nearly all manufacturers make the same size block. Nearly all have the same print on their cards, which is the foundation of a house. One might infer from this that they were only suitable for foundations, and this is the truth as they are made. * * * We may have the large blocks, but they should in some way be made to show a number of surfaces. While a glazed tile looks well in the foundation, because it is adapted to that position, it would not look well in the superstructure. We want warmth of color, but no glazing above

the foundation, excepting, perhaps, on a very small scale in decorative work. There is no question of the value of hollow blocks as a building material. The problem is to make them and lay them in shapes, proportions and colors that are pleasing to the eye. * * * Oh, there is money in beauty. It often costs no more to make a house look well than homely. A dwelling may be so constructed as to manifest comfort, happiness and prosperity," etc.

We have taken the liberty of quoting thus freely from the utterances of one well known to the clayworking fraternity, because at the time of delivery of the address, now over five years ago, it accurately set forth the then condition of the hollow block business, and as accurately set forth the requirements essential for its securing a position before the building public, all summed up in the single sentence, "They should (the blocks) be made in shapes and colors that are pleasing to the eye." This is and has been our contention, as those who have followed us in these papers must be well aware. Many new block forms have been presented, having reference both to construction and ornamentation. Cornices, belt courses window and door sills and caps, window and door casings, mullions, columns and balusters, angle blocks, and chimney tops all have come before us with the purpose of meeting the requirements of constructive details and in a manner to please the eye. At the best, however, the artistic has only been hinted at, but the possibilities in this direction have at any rate been foreshadowed. Then as to "proportion." It is not necessary to cling to the standard sizes recommended in these papers on the ground of economy in both outfit and output. The demands of the architect and builder in this matter of proportion can be met, and we have shown how variety can be introduced, even in the retention of the standard form of block, by the design imprinted on the block, the various broken Ashler designs being conspicuous.

When it comes to color, we are bold enough to assert that by no other process of clayworking can variety be so well secured and at such modest cost. As many of the readers of the Clay-Worker may not have followed us closely in our "piece-meal" presentation of the imparting of color, we will briefly state that the manufacturer who may be working a clay of a single and uniform shade, when well burned, may still furnish his customer with trimmings of a great variety of shades. Of course, these colors or shades will be little more than skin deep. So is the enamel on a brick or tile. It makes little difference, when applied to the ornamental details of construction, whether the color permeate the whole body or not. In a dry-pressed brick, color needs to be incorporated with the whole body of material used, whether it be a mottled brick or a solid color; but in the process of manufacture attending the production of machine-made ornamented terra cotta blocks, any desired material for shading or glazing, or for a vitrified surface, may be sifted upon the ornamental roller die, or upon the block after it is formed and before it receives its ornament design, and in such manner as to be thoroughly incorporated with the surface of the block. We have shown, too, how the background of such figured face may, by reason of its receiving the greater roller pressure, be given a deeper shade of color than the raised face of the figure, and thus be made more conspicuous to the eye at a distance.

If we have seemed at times to refer disparagingly to brick, or have seemed to make invidious comparisons, it is not that

we fail in yielding to brick its due pre-eminence as a building material. It has in the last ten years or more taken a position so far in advance of its old-time stamping ground that, in many respects, it is among the new products of the last score of years. After having admitted this, we still venture to predict that the triumphs of the clayworker in the next twenty years will be won largely in improved methods of producing hollow terra cotta building blocks.

MANUFACTURING SLAG BRICK IN RUSSIA.

THE FIRST RUSSIAN slag brickworks were built at Jekaterinoslaw, with an investment of \$81,000. The daily production is 40,000 large-size brick, but tiles for bridges, etc., are also manufactured. At present a day shift of seventy and a night gang of forty men are employed. A sixty horsepower engine furnishes the power. The granulated slag is hauled to the works and dumped outside, only a part being stored in sheds for use in rainy weather.

The process of manufacture is very simple. First, the granulated slag is sieved in a revolving screen, and then it proceeds



Residence of Glazed and Unglazed Rock Face Hollow Blocks.

to the drying kilns, being fed at one end of the dryer and discharged at the other. The dried slag is taken to a pit, from which it is conveyed to a ball mill. In another mill, lime, which must be added to the slag in a proportion of from 4 to 10 per cent., is ground to a very fine powder. At this factory 4 per cent. of lime is added, and the total contents of lime is 55 per cent. In the second stage of the process the ground slag and the powdered lime are mixed dry in a mixer consisting of a screw-like device. In the third stage the powder is pressed into brick in a dry press of the revolving type. Finally the brick are taken to racks, where they are allowed to dry. This work is done by girls, whose hands are protected from the caustic action of the brick. At first the ware is very tender, and must be handled very carefully, but, after six days, they are perfectly hard. Burning is not necessary. These brick are especially adapted for work under water, as they possess strong hydraulic properties. Slag brick are much less porous than clay brick, and have an appearance strongly resembling gray stone. They also withstand high as well as low temperatures. Nails can be driven into a brick without causing it to crack. In shape the slag product is perfect, weighs less than stone,

and requires little mortar when laid up. The tensile strength is about 312 pounds, the crushing strength from 1,250 to 5,600 pounds per square inch, according to the time of hardening. The selling price of the slag brick is \$7 per 1,000.

—From "Stahl and Eisen.—

The slag used in the manufacture of these brick is the waste product of blast furnaces, and is obtained by running the highly heated liquid slag into water. By this treatment the mass becomes granulated and assumes strong hydraulic properties. Slag not treated in this way cannot be used for making brick. The granulated slag, with the addition of some lime, is virtually a cement, and is used as such to a large extent. Two French slag cements were found to have the following composition:

Silica	22.45 per cent.	35.00 per cent.
Alumina	13.95 per cent.	15.00 per cent.
Iron	3.30 per cent.	1.10 per cent.
Manganese	—	.32 per cent.
Lime	51.00 per cent.	45.00 per cent.
Magnesia	1.35 per cent.	trace.
Sulphur	.35 per cent.	.35 per cent.
Loss on heating, 750 per cent.		2.30 per cent.

The specific gravity of these cements was .905, and 25 per

That's why the other fellow gets the trade, and it's quite reasonable, proper and just that he should.—Chas. Austin Bates.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK—Twelfth Paper.



plant itself was pushed with the utmost dispatch. Where perhaps a few months before the development of the brick idea the frogs were having their melancholy chant, there was now seen a brick works, with a full complement of kilns and machinery.

MOST OF THE READERS of the Clay-Worker have undoubtedly watched the beginning of some pressed brick works, being involved in the process themselves or as disinterested spectators. Nearly all of the factories observed by the writer have shown an enormously rapid growth during their youthful period. No sooner the necessary capital was raised when a hasty survey was taken of what was supposed to be the clay bank, and the erection of the plant itself was pushed with the utmost dispatch. Where perhaps a few months before the development of the brick idea the frogs were having their melancholy chant, there was now seen a brick works, with a full complement of kilns and machinery. Manufacturing was commenced as soon as possible. At this stage the intensely hopeful period of the young concern gave way to one of probation, the so-called experimental period. This, as we all know, is a time fraught with all sorts of surprises. New facts are constantly being discovered, and usually the clay does not behave with the docility which promised by the beautiful sample brick so kindly furnished by the machine men.

As the circumstances may be, the time of probation either ends in a healthy business life, enjoyed either by the original founders, or, quite as often, by their successors, or in financial death. If the market is good, the clay satisfactory, the plant well equipped, the shipping facilities all that could be desired, and plenty of capital is ready to support the undertaking, with proper management it will succeed. If these conditions are not met, the result is doubtful.

The question of market should be carefully studied, especially in these days of lively and even aggressive competition. The

first point to be considered in this connection is the quality and quantity of clay. Will it be possible to produce extra fine colors, together with perfect shape, or must the business be confined to the production of one color which is nothing out of the ordinary? In the first case, the market radius may be a wide one; in the second, it is narrowed to one locality. Where one is enabled to manufacture ware of more than ordinary merit it is not prime requisite to be located near a large town, but the manufacturer not so fortunately situated is compelled to depend upon one city. For instance, a factory working a No. 2 fire clay, which will produce a line of buff, flashed and gray brick, is considerably in the advantage over a concern possessing only a red clay of ordinary color. The ware made from the light-burning clay will stand freight charges which would put the red brick out of the field. But this difference is somewhat evened up by the fact that the higher-priced brick find a much more restricted use, while the cheaper product is sold in larger quantities. Of course, if the red is a very fine and uniform shade, like that produced by the Bedford shale of Northern Ohio, the conditions are more favorable.

Long-distance markets require a first-class brick in every



Residence Built of Ornamental Hollow Blocks.

cent. of water was required to make a mortar. The setting begins after five hours, and the cement hardens after ten. The tensile strength was found to be 450 pounds and the crushing strength 4,500 pounds per square inch.

THE TRADE JOURNAL.

If you want to borrow money of a man, would you go to him when you knew he had it, or when he was dead broke?

If you wanted to marry an heiress, would you "ask papa" when he had had a terrible day in the wheat pit, or when he was comfortably filled up with goods things to eat and drink?

If you wanted to get a man into a "quiet little game," would you tackle him when he was alone, or when he was on the way to church with his wife and mother-in-law?

There's a proper time for all things.

The proper time to make a business proposition to a man is when his mind is on business, when he is right in the thick of just the business you want to talk about.

When a man sits down and commences to read his trade journal, his mind is on just the business you want to interest him in.

The question of what to buy and where to buy it is one of the things he depends upon the journal to solve.

If you have anything to sell him, and your ad. isn't there to tell him all about it, some other fellow's will be.

respect. Color, shape, texture, hardness of burn must be equal to the best that is produced. Any inferior product manufactured at an out-of-the way place is excluded from the great markets, and works under difficulties in supplying the home markets.

Hardly inferior in importance to the market are the shipping facilities. Freight rates, in these days of sharp competition, decide whether a brick is kept out of a market or not. Yards depending upon a larger city, or a certain section of a State, must be located either in the city or centrally with reference to the district comprising the market.

—Brickmakers Should Know Their Clays.—

As a matter of course, it is absolutely necessary for a modern plant, intending to produce first-class ware, to possess a thoroughly well equipped factory. This means a systematic arrangement, from the bank to the freight-cars. And right at the clay bank is the place where often the greatest mistakes are made, most of them at the very beginning. It is a fact that many factories representing large investments actually do not know their clay when they commence manufacturing. They may have had the usual samples made and may possess a general idea as to what might be produced, but the absolute knowledge of the peculiarities of the material, the various stratas composing it, the extent of the deposit and the variations in color due to changes in thickness of the veins, weathering or other causes, are wanting. The first round of burning usually develops some startling results, which give rise to a peculiar collection of shades in the stock sheds, and which make the shapers wonder how they will ever get out a standard set of shades. To start with, the sheds will be filled with brick of incongruous shades which subsequently cannot be matched. After a good deal of annoying experience the clay will at last be properly mixed, so as to keep the colors within reasonable limits. By this time, however, several contracts might have been lost and a good deal of injury done to the reputation of the concern, for architects are quite apt to become impatient. The stock made during the experimental period must now be removed from the shed, at almost any price, to make room for the standard colors. Now, all this expense and anxiety might, for the greatest part, have been avoided by doing the experimenting on a smaller, and hence cheaper, scale. Before investing capital it is necessary to know the quality as well as the approximate available quantity. It is not sufficient to dig a shallow hole somewhere along the bed of clay and to test the material thus obtained, but it is essential to know the entire strata to be worked. In more than one case have new manufacturers come to grief, owing to neglect in this respect. Let us suppose a hill of clay, essentially high in carbonate of iron, which on the surface appears as the oxidized form of iron, ferric oxide. Clays or shales containing ferrous carbonate have a bluish or greenish color. Now, wherever weathering has been able to take place that is near the surface the carbonate has been converted into an oxide, and, in place of a hard, bluish clay, we find a red, plastic material, very nice to work and burning to a beautiful red color. But as we proceed to work this clay, we finally strike the hard, blue mass. Right here we will find a stumbling block, if we are not prepared for this change. On making and setting a kiln of brick made from the blue clay we not only find the color changed, but we are also very apt to meet a very undesirable kind of product—the black cored brick. If we do not understand the situation, it is not unlikely that we may repeat the performance until we realize the fact that clays containing carbonate of iron must be burned much slower than those colored by ferric oxide. The reason for this lies in the great affinity of ferrous oxide for silica. As soon as the carbonic acid of the carbonate has been expelled, and a ferrous oxide has been formed, the latter, if the temperature is high enough, combines

readily with the silica to form a dark-colored silicate. But ferric oxide requires a much higher heat to form the silicate. Ordinarily it gives us the red color of our brick. Hence, we know that the ferric oxide is the slower flux but the safer ingredient for our purposes. The best thing we can do with the ferrous iron in our clay is to keep down the heat after the carbonic acid has been driven off and to admit a large excess of air. By this means we oxidize the ferrous iron to the ferric form in which we want it to be. Of course, we must allow sufficient time for all the oxide to be converted to the ferric condition. If we hurry matters a little too much, so that the center of the brick has not been oxidized, the natural result will be that black ferrous silicate has been formed there, giving rise to the well-known black core so heartily detested by our brickmakers.

From what we have experienced, it is quite evident that, had we known more about our clay on the start, we would not have been taken by surprise, and could have adopted a definite line of action. We would have known that there are two distinct kinds of clay in our hill—one a soft, weathered clay, burning easily to a nice red, the other a less plastic material, requiring special attention in burning. We could have proceeded in two ways. If, after a systematic examination, both clays had been tested, and the results carefully compared, several ways of working the clay deposit could have been followed. Either all of the weathered or all of the unchanged clay might be used, or, perhaps, a mixture of the two. In the first case, it will be necessary to work along the out crop and strip down to the blue material; in the second, the red clay must be rejected, unless it is found practicable to mix them. Of course, the quality of the clays and local conditions must control this. Where the available land or the clay deposit is narrow and the oxidized clay vein thin, one will be compelled to depend mainly upon the blue clay. Here mixing the clays is not advisable, since sooner or later the red material will be exhausted, and it will be necessary to depend upon the blue entirely. Hence, it is better to start with the unoxidized clay in the first place. But where one has the use of a larger area of clay land upon which the weathered clay is available in a good working thickness, it will probably be more economical to use this oxidized clay. Mixing the two materials may be practiced in this case, if so desired. But if the red clay is found in a body which will cover the needs of the plant for many years, it will not be found necessary to work the blue, since the latter is more difficult to prepare and burn.

However, plastic red clays on top of blue material not always owe their origin to decomposition and oxidation of the lower strata. They may be formed by decomposition on top of blue drift clays. In this case the two clays have no relation to each other whatever, and usually are of entirely different character. Most of the drift clays have their iron in the form of a carbonate, and, being extremely tough, yet showing little bonding power, they are very difficult to work, and are never used for making pressed brick. Any one having the slightest knowledge of geological formations will have no difficulty in distinguishing between a red clay formed by weathering from a hard blue clay or shale and one deposited upon a glacial drift.

AMERICUS.

THE SAFETY OF RAILWAY TRAVEL.

Last year on American railways one passenger was killed in accidents out of every 2,827,474 passengers carried. That is to say that you can take a train 2,827,474 times before, on the law of averages, your turn comes to be killed. You will have to travel 72,093,963 miles on the cars before that turn comes, and 4,541,945 miles before you are injured. If you travel 20 miles every day for 300 days in the year, you can keep on at it for 758 years before your turn comes to be hurt. If there had been railways when our Saviour was born and you had begun to travel on the first day of the year A. D. 1, and had traveled 100 miles in every day of every month of every year since then, you would still have (in this year 1898) nearly three million miles yet to travel before your turn came to be killed.

Written for the CLAY-WORKER.

BUTTON HOLE TALKS.



HE MOVED just a little, to rest himself, and for an instant I thought he had let go and that I was free, but as I started to escape he only clinched the button-hole the tighter, tucked my coat-tail down under him, sat down on it harder than ever, drew a long breath, and continued:

"Do you notice the determined manner in which these men go at their convention? Most of the conventions I have seen are run very differently. Men seem to come to them for a 'high old time,' and are so busy taking in the town that you can't coax them into the convention hall, or, if by chance they do get in there, their minds are not in the business of the convention, but are running as to what shade of red paint they will use that night, and as to what particular section of the town they will apply it to. Ordinarily the chairman and secretary have to work might and main dragging out men to talk, so as to coax out a respectable programme.

"These men, though, just flock right in and fill the hall. Some one reads a paper, and—bang! six or eight earnest fellows are fighting for the floor. That's the way it is through the whole session and the whole convention, too, for that matter. There's not a minute in which some one is not jumping to catch the chairman's eye. Every speaker is just full of ginger, too, not meandering around, stringing out senseless words, but just popping them straight in, hot and fast, every one pointed and sharp and true to the mark every time.

"These men love their business. They are true devotees. Each one comes, not as a delegate whose expenses are paid by others and who is out for a 'hurrah,' but as an earnest man who thoroughly believes in his business, and who is putting up his own good money to attend. Each man is a man, strong in his manhood and honest and devoted in his calling. He comes to learn all he can, and at the same time he wants the equation complete—wants not only to receive, but to give as well. If he gets a point from a brother to whom he can give none in return, he can, and does, repay by giving a pointer to some other brother who does need it, and thus does his duty and keeps the balances as nearly even as possible.

"These are captains and generals, every one of them, and their interests are large indeed. Their employes and their families number an army, and they look to these men to make no mistake. Theirs is the problem to think and scheme and manage and plan, or work will be diverted and labor and machine stop, and hunger come in the place of plenty.

"But the patience of these men! That is their phenomenal quality—their long suit. The business demands that they must possess or acquire it. It must be of the best quality, and they must have lots of it, and they must expect to keep it in use. Machinery breaks. Clay cracks. Kilns kick. All the countless batch of troubles that accompany the clay business come trooping along, sometimes singly, but more often in flocks, and all these must be overcome by this leader, who must plan and think, must scheme and sweat, and yet wait for results, for it is all long-range work. The result can be told only after long waiting—after the grinding and the mixing and the pugging, after the drying and the burning and the cooling. Why, the patience is just simply phenomenal. Not since Job went out of the clay business—What? Wasn't? Well, I guess yes! Woke up, did you? Thought because so many fellows told you so much that you knew it all did you? Say, if Job wasn't a clay-worker, just prove it to me, now will you? That's what I want I notify you, though, right now, that he never acquired that great stock of patience in any other line. He could reach out and gather in and acquire and hold no such stock of patience in any other business than clay, and that's where he got

it, sure. There's only one thing bothers me and goes against this theory, and that is that little mention about his wife's grumbling. Clayworkers' wives never do that, you know. I am satisfied, though, that she was his second wife, and married after he quit clay, as his first wife would just naturally have been worn out and sick, tending that big family a-getting night lunches for them when they were water smoking, so that with sweeping clay out of the house and getting food into the house, and, incidentally, into them, she certainly would have been justified in dying. So I am sure the grumbler was number two, and, consequently, antedated his clayworking experience. He was a clayworker all right, though, and a brickmaker, too, and you know he was. Now don't you. What's that? Noah was! Know 'e was! Now, look here; that's something I won't stand. I don't grumble at trouble or grief or care or worry, but I won't listen to bad puns. Where's that club?"

He reached for his cane, thereby easing up on my coat-tails on which he had been sitting, and I fled. GATES.

THE OHIO SCHOOL FOR CLAYWORKERS.

THE OHIO STATE UNIVERSITY, and with it the Ceramic and Clay working department under Prof. Edward Orton, begins another school year on the fourteenth of this month. With each succeeding year the work of this de-



R. C. PURDY, Buffalo, N. Y.

partment becomes more and more important. This comes not alone from the impetus which is given it through the material support and sympathetic encouragement of the N. B. M. A., but as well because of the added experience of those interested directly in its work and the "esprit de corps" of the teachers and pupils.

Mr. Ross C. Purdy, who won the N. B. M. A. scholarship for the ensuing year, is well equipped for the duties devolved. It is expected of Mr. Purdy that through his capacity for serious and energetic efforts he will be able to place many facts of value before the clay workers of this country. The opportunity which is before him is great, and from assurances which come to us we predict that there will be no disappointment on his account. We are certain that from time to time we shall be able to present a record of valuable work on his part, and

report the satisfactory progress of the class of young clay workers who have enlisted for the war. We earnestly hope none will lag in the work or "fall out" for any reason, but that all will march bravely along, keeping step to the tune of progress and be mustered out with honor at the end of the term.

Written for the CLAY-WORKER.

BRICK PAVEMENTS BEST FOR SMALL CITIES.

—Good Paved Streets Bring Trade to Merchants.—



BRICK AS A MATERIAL for street paving has proven entirely satisfactory to the people of Laporte, Ind., and in view of that fact the ground is now being prepared for another quarter of a mile of brick paving, which will be put down this fall.

Those natural conditions which regulate the passableness or unpassableness of the streets of Laporte are such that for nine, I might say almost ten months out of the year our streets are in excellent shape. The soil has the faculty of absorbing quite readily the water which falls leaving the streets, as soon as the sun gets at them, in very fair condition. Paving, of any sort, therefore, is more a matter of luxury and for good looks, except in the down town business districts, than a matter of necessity. Nevertheless, before Laporte had any paved streets whatever, the heavy drays, trucks, farmers' wagons, in fact, vehicles of all classes, so cut up the streets that were used the most that a great share of the year they were almost impassable. As in all county seats, Laporte merchants derive considerable trade from farmers residing in the surrounding country and the bad condition of the business streets caused the farmers to avoid using these street as much

They proved satisfactory for a year or two after being put down, but, when it became necessary to put down new paving, the question of using brick was agitated. That style of street paving was just coming into vogue for cities of this size. There appeared objections, however, the principle trouble seeming to be that brick paving was noisy. It is worth the experiment, however, and I can say with safety that now, after four years' trial, not a business man of LaPorte would be willing to exchange the present handsome brick streets for those of any other material. Of course, asphalt has not been tried in LaPorte, but brick has proven to be so eminently satisfactory that there is no disposition to experiment further.

The aim of the street committees in each instance when street paving was done in this city was to use what in their judgment was the best brick obtainable at the time. Four years ago the first brick paving in LaPorte was put down. To-day that paving shows practically no wear, and, but for a little chipping on the edges, it is as good as when laid. The larger sized blocks had not come into use then, and in selecting the quality the committee, after various tests had been made, came to the conclusion that the Canton standard shale paver was the best brick then offered. In the matter of a foundation



Four-year-old Brick Pavement, LaPorte, Ind.



as possible. This meant loss of trade. Our handsome brick paved streets now are an attraction to the farmers and agriculturalists of the surrounding country. As a trade getter paved streets, particularly those paved with brick, will always be found in the front rank, for I know by personal observation that those stores facing on brick paved streets do more business than those facing on cedar block paved streets and a great deal more business than those facing on streets that are not paved.

Years ago, when cities of eight and ten thousand inhabitants began to put down paving, Laporte, in common with other places of its size, began by laying the old-time cedar blocks.

gineer and capable men on the committees, the work, therefore, being done as it should be done. Care has always been taken to have all water, gas and sewer pipes and connections laid long enough before the actual paving was done to insure the proper settling of the ground. This is certainly a requisite for good paving.

Our second pavement is Poston block—rounded edges. There is no chipping to this, and to-day it is as smooth, if not smoother, than any newly-laid pavement.

For a filler nothing but sand has been used. It has proved so satisfactory that there has been no desire to experiment with cement or asphalt, although on the two-year pavement

cement was used around the man-holes and along the gutter stones. The new pavement will be sand filled. Great care has been taken to keep the streets clean, and visitors note this fact at once. It is the constant duty of one man to keep the streets free from rubbish and refuse of all kinds. This is done from both a sanitary and an artistic point of view.

View No. 1 shows pavement which was laid four years ago. There are no worn spots, the dark places being refuse. In the background is our \$325,000 red stone four-story court-house. No. 2 also shows four-year-old brick. The traffic on this street is very heavy, and it is gratifying to note that no worn places whatever appear. The pavement in View No. 3 was laid in 1896, and has stood the heavy traffic from the Lake Shore railroad passenger and freight station exceptionally well. In No. 4 is shown another stretch of two-year-old brick, which is in excellent shape. View No. 2 also shows a street intersection, and portrays a crossing without and one with a gutter way. One point of advantage in regard to our pavement,

IMPORTANCE OF GOOD FOUNDATIONS.

Prof. Ira O. Baker's Views and Experiences in Laying Brick Pavements.

THE FIRST and important thing in building a pavement is to get the sub-grade well rolled. Ordinarily the rolling is done with a roller weighing about thirty pounds to the linear inch of the roller. It should be 300 or 400 pounds to the inch. It should be so heavy that all soft places in the grade are found and made firm. Then there will be no chance for settling and the consequent displacement of the paving. Of course, a pavement with holes in it is a failure.

We have at the University a piece of model pavement. There is only about 600 or 700 linear feet of it. We had a street to pave through the grounds, and determined to make it as near perfect as we could. It has been down two years. Of course it is not subject to great wear, but it shows what a pavement



View 3. A Two-year-old Pavement Subject to heavy Traffic.

which I have not noticed in other cities, and it is quite plainly brought out in the last view, is the street crossings. They are laid just one inch above the rest of the pavement, so that no water will ever remain thereon, but will at once seek the gutter and be carried away by the drains.

Though but a quarter of a mile of pavement will be put down this fall, the expectation is to lay a mile or more next year. Metropolitan repressed block has been selected for the new work. With the paving which will be completed this year and next, LaPorte will soon be able to claim more fine brick paved streets than any other city in proportion to its size in Northern Indiana.

EDWARD J. WIDDELL.

He read a little ad. by chance—
Those fake announcements, rot 'em!—
"Sure method how to keep your pants
From fraying at the bottom."
He sent a quarter right away
To some smart gang of mockers;
The answer came without delay,
And read, "Wear Knickerbockers!"

should be. It is made of brick on a concrete foundation. The foundation is of crushed Indiana limestone. The filler is of sand.

In building that we had an experience that illustrates what I was saying about rolling the sub-grade. Several years before the University had laid some little drains across the street. One would have supposed that they would have filled up long before. Yet, when the roll went over the street, it made depressions exactly on the line of those drains. The depressions were about two inches deep. We filled them up, of course, and rolled them again. Even if they had not been filled, the concrete would have bridged them over. A two-course pavement would have sunk.

Concrete has this advantage, it makes a firmer pavement. It is, as I said, the better pavement, but I do not know but that the two-course pavement is just as good for what it costs as the concrete is for what it costs. It depends on the local conditions. Some cities find one kind better and some another. Bloomington is putting down a great deal of pavement, and, as far as I know, has never put down anything but two courses.

Written for the CLAY-WORKER.

BRICK PAVING IN DES MOINES.



WHAT MATERIAL will produce the best street pavement is a vital question, which has for years agitated the minds of progressive city builders. Des Moines, passing through an experimental stage in this matter of nearly twenty years, has solved the problem, and declares most emphatically for brick. The experience gained has been a costly one.

Commencing in the year 1882, the first paving spasm took the form of cedar or cypress blocks, and car-loads of these clean-looking, pretty, round blocks were shipped in from a long distance and laid on plank foundations along some of the principal business streets. This paving was elegant to ride upon, and a great improvement upon the sometimes trackless waste of mud.

From 1882 to 1889 there was laid 294,458 square yards of this

was destined to afterward set the pace for all future work. Capitalists became interested, and brick paving plants started, until to-day there exists in the city manufactories with a capacity of 300,000 brick per day. Nor is the facility for supply in excess of the demand. It stands to reason that the experience so dearly purchased by Des Moines will be utilized by other cities as the officials become acquainted with the facts regarding the perfection of manufacture to which this kind of brick for paving has been brought, and its cheapness and desirability over other kinds of paving are better understood.

For proof of the faith that Des Moines citizens have in the general utility of brick for paving purposes, they not only point to the home capital invested in these brick plants, but cite the fact that there are nearly eighty miles of streets in their city so paved.

In this utilitarian age they could see no necessity for importing asphalt from Trinidad, granite from the hills of Vermont, or cypress blocks from the Southern swamps, when nature had bountifully provided inexhaustible beds of clay right at their door, from which can be manufactured a better all-around



View 4. A Fine Street as Good as New—Laid in 1896. Page 188.

kind of paving, at a cost of \$497,462.26, and the legend of the latest report issued by the city engineer shows that every foot of this pavement has been torn up, and brick, good vitrified brick, substituted.

The adoption of brick was by no means spasmodic. So long ago as 1889 a brick fanatic named Harger, who had spent years in experimenting with the clay which abounds in this vicinity, succeeded in obtaining consent of the city council to pave Forest avenue, an outlying thoroughfare, with brick. The material was crude, for paving brick, as it is understood to-day, the real, vitrified, water-proof article, had not then been manufactured. Yet this pioneer job of brick paving, unlike the cedar block, still stands, and attests the good wearing qualities of even a common brick for paving, and this in face of the fact that the avenue became a favorite drive, and hence was tested by much more than the ordinary travel.

It was doubtless this experimental piece of paving that

paving material than any other in existence.

Various foundations have been tried, and the results of experiments prove that the street prepared by rolling, and then two courses of brick work, with a good top filler, provides the most satisfactory pavement. The concrete foundation, while good in its way, has the disadvantage of being difficult to repair, when any excavation is made in the street, while the two-course brick can be taken up and replaced any time, leaving the pavement as good as new.

The accompanying illustrations show sections of two Des Moines business streets paved with brick. These are but samples of the work throughout that enterprising city.

The city engineer, in his report for 1897, gives the average life of this brick paving on the down-town streets at from twelve to fifteen years, and upon the average residence streets from twenty-five to thirty years.

The improvement in the manufacture of brick for paving

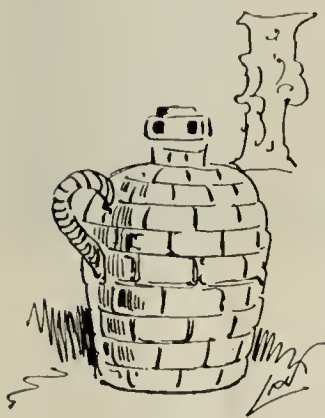
purposes has been very marked in recent years. The top edges of the brick are now beveled, thus preventing any shaling or splitting off, and giving more room for the horse's shoe to catch lodgment. The improved machinery and kilns greatly facilitate the production of vitrified brick, and it must be vitrified to wear well. Anything that absorbs moisture will rot or disintegrate, and hence the clay has to be subject to a great heat of longer duration than in the case of the ordinary building brick.

In the short space of ten years the manufacture of paving brick has become the chief industry in Des Moines. There are four plants in operation, with a capacity of 300,000 brick per day, employing about 500 hands, and having an investment of \$650,000 capital. With these large plants in constant operation, and eighty miles of streets paved with the product, there is little of anything Des Moines doesn't know about brick paving. It will pay to consult headquarters for information based on such experience.

PIONEER.

Written for the CLAY-WORKER.

FILLERS FOR BRICK PAVEMENTS.



IN BRICK PAVEMENTS a filler is essential to maintain the solidity of the pavement, and also to secure sufficient space between the brick to give a hold to the calks of the horse's shoe to prevent slipping. The variation in the size and the lack of trueness in paving brick prevent their being laid so snug and close but that they would move more or less, and especially roll with the traffic, with a consequent rapid destruction of the brick, if they were not held securely in place by the filler.

They would also be open to the same objection as its rival, asphalt paving, from the slipping that would result, if there were no spaces left to hold the calks of the horse's hoof, which is a very serious defect on grades, and where the character of the traffic is heavy, as in freight service.

The filler, or the material that is employed to fill the interstices or spaces between the brick, is, therefore, a very important detail in brick pavements as regards the above two functions, and, theoretically, these are all that should be considered. But in the present crude methods of street regulations in even our large cities, where streets are sometimes employed for vehicle traffic, but very frequently, aye, seemingly almost intermittently, employed for putting down railroad tracks, water pipes, sewers, steam mains, ammonia pipes, compressed-air conduits, telephone wires, telegraph wires, electric lighting conduits, etc., the street pavements have to be constantly torn up to permit the use of the public highway for these subterranean purposes, and until we have advanced to the point of maintaining tunnels for carrying them, paving material will have to permit of frequent upheavals. A third and very important essential of a filler is, then, to enable the brick to be taken up and relaid, an evil that considerably reduces the life of all pavements in the large cities, where this is frequently happening.

The materials which are employed as fillers, and which satisfactorily solidify the pavement, are:

- Sand.
- Cement.
- Tar and asphaltic compositions.

Each of these have their advantages under certain conditions, and it will be necessary to study them in detail to appreciate their relative merits, though local conditions will have to determine which is preferable for a specific case.

—Sand Filler.—

Sand was the first filler employed for brick pavements, and the great popularity it still enjoys is based on merit. For sand has the great advantage of low cost, as it is in all cases the cheapest filler. If properly used, it enables the pavement to be thrown open to traffic immediately after laying, as no time is necessary for settling, as with cement. It enables the pavement to be easily, rapidly and safely taken up, without breakage of the brick. It does not make such a tight, inelastic filler as to cause "drumming" by the raising or arching the brick in hot weather from expansion. It is open to the objection of washing out from storm water on heavy grades, and where the hydraulic or flushing systems of street cleaning are employed, which leaves the edges of the brick exposed, and, therefore, likely to "cobble" or wear out from the breaking and wearing away of the exposed edges. The sand also permits of the percolation of sewage, urine, etc., that may run over the street, and hence is not a sanitary filler, and, where the foundation is not concrete, the water that may soak through the sand-filled joints may cause the heaving and throwing out of surface of the pavement in winter from freezing. These faults will not be important where the subsoil is sandy, or is well drained, as the sewage or water will soak away as fast as it passes through the filler, but on undrained or clayey subsoils they are liable to cause more or less trouble.

The sand is worked into the joints or spaces between the brick after it has been laid and rolled to a true surface by either sweeping it over the surface or else by washing it in with a hose. The latter method is usually the quicker, but it is not so thorough and satisfactory as the sweeping system, if dry sand is employed. But, unless the sand is perfectly dry, so that it runs freely like water, the broom does not satisfactorily work in the sand, as it chokes and clogs in the imperfectly filled joints, if it is damp in the slightest degree. The surface of the pavement is, therefore, usually left covered with about half an inch of sand for a month or more after it is thrown open to traffic, to secure the thorough working down of the sand into every joint, with a consequent complete unification of the pavement.

—Cement Filler.—

Portland cement mortar, as a thin grout, is used to a considerable extent in the large cities as a filler, but it is questionable whether the future will indorse its use; though some engineers still regard it highly. The Portland cement is employed as a 1 to 1, to 1 to 3, mixture with fine sand, which is poured into the joints as a thin liquid, or grout. It makes a very thorough and complete unification of the pavement into a monolith, which is admirable for withstanding the washing of storm water or the hydraulic or flushing systems in cleaning the streets, and it prevents the infiltration of water, sewage, etc., thus making an ideal sanitary pavement. But the cement grout requires the closing of the street for at least a week after completion, to give the cement sufficient time to attain enough strength to bear the traffic, and it is very objectionable when the street has to be torn up, as it greatly increases the labor, causes the breaking of many brick, and necessitates the cleaning of the brick from the old cement before they can be relaid. If the pavement is laid in cold weather, there is a great risk of a noisy or "drummy" pavement, as the brick are liable to arch or raise off the foundation from expansion in the hot weather, as happened at Newark, N. J. The original expense of a cement filler is much greater than sand, and greatly adds to the cost in tearing up the pavement for street work.

—Tar and Asphalt Filler.—

Coal tar and asphaltic compositions are used considerably as fillers on high-grade pavements, and are likely to be exclusively specified in the future, when the best work is desired. For

while they are the most expensive in first cost, they have all the advantages of the cement grout in making an impervious, sanitary pavement; they permit hydraulicing or flushing; it does not wash out on grades; they cause no delay in opening the street to traffic, and they never cause a noisy or "drummy" pavement, as the tar or asphalt will exude or press out of the joints in hot weather, and so prevent arching. They are not as easy to remove when the street is torn up, and more breakage of brick results than with sand filling, but it is much better than the cement grout. The filler with asphalt as the base is more durable, tougher and more satisfactory than coal tar, and both are applied by pouring them into the joints as a hot, thin liquid, which, on cooling, forms a tough, slightly elastic, very viscous mass that effectively holds the brick in place, and retains large enough cracks as to insure a good foot-hold. For court yards, interiors, etc., where a neat, clean surface is desired, the tar fillers are not as satisfactory as cement, from their working out of the joints to some extent in hot weather, and the difficulty of overpouring in filling the joints. A PAVER.

Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 6.

Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

ROGERS.

THE ROGERS MENTIONED in our last paper was doubtless the same who issued a series of "Drama" designs in medium blue and perhaps other colors. As these are of no special interest to the majority of American collectors, I have not compiled a complete list. Those which I have recently come across are as follows:

The Adopted Child.
The Deserter.
Douglas, Act 5, Scene 1.
Love in a Village, Act 1, Scene 4.
Midas.

DAVENPORT.

The firm of Davenport & Co. operated works at Longport,



THE CITY OF MONTREAL.

By Davenport & Co. (Courtesy of the New England Magazine.)

Staffordshire, from 1793, the original buildings having been erected in 1773. Mr. John Davenport, the founder of the firm,

continued in business until about 1830, when he retired in favor of his two sons, and at their death a grandson of John Davenport continued the works. The wares produced by the Messrs. Davenport have always been of a high standard. Their



W. PENN'S TREATY, (variety b.) by T. G. (Courtesy of Godey's Magazine)

dark blue printed pottery was justly celebrated for the excellence of the engraving and the clearness of the printing, but they do not appear to have issued anything in that color especially for American consumption. Neither do they seem to have catered, to any great extent, to the American trade at a later date, when many of the other English manufacturers were sending to this country printed ware in other colors. At least one American design, however, has come to light, bearing the stamp of the Davenport works. The view referred to, however, relates to British America.

AMERICAN DESIGNS PRODUCED BY DAVENPORT & CO.

—Designs in Brown, etc. Border, Floral Design.—

City of Montreal.

C. M.

Job Meigh commenced manufacturing china at Hanley, England, in the Old Hall works, in 1770. In course of time the business descended to his son and subsequently to his grandson, Charles Meigh, who continued it until 1861. These works became celebrated for the highly artistic quality of their products and manufactured extensively for the foreign, including the American trade. Among other things Charles Meigh, between 1830 and 1840, produced a series of American views in various colors.

AMERICAN CERAMIC DESIGNS PRODUCED BY CHARLES MEIGH.

—Designs in Brown, Light Blue, Purple etc. Border, Vines and Small Flowers (Chickweed).—

"American Cities and Scenery" Series ("Improved Stone China").

Boston from the Dorchester Heights.
Little Falls, N. Y.
New York, City Hall.
Schuylkill Waterworks.

T. G.

Thomas Green produced print-figured china at Fenton, Eng-

land, between 1847 and 1859. This manufacturer seems to have used but one subject for his American patrons—the treaty of Penn with the Indians. The conception of the engraver of this design was indeed vague, as the Treaty Elm itself, under which Penn, in 1682, made his treaty of friendship and good will with the natives, is not represented. In its place are nondescript trees with clumps of foliage surmounted by bunches of unrecognizable fruit; pagodas and Oriental buildings. It is probable that there are half a dozen or more distinct varieties of this imaginative design.

AMERICAN CERAMIC DESIGNS PRODUCED BY
THOMAS GREEN.

—Designs in Black, Red, Green, Brown, Pink, Gray, Blue, etc. Border, a Stencil or Set Pattern of Small, Diamond-shaped Figures.—

W. Penn's Treaty—

- Penn standing, companion kneeling; two Indians standing.
- Penn, companion and Indian standing; squaw kneeling.
- Penn seated, companion standing; two Indians, man standing, squaw kneeling.
- Penn standing, companion seated; Indian standing, squaw kneeling.

J. H. & CO.

Joseph Heath & Co. were making goods for the American market at Tunstall, England, in 1829. They were the makers of the well-known residence of Richard Jordan design, which is among the most abundant of old English patterns in Eastern Pennsylvania and in New Jersey. It is found on entire table services and on every size of plate then made, and was printed in a greater variety of colors and shades, perhaps, than any other American view. It was drawn by W. Mason, a drawing teacher of Philadelphia, and engraved by F. Kearney, by order of some of the friends of Richard Jordan, the eminent Quaker preacher, after his death, which occurred in 1826. On the backs

Light Blue, Lilac, Purple, etc. Border, a Handsome Floral Designs.—

The Residence of the Late Richard Jordan, New Jersey.



HENRY CLAY PLATE.

By John Tams. (Courtesy of the New England Magazine.)

(The same central engraving occurs without border save a heavy line around the edge.)

Joseph Heath & Co. also produced a view entitled: "Ontario Lake Scenery."

J. & T. EDWARDS.

Previous to 1842 Messrs. James and Thomas Edwards conducted a pottery at Burslem, England, styled the Kiln-Croft Works. This partnership continued only for a short time, and Mr. James Edwards, in the year named above, purchased the manufactory of John Rogers & Son, formerly owned by John and George Rogers, and embarked in business alone.

LIST OF AMERICAN DESIGNS
PRODUCED BY J. & T.
EDWARDS.

—Designs in Pink, Black, Brown, Blue, etc. Border, four (or three) Steamships, marked "Columbia," "Caledonia," "Britannia," "Acadia" (In some pieces one of these vessels is omitted), "Boston Mails" Series.—

Gentlemen's Cabin,—four men.
Gentlemen's Cabin,—three men.
Ladies' Cabin.

The same central designs occur on plates etc., without border.

JOHN TAMS.

About 1840 John Tams was carrying on business at London, England. One of his relatives, probably a brother, James Tams, importer, of Philadelphia, was commissioned by Mr. John Price Wetherill, a wealthy resident of that city, to have two souvenir designs made in china in honor of General William Henry Harrison and Henry Clay, the occasion being a



"BOSTON, FROM THE DORCHESTER HEIGHTS."

(Central Design.) By C. M. (Courtesy of the New England Magazine.)

of pieces bearing this print is the descriptive title in an irregular framework surrounded by an umbrella-shaped device. The Jordan residence was at Newton, Gloucester county, N. J.

AMERICAN DESIGNS BY JOSEPH HEATH & CO.

—Printed in Red, Pink, Black, Brown, Mulberry, Gray, Green,

"barbecue" at Mr. Wetherill's country place at Walnut Hill, Montgomery county, Pa. It is said that a large number of these plates were imported, several of which are known to have survived.

AMERICAN DESIGNS PRODUCED
BY JOHN TAMS.

—Designs in Light Blue. Border, Two Marginal Lines.—

General W. H. Harrison, "Hero of the Thames, 1813."

Henry Clay, "Star of the West."

MELLOR, VENABLES & CO.

This firm was potting in Burslem in 1843. Of the China on which their names appear, only one series of designs seems to have been made for use in this country.

LIST OF AMERICAN DESIGNS PRODUCED BY MELLOR, VENABLES & CO.

—Designs in Light Blue, etc. Border. Ten Medallions, containing the Arms of Five States (two of each)—New York, Pennsylvania, Massachusetts, Virginia and Maryland.—

View of Rear of White House, Washington.

Capitol Buildings of the different States represented.

C. C.

There were several potters in Staffordshire, previous to the middle of the present century, for whom these initials might stand, but, in the absence of sufficient means of identification, the name of the maker cannot be stated with positiveness.

AMERICAN DESIGNS PRODUCED
BY C. C.



GEN. W. H. HARRISON PLATE.

By John Tams. (Courtesy of the New England Magazine.)

—Designs in Light Blue, Etc. Border, "Catskill Moss" (so printed).—

Boston and Bunker Hill (copied from engraving shown in "Boston Notions," 1848.)

J. B.

We have not been able to positively identify the maker of pieces bearing these initials.



THE RICHARD JORDAN PLATE.

By J. H. & Co. (Courtesy of the New England Magazine.)

AMERICAN DESIGNS PRODUCED BY J. B.

—Designs in Blue, Red, Etc. Border, Trophies of War and Peace.—

Texas, General Taylor in.

F. M. & CO.

A single design bearing these initials is known to collectors.

—Designs in Blue, Red, Etc. Border, Ships, Etc.—

American Marine.

LEGAL STANDARD FOR PAVING BRICK.

Judges Hosmer, Carpenter and Lillibridge decided against the board of public works of Detroit, Mich., in a suit brought by Holmes & Strachan to restrain the city from entering into a contract with John McLaughlin as the lowest bidder for paving Atwater street. The sole question for the determination of the court was whether the limitation of the brick was in violation of charter provisions requiring contracts of this nature to be let to the lowest responsible bidder. The advertisement required each bidder to restrict his proposals to three kinds of brick, the Nelsonville, Metropolitan and Century. The court decided that while satisfied beyond question of the good faith of the members of the board of public works, that the restriction of the bidder to brick made by three manufacturers is, in effect, the same as a restriction to one, and creates a monopoly which at once extends to at least part, if not the whole contract. The specifications provide that only such brick shall be used as are approved by the board of public works, and, having approved of these bricks made by different manufacturers, they asked for bids for a pavement made of either of the three

kinds of brick; that this is illegal; that is to say, three kinds of brick by name cannot be selected for use in paving, and if three cannot be chosen, then ten brick by name cannot be selected. In the court's opinion, a standard may be adopted and the bricks which come up to the standard may be used, and any brand may be adopted as the standard.

MAKING BRICK IN MEXICO.

Observations of a Clayworker in the Egypt of the New World.



WHEN I CROSSED the Rio Grande to the old town of Paso del Norte, now called Ciudad de Juarez in honor of the Mexican statesman, we had a stop of about one hour to allow the Mexican Custom House officers to examine our baggage. They are very courteous and perform their duties quickly. While the train was waiting here we took supper. It was a little early, but we knew there was no other eating house for two hundred and twenty-five miles south of here. I got a good supper, the price was one dollar in Mexican money, and when I was through eating I handed the landlord an American silver dollar and he gave me a Mexican silver dollar in change.

While we were waiting here a great many passengers en-route to California and other points west, crossed over the long foot-bridge from El Paso, Texas, to get a glimpse of old Mexico, the Adoby houses and the old church in Paso del Norte.

When in fact this is only a glimpse of Mexico, but it is enough to arouse the curiosity of the average American citizen to take a thirty minute walk from a town like El Paso, that is well equipped with modern machinery, good buildings with all modern improvements, built of brick—and a splendid quality of brick of the average American size, well burned, with a fine color. When this thirty minute walk will land him where he can see brick being made four times as large and used without being burned, these are called Adobys by the Americans, but called Dadrillos by the Mexicans, only sun-dried, which leaves them the natural color of clay, and see a man climbing a ladder with one of these bricks on his shoulder delivering it to the mason who is building the house.

The average American would judge these towns to be fully one thousand miles apart, from the surroundings, if that was all he had to go by.

Now our train moves south. Chihuahua is the next city of importance. It is two hundred and twenty-five miles south of El Paso, Texas. It is the capitol of the State of the same name, and is built on a high plain 4,700 feet above the sea, and has a population of nearly 25,000. It was founded more than three hundred and fifty years ago, so its growth is not that of the mushroom variety. The city is handsomely laid out in squares. A great many of the streets are paved and are remarkably neat and clean, with horse car lines running through the principal streets.

While Chihuahua has a population of less than 25,000, it possesses some grander buildings than some of the larger cities of the United States. The center of attraction in the city is the Cathedral. It is a grand and stately pile of light colored stone, with an immense central dome and two lofty towers. The facade of the Cathedral is embellished with life-size statues of our Savior and the twelve apostles. While the interior is ornamented with many fine paintings. The towers contain many bells, one of which was shattered by a cannon ball from the invading army of Maximilian.

The Cathedral was built in the early part of the last century at a cost of \$800,000, raised by a tax of two reals on each pound of silver taken from the Santa Eulalia mine. It is second only in size to the grand cathedral in the city of Mexico, and is,

without doubt, the finest structure in Northern Mexico.

I was shown the tower room in which Miguel Hidalgo, the Liberator priest of Mexico, who led the revolution of 1810, was confined the night previous to his execution, which took place July 31, 1811. A monument now marks the spot where he was executed.

—A View of a Mexican Brick Yard.—

Other buildings of note are the Bank of Santa Eulalia, Mexican National Bank, State House, Convent of San Francisco, theatres and hotels. When I had seen this much of the city I started out to look for some business, with my interpreter, on a salary of \$5 a day and his board. We went to one of the best brickyards in the city, which was only a little distance from the main part of the city. Here I was introduced to the owner of the yard, who took all the interest he possibly could in showing me his yard. He had one large shed with a round kiln under it that would hold about 40,000 brick of the American size, with a large arch under the center in which the entire kiln was fired from. This kiln was only used for the fine brick, as the common building brick is not burned at all. He had a fine cement drying floor about 150 or 200 feet square.

While we were standing on this dry floor talking, Mexicans



JAMES W. HENSLEY, Indianapolis

came in from every direction with tempered clay in sacks on their backs. Some were driving a donkey with the tempered clay on its back. They all came in on the dry floor and laid the clay down and picked up a brick mold, which had no bottom and would hold only one brick, size 16 inches long, 8 inches wide and 2½ inches deep. He prepared this mold, laid it down, filled it and cut the top off smooth with a straight edge, then dipped his hand in a bucket of water and smoothed the top of the mass, giving it a glossy finish, lifted his mold off and went to the next brick. In twenty or thirty minutes these men had used up their clay, and were all out and gone for some more.

The owner of the yard asked us to take a walk with him to see the yards of some of his competitors, which we did, and found them making brick in a similar manner.

Now we must go around and see some of the buildings which

he had erected, and the good material which he had made and used in them. Most of the buildings he showed us were adobe. Finally we came to some where the brick had been burned, but not enough to kill the fishing worms which were in the clay. But the walls are built very heavy, and, with no frost or freezing and little rain, they stand for centuries.

We finally heard a band of music in one of the many charming parks in which we took a walk. It was liberally supplied with seats of stone and masonry under grand old shade trees, and with the perfume of flowering shrubs and plants, the tinkling waters of the fountains and strains of sweet Mexican music. It is little wonder that the entire population turns out of an evening to enjoy the music and talk over the happenings of the day, for they are a social and music-loving people.

Written for the CLAY-WORKER.

AMONG THE BRICKMAKERS OF PHILADELPHIA AND VICINITY.



WHATEVER MAY BE said condemnatory to the weather conditions of the past two months, one can but admit that after all there are certain compensations to be found in a brickyard, even where the sun is sizzling near the century mark and you feel dry and hot internally and externally, your condition can only be likened unto a hot steam bath. Then comes the accepted time, stand between two brick stacks running north and south, and if there is air enough to fill a wine glass you'll get it; and will feel its refreshing influence for an hour or two, or stand near the tempering machines, under the shed and in the shade, the change from the hot glaring roads makes it seem a paradise. The plunk, plunk of each shovelfull making up the barrow load causes a sense of coolness to creep up the lee side of your spinal column.

The weather of the past three days has been invigorating, and I am starting out with a light knapsack, consisting of camera, comb, tooth brush, and in case it rains a night suit. My first stopping place is

—Frank and Thomas McAvoy's Brick Plant.—

Located at 33rd and Dickinson streets. They are not the Tom and Frank McAvoy so well known to the members of the N. B. M. A., and of whom frequent mention is made in these columns, but are relations, and like them are far from being pigmies. Tall and broad of girth, they possess the same kind of physical "make-up" as the others. The plant, extending over some 15 acres, was started in '88, with a good yield of blue plastic clay, non-shaley and running deep, already some 18 feet and right close up to the machine, being hauled from the pit, dumped on the elevator into the disintegrator, thence to the pug mill and machine. One large Chambers' machine turning out about 60,000 daily, together with the three hand gangs, give them an output every year of about eight million hard, salmon, stretcher and paving brick. Of repress they turn out about 3,000 daily, drying with sun and wind, or as one man quaintly put it, "One eye and a cold breath." Five up-draft kilns of 190,000 capacity a 70 horse-power engine and a 70 horse-power boiler makes the outfit of the yard in which they keep nearly 80 men going during the season, from April to November. The McAvoy's are all hustlers, and these two, Frank and Thomas, like their cousins at Perkiomen, know how to make brick, and, what is better, where to place them.

Nearby is the old-time yard of

—Lloyd & Russell's.—

But for the unfriendly tilt between Uncle Sam and Alphonso, the Sickly, this plant would have ere this passed out of existence. As it is its days are numbered, and already the finger mark of the real estate agent guides the public to the fact that "this land will be sold in building lots." Mr. Russell has been dead for several years, but Mr. Lloyd, Sr., and his son

Walter, have scraped over the eleven acres, until to-day scarcely a load is left to feed the machine. Three or four hand gangs are working in a desultory manner, and will continue to do so until the fall, when they will close down, and the machines and four kilns will be dismantled. So, taking a snap shot at the best looking hand gang, I bid them a sorrowful farewell.

—Brickmakers' Worries.—

A pipe and a friendly chat brought forth the expressions of discontent from one man, suggested, I suppose, by my remark that "business generally ought to be good considering the number of two and three-story houses going up around them." "Yes, but I'll tell you the trouble with the brickmaking business to-day is, that them fellows living over on the other side of the city, come right in and deliver their goods for less money than I can make them. Explain that to me," he said. I couldn't, except it was by reason of larger production. "No, it ain't that," he said, "them fellows just put them in at 70 per cent. cash and somebody else goes hungry for the 30 per cent. owing. I tell you it comes out of the working man's pocket, that's what it does." And by way of illustrating the method he enlarged upon the evils of monopolists and large apartment stores and like money makers who buy goods from the manufacturer



"The Best Looking Hand Gang."

at a discount of 40 per cent. and pretend to sell them at greatly reduced rates. "Why," he continued, "that don't come out of the bosses' pocket—it comes out of the workingman's pocket. He goes back and puts them to work at reduced wages. If a man comes to me and he hasn't got the money, he's not going to get my brick. I want the money or pretty good security, and lots of these fellows haven't got any security. No, sir, there 'aint any money in the brickmaking business any more. I'm a singleman, but I'll tell you, if I had a wife and she went to one of them apartment stores, I'd knock the insides out of her driving horse," and with this he picked up a stone and threw it with such force that if it hadn't landed against a post, I verily believe it might have reached the State line.

—At Wilmington, Delaware Co.—

After a 26 mile ride on the boat, during which I had the pleasure of seeing the cruisers Columbia, Minnesota, Arctic and others in their sombre war garb of lead color, lying peacefully at anchor at League Island, I entered this city, made famous by the memories of the Brandy Wine in the war of 1812. I boarded a River View car and made my way out to the works of the

—Delaware Terre Cotta Co.—

Situated in the eastern suburb of the city. Here I was met by Sam Lewis, superintendent and servitor of the company for 33 years. "Business is but fair," he said. "I have seen the

time when we turned out our ten million brick during the year; now we are making only between four and five million annually. We have two great obstacles to contend with. First, there is not much building going on; and secondly, Baltimore brick and prices enter largely into competition. This being the old yard, the clay has given out, and soon we will close up here and go over to the other yard lower down. We have two, this one covers about 25 acres, and I guess I can show you as pretty a kiln (our last burning) as ever you saw." And they were very good.

The plant consist of two twelve-arch and two ten-arch up-draft kilns, one Chambers machine, turning out about 40,000 daily, and three hand gangs. The clay is hauled up from the pit, put on the belt and carried through the two Penfield rollers. The motor power being supplied by a 60 horse-power engine and two boilers of 60 horse-power each. All the drying is done by Dame Nature. In the lower yard, located at 25th and Claymont streets, they have a Penfield machine, and work quietly along, turning out about 20,000 a day. Jas. H. Beggs is the president; J. H. Beggs, Jr., is vice-president; S. W. Almond, secretary, and J. P. Almond, treasurer, with a pay roll numbering near 60 men. This plant is looked upon by Wilmingtonians as the boss yard. Patience and the city's growing wealth and population will give them their dues.

Ambeys Bros., Allens and J. Obrays are all down on my note book, but for want of space will reserve them for another issue.

W. P. Lockington.

MINERALOGISTS MAKE A DISCOVERY.

While studying the habitat of the common Jersey brick, mineralogists believe they have made an important discovery in the claybanks of Sayreville, N. J. A few days ago a party of them from New York and Philadelphia returned from the clay fields with the announcement that they had discovered spear pyrites of the marcasite variety imbeded in clay of either the cretaceous or the jurassic period. Spear pyrites are said to have been found only on the other side of the Atlantic, and mineralogists generally believed that they did not exist in America.

BUFF CLAY WANTED.

An extensive manufacturer of clay ware desires to purchase a large bed of first-class buff clay. Parties having such clay located so as to afford shipping facilities can find a good market by answering "Sculptor's" ad. in want column of this issue.

Written for the CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN.—No. 6.



OUR NEXT SUBJECT for overhauling was the kilns. I do not consider myself an authority on kilns, for I never used any but up-draft, and have seen but few other kinds. Like the subject of drying, the subject of kilns is a very interesting one. I have read everything I can find on the subject of up-draft, down-draft and continuous, but I shall not weary your readers with any of my untried notions. I am very much inclined to believe the continuous kiln to be of the right principle, but I never even saw one. The down-draft may be superior to the up-draft in burning brick of uniform hardness, but I sincerely doubt if they are economical in fuel. This, however, is only opinion, formed from studying the principle of each, for I never use the down-draft kiln. Under the old management of our yard we had used common, "cased-up" kilns, with board roofs kept on until the brick got quite hot at the top; then the roof was removed, and the burning proceeded to the finish. Our orders to the burners were for the roofs to be removed at a certain stage of burning, but they were not always obeyed. On different occasions we had enough lumber burned to pay for the building of a good kiln, with permanent walls well laid in good mortar and arched over with a permanent brick roof. Besides, the time required to case up a common kiln is a very considerable item of expense. And the amount of rubbish it occasions in being torn down and rebuilt is harrowing to the soul of a man that likes to see things done in decency and in order. Some men may make good burns in the "cased-up" kilns, but I never saw one that would pass for a good burn, when compared with the burns made in good, substantial kilns. There was always a great deal of "salmon" brick around the outside, much of it too soft for any use, while the corners failed often to be changed in color, except by the soot that clung to them. It is reasonable that the poorly constructed wans or casings permit an immense amount of heat to escape in burning, thus keeping the outside of the kiln constantly cooling off, and preventing anything like a good burn of the brick next to the walls, and entailing a great loss from waste of fuel. In building our new kilns we were influenced by the same considerations of cheapness and efficiency



Frank and Thomas McAvoy, Their Office and Works.

that guided us in building our sheds. Our markets were too limited to justify a large outlay of capital, even had we possessed it. What we built we wanted to be substantial and permanent, but it must not cost too much money. Our first kiln was rectangular, sixteen feet by thirty feet, and high enough to admit of bricks being set forty-five feet high and holding 75,000 brick. The walls were substantially built and twenty-four inches thick, the inside work being laid in mud, the outside course in lime mortar. The arched roof was of brick eight inches thick. Of course, this roof had to be held by clamps and guy-rods across the top of kiln. We built on outside furnaces for each arch in the kiln, and fired with wood. There was a door at each end of the kiln, one for barrow, the other wide enough for a wagon. Of course, there had to be several flues in the roof of this kiln so distributed as to give an even draft to the various parts of the kiln. This kiln cost very little more than the time for building it. We had an immense amount of waste material on hand, and most of it could be used in building these thick walls. There was very little salable material used in its construction. Of course, there are owners of fine kilns that may regard ours as of a very inferior plan, and, perhaps, they are right. There is no patent on it, and I have nothing to gain by sounding its praises. But it has done good service for four years with very little repairs, and is good for an indefinite time to come. But, before, I give a full description of our methods of handling the fires in this kiln, and the amount of fuel used per thousand bricks and results obtained, I want to discuss the subject of setting brick in the kiln. The first method of setting brick on our yard was such a prolific source of loss to us that I shall take the pains to describe it in detail. The benches were set three brick, with ends toward the arches, breaking joints each time. The ninth course was a tight course on which to start the overhanging course. There were five of these courses. The first overhanging course was set with bricks about $\frac{5}{8}$ of an inch apart, and overhanging 1 inch. The next course was set upon this, so as to break joints, overhanging about 1 inch. The third, fourth and fifth course were set about the same, always breaking joints or setting each brick over the space between the bricks of the lower course. The fifth brick closed the arch, and next came another tight course. The next four courses above this were set in the same direction, instead of commencing to cross the brick, each time covering the spaces below as at first. After that they were set 3 over 3. One need not be told the result of this method of setting brick. It can be seen at a glance what a tight fire-box it made of the arches and how effectually the heat would be held there in spite of its inclination to go upward. The effect upon watersmoking was disastrous and not less so upon the burning. Our water-smoking was always in spots and long delays were caused trying to dry off those "cold spots." Our clay was very difficult to dry off without damaging at best but it was simply impossible to do it properly with such methods of setting brick. There were a few spots dried off in good shape in reasonable time, but there were always several patches of broad territory to be reached by harder and harder firing, until some places would be at a good red heat, while the steam would be coming off at other places. Now this may have been the fault of our superannuated burners, and I rather think such was the case in part. But I know even the best of burners could not have made a success under such circumstances. When our kiln was cooled off we found the spots where the water-smoke first came off badly melted, warped and stuck together. The cold spots were sometimes a poor salmon, sometimes badly white-washed, but at all times unsound, and shaly in structure. Between these spots we sometimes had some good brick. Our arch brick were always badly warped and stuck together, while the number of broken brick throughout the whole kiln was a great source of loss.

So much for one way of brick setting. We readily saw that there must be a change in setting the first 18 courses of brick. Now I have read a great many methods of setting brick in the arches given by writers in the "Clay-Worker." Some of them were good, others better. But on general principles that method is the best which offers the least obstruction to the heat in its upward course. If the heat escapes from the kiln too rapidly, the "damper" should be on the top of the kiln, not in the arches. The arches are simply furnaces in which the heat is formed, but they should give up the heat freely and rapidly. My last statement, perhaps, may be open to criticism, for the heat is not all formed in the arches. Where the arches are properly set we often find our hardest brick—not in the arches, but above the arches for about ten courses. Indeed, we often find our arch brick, excepting the overhangers, good red front brick, only one end in black, while the first ten courses above the arches are thoroughly vitrified, and the rest to the top again good front brick. This shows that much of the gases formed in the arches fails to ignite and give off its heat until it has escaped from the arches and come in contact with the hot bricks above. The change we made in setting the arches were very simple, and yet the effect was wonderful. We set the benches in the old way, but the overhangs were set as follows: The first course the bricks were set $\frac{5}{8}$ of an inch apart. In the second course the bricks were set over the spaces of the bricks below. But in the other courses, the bricks were set directly over the bricks of the lower courses, thus leaving the spaces open for the free escape of the heat. Considerable care is necessary with this method to keep the arches stable so that they will not tumble when raised to a great heat. We closed the arches, and set a tight course directly over the center. Then we set 3 over 3 to the top of the kiln. Later, we made our bricks so thick that we had to set 5 over the length of two in order to give sufficient draft. Be sure to give sufficient draft to your kiln. That is all important. Take any method, skintling, straight or otherwise, but give it the proper draft. If you chance to give too much draft, you can easily "damper" above and produce good results. Insufficient draft will produce "white-wash," "cold spots," "melted arches," unsound brick, and more soft brick than you can dispose of. Regularity of setting is very important. Give an equal amount of draft to the various parts of the kiln, unless it be found necessary to set more loosely around the sides and in the corners. I have set a row of 3 inch tiles around the entire outside of a kiln, and a bunch of them in each corner, and secured very satisfactory results. Of course, the same results may be obtained by setting the bricks loosely. In our kiln with brick roofs, we set to within 4 inches of roof, and put on one course of platting.

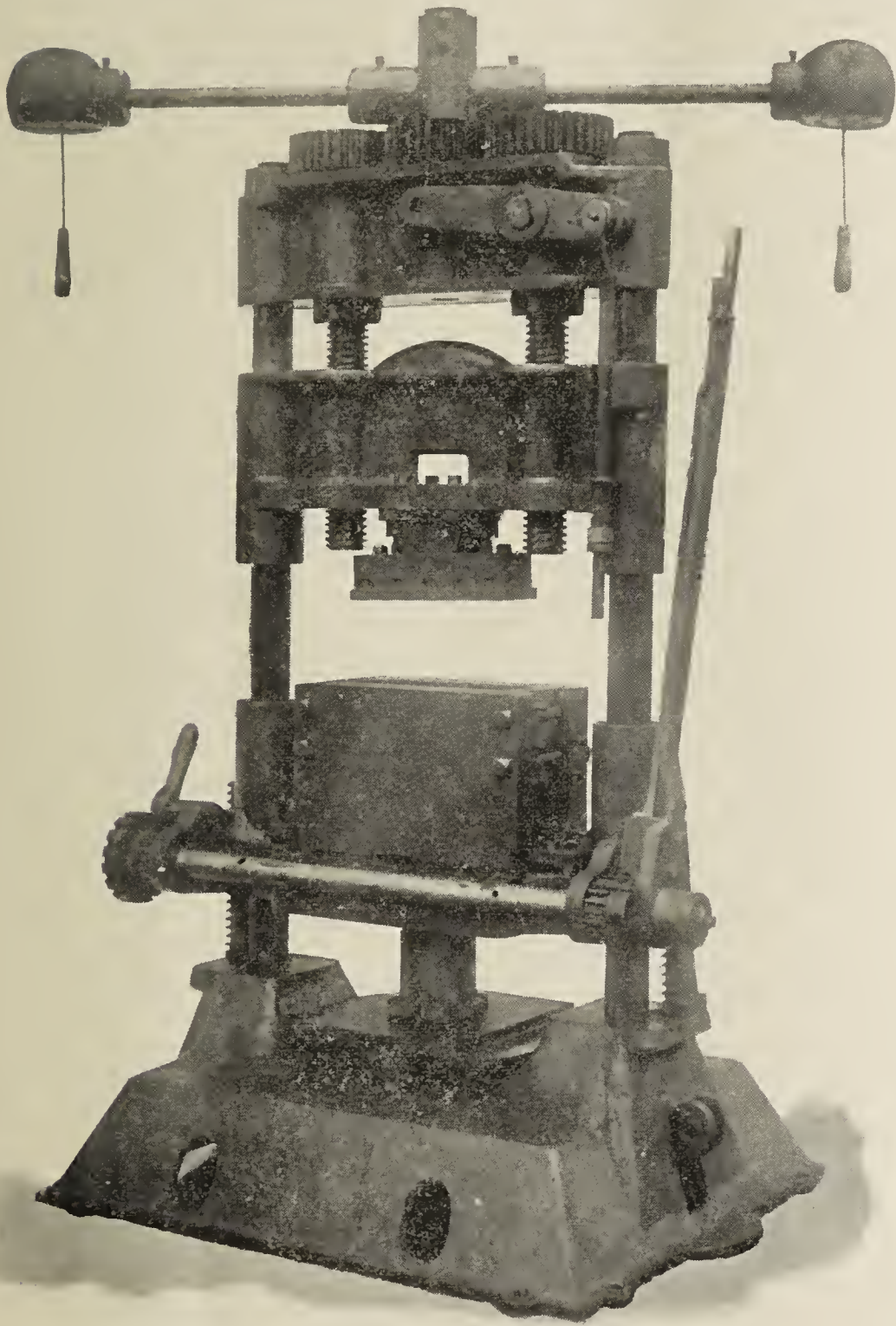
L. C. W.

A GREAT FUEL SAVER.

The Swift slack coal coking-table furnace kiln is briefly described and illustrated in a neat little booklet received from F. E. Swift, Washington, Ia. The book is composed chiefly of testimonial letters from well-known brick, tile and pottery firms who have adopted the Swift furnace to their own material advantage. We notice among the number a letter from the Marion (Ind.) Brick Co., stating that they consider the Swift furnace "one of the greatest inventions of modern times." Inasmuch as they are operating two large building brick plants, each having a daily capacity of nearly 100,000, one using natural gas, the cheapest of all fuels, so long as it lasts, and the other the Swift furnace kilns, their testimony is valuable. Their assistant general manager, F. W. Butterworth, states that they are burning their brick at the new Montezuma plant with slack as well and as cheap as they can at the old plant at Marion with gas. This coincides with the testimony of other brickmakers in this vicinity who have adopted the same process, and by the use of slack are competing with the yards in the gas belt. Those of our readers who are interested will find a cut of the Swift kiln on page 219. A copy of the booklet can be obtained on application to Mr. Swift.

A HAND RE-PRESS.

WE ARE ALWAYS GLAD to inform our readers of any success that may have been achieved by friends in any departments of the clayworking industry, and especially so when they have used this paper liberally as an advertising medium, for in that event we feel that we have been instrumental, in a way, in assisting them to build up their business. While the above remarks apply to all of our friends and patrons, we are at present referring especially to the Ohio Ceramic Engineering Co., of Cleveland. This firm has gradually increased its business until about two months ago they found that the capacity of their shop, located on Center street,



in Cleveland, was completely overtaxed, and that, in order to carry on the business with the promptness of service which they always endeavored to give, it would be necessary to secure much larger quarters. After having come to this conclusion, Mr. Robinson, the president of the company, at once began to seek a suitable location, and this was no easy task, for, although Cleveland is filled with manufacturing buildings, there are very few of them vacant, which certainly speaks volumes for the solidness of the manufacturing interests there. After some weeks of investigation, however, Mr. Robinson finally secured a building which was formerly used by a large manufacturer of iron work, located on Fall street, near Leonard.

The capacity of the concern will be much larger now than it has been, and their facilities for turning out work promptly and well will be greatly improved. We congratulate them upon the change, and wish them continued and increased success.

In his letter to us, informing us of the change of location mentioned above, Mr. Robinson mentions another hand repress, for pressing ornamental brick, that has just been designed and built by Mr. Holl, the manager of the company. An illustration of the press was sent to us, and we reproduce it herewith for the benefit of our readers. It is certainly a very novel machine, and one we believe will interest brickmakers throughout the country. It is probable that any manufacturer can recognize the merits of the machine by carefully looking over the accompanying illustration. In order to assist them, however, in understanding the workings of the machine, we simply say that the principal points of superiority claimed for it are, first, that it will make brick with ornaments either on the end or side, or the edge, which is a very valuable feature indeed, and has, as far as we know, never been accomplished before.

Second. The brick are made of even thickness throughout by reason of two screws, thus securing an equal pressure on all parts of the brick.

Third. The machine gives top and bottom pressure.

Fourth. All brick are made uniform, because of automatic stop.

Fifth. The machine is adapted for making key brick.

Sixth. It is very simple of operation, and very powerful, and is, therefore, practical, inasmuch as it does its work well, without constantly getting out of working order.

Seventh. Its capacity is greater than that of any other similar machine made.

The Ohio Ceramic Engineering Co. are prepared to give any required information to interested parties, and will be very glad to hear from you in regard to the matter.

CLAYWORKERS AT THE ILLINOIS STATE FAIR.

THE STATE FAIR at Springfield, Ill., Sept. 26 to Oct. 1, is supposed to represent the products of our State in every branch of industry. The products of the farm, home and factory are to be found there in their Sunday dresses, ready for the ribbons which designate the winner. It is a laudable enterprise, fulfilling its destiny, no doubt, by encouraging better results and showing to the growing generation the benefits of cultivation and the necessity of combining the work of the mind with the work of the hand.

Surely the clayworker comes as near as the farmer in making two blades of grass grow where only one grew before. With us the really valueless clay—dirt that will hardly grow beans—is made into merchantable products that are not only of value, but are daily becoming more and more necessary. The short-lived wooden buildings are doomed, and are to-day ranked as lower grade in city classifications. With increasing cheapness of structural iron and steel and adaptation of machinery to the making of clay products in all shapes, it is only a question of short time till the only obstacle—first cost—is overcome. Buildings alone cover not the scope of our products, but in all branches of man's needs are found places where the clayworker can and will assert his presence and importance.

That the word importance is not used boastfully, remember statistics show the total value of clay products of Illinois for 1895 was over seven million dollars, and that she was third in rank of all the States.

This brings me to a starting point. Our products have not been represented at the State Fair in such a manner as to fully represent our great industry. An effort is now being made

whereby our work and its results can be seen and appreciated. To do this effectually requires the concerted action of each and every one interested. The pavillion belonging to the State Association that did service at the World's Fair will be placed in the manufacturers' building as headquarters for clayworkers.

Nothing definite can be said at this writing of the concessions from the State Fair officials to the clayworkers, only that the assurance has been given us that room would be granted and everything possible done to assist the enterprise.

For information, correspond with our secretary, G. C. Stoll, of Wheaton, Ill., who will be ready to give all information in a few days.

H. F. TOWNSEND,

President Illinois Clayworkers' Association.

THE NEW YORK MARKET.

—The Strike at Haverstraw.—



IN THE LAST TWO numbers of the Clay-Worker mention has been made of the strike on the yards at Haverstraw and Grassy Point, generally called Haverstraw. To many of the readers of this journal it has been a matter of but little thought, no doubt, and they have said to themselves it is only a brickyard strike, and will soon regulate itself. So did those directly connected, and I have not the least doubt that all the married men who work on the yards thought the same, or they would not have been so quick to join the Knights of Labor. I say the married men. Many of them have grown old since the time they placed foot in this country and began work on the yards in that place. The children of these men have grown up and married and settled down to the long hours and short seasons of brickmaking for a livelihood, small as it is.

As a body, the employes and employers in the brick trade are about in the same boat, when they try to form a combination to help themselves; too many ideas of what will benefit them; ask for one thing and demand several.

The present movement was engineered in Haverstraw, but the "power behind it" comes from that source in New York City which has been completely beaten by the builders, the "walking delegate." The brickyards was the field in which they no doubt thought they could command the situation, and without a doubt they could. It shows that the movement was well planned, and the largest field, Haverstraw, was chosen. Why? Simply because the yards are close together and the men can easily be controlled, as has been seen in the past ten weeks. Control the output at that place, and all other yards from Sandy Hook to Albany on the Hudson and Greenport on Long Island would be under the domination of the Knights of Labor, and the building material men and builders would be as clay in their hands. Beyond doubt it is a movement, not of the men, but of a class of men who are forever studying some plan to do less work and get more wages. He has in the past three years been downed by concerted action on the part of the contractors. I say "he," because there is one supreme head who governs the board.

—The Demands of the Men—

On all the yards in Haverstraw for a reduction to 20,000 to each pit was strange, in that, so far as I can learn, it would not in any way help his pocket. To the workmen there was no benefit at all, financially, and in the way of labor only an hour or more less work. In times past nothing but "more money" was the cry; in this case it would, if complied with, tend to help the boss, as less production would mean less brick; less brick, better prices. How thoughtful he was of his employer's interests!

Compliance with the demand, as near as they could, by eleven yards, was the result. When the pits were on the yard they were counted, and all over the 20,000 to each pit was walked through and rendered unfit to set.

The next move showed that the call for only 20,000 was but a move to feel the temper of the boss. As they did not fall over one another to respond to the demand of the men, the next demand came from the men as "Knights of Labor," 20,000 brick to a pit and 10 per cent. advance in wages, with a walking delegate thrown in, which resulted in a complete lockout on all yards.

How long will it last, was the question. The men were sure that their demand would be conceded in a day or two—and today, the last day of August, they are still waiting. The boss said nothing, but has done some hard thinking. What will this lead to? They were face to face with one of the most momentous events in the history of the trade. For once they were as one. This matter must be met.

—An Organization of All Bosses—

Was formed, with the result that all agreed to resist the demand, and they held together. But there are always some who will go back on their word, even if it does injure others, if there is a chance of it being a slight benefit to them. Two were found who had agreed to the terms, and only two. From an unlooked-for quarter they were taught that "there were others" interested in the strike—the commission man and the buyer. The former refused to handle their stock, the latter to buy it.

Help was offered at this time by the other brickmakers along the river and New Jersey saying your enforced idleness is to our benefit, and we agree to contribute to the payment of the rent on those yards which are under leases. Light out of darkness to many. No signs of giving in by either side; just simply a lockout. How long will it continue? Weeks have passed. Meetings were held to strengthen the men; the "delegates," one colored and the other white, harangued them.

Another Moses appears to lead the children of labor into a peaceful settlement of the existing trouble. The parish priest came out and called his people together, and he would counsel with them, and in this wise he spoke, or at least he is so reported that if the men would call 22,000 to a pit instead of 20,000, and no more wages than was paid on June 15, they could go to work. It had no effect. There is not one among the manufacturers who will admit giving the priest any authority to speak for him, and those at the head of the organization say that he was not authorized to speak for them. The priest went away from home, and on his return was surprised that the men were not working. He then accused the bosses of breaking faith with him, and told his parishioners not to go to work, but to go to the poor-houses.

—Started to Mold.—

If any who professed to want work were given a trial under a guard of men sworn in by the sheriff, they were intimidated by the strikers, who carried Winchester rifles to enforce their demands. Messrs. Washburn, Fowler & Co. called on the sheriff for protection, and, by the help of eighty deputies to guard one machine gang of fourteen men, they started, and have kept at it, and at present time are running four machines. A proposition came from the men on the 22,000 basis, but was not accepted.

Advice given to the men by the priest on Sunday, August 14. I give his words as taken from one of the Haverstraw papers: "During the past week I have made an effort to bring the strike to a close. I had heard it said that if the strikers would go back where they left off, after a week the bosses would make concessions. I started out to ascertain the truth of that statement, and invited Mr. Redmond to call on Mr. Peck for that purpose. When Mr. Peck denied that such ar-

rangements had been made, and further stated that the men must go to work where they left off, I then sent for a prominent brickmaker, a member of my church, and tried to get him to recede from his position with the brickmakers. I talked with him for over an hour. His difficulty was in breaking faith with the manufacturers and a fear he was certain of that his rent would be demanded forthwith. He was in favor of holding out, and was afraid to recede. I offered him \$500 to recede and agree to 22,000 as the output. A long pause followed, and he would not say yes or no, but asked for further time. I urged him on in the name of God, but he was obstinate, and agreed to meet me on Sunday. He did not meet me, but sent a note stating that he would not make brick for a few days. I thought if I could get him to yield, I could get two others to do likewise, and finally others would fall in line." The priest then told how he was innocently drawn into the strike question. He referred to his former meeting with the strikers, and to his statement that if the men would withdraw from the Knights of Labor, abolish schedule of prices and go to work on a 22,000 basis they could go to work, in which he was disappointed. Nothing now will please the manufacturers except the men go back to the old rate. Continuing, he said: "There have been nine weeks of idleness, after a long winter of idleness. The past week more desperate means have been adopted by the brick bosses ordering the men from their houses, which they have a right to do. Some of the strikers maintain that the bosses could not oust them, but they can, unless the property is leased. Even the man who occupies the same house year after year, who has his rent deducted from his wages, can be put out. If the order to vacate is not obeyed in three days, they can put the belongings out on the street. A still more serious condition prevails. The store-keepers, I am told, have refused credit all along the line. They have been lenient in carrying the men through last winter, but the end must come. Then how are you going to get bread for your wife and children? Under such conditions, what are you going to do? As to conditions, I would not yield to them. If a single man I would go away and seek employment elsewhere; but we have other conditions. A single man is not obliged to go back; but, suppose your position was reversed, and you were a married man. (A question he had put to a single man during the week.) What would you do? Nature prompted him to say, 'I would not see my wife and child go hungry.' I won't say to you to go back, and I won't say not to go back. I would not be responsible, and to-day I am going to throw away all responsibility."

He then asked if any one had anything to say. No one responded. He then asked those who wanted to hold out to stand up. About all in the church responded. "How many of you are able to hold out?" he asked, which was responded to by a large number. "Remember," the speaker continued, "it is galling to go back. From this pulpit I told you not to go back, but to go to the poor-house. When I made that remark I did not anticipate such mulishness on the part of the brickmaker. I don't think there is a priest who lives to-day who would do what I have done to bring this strike to a close, and I am still willing to give \$1,000 to aid your families, but that won't go far. Many of you will go back. I will say it is better for you all to go back in a body, instead of some one day and some another. The single men need never go back, but the circumstances surrounding the married men are different. We must take much in consideration. I know many who are ready to go back, and you had better all go, than a few on Monday and a few on Tuesday. I firmly believe that next spring the bosses, united as they are, will come together and arrange on an output. As it is now, the Up-River yards, Hackensack and Staten Island bosses have cornered Haverstraw, and will give them money to keep the strike up. There lies the whole difficulty. You are not fighting Haverstraw alone, but Up-River, Hackensack and Staten Island. You are fighting thousands of dollars, when you have nothing to fight with. If you had laborers on the Up-River, Hackensack and Staten Island yards with you, you would stand a chance. There are ten men to take the place of one. This is one of the evils of labor. I am told that Haverstraw will be swamped next season with Italians. Taking everything into consideration, I would say go back. In looking over the past nine weeks I see mistakes. The strike was begun wildly and continued wildly. It was a great deal to ask

a man to come down to 20,000 and to ask for more wages. You might better have made the demand on the output or wages, not both." He then again invited any to speak, but no one responded. When he stated that \$1,000 would not go far, "a long winter is before you," he said, "and you may not have a dollar. If no brick are made there will be no boats to load next winter." In conclusion he asked his hearers to weigh well all he had said, and, having weighed his words, to use their best judgment.

—The Strike Declared Off.—

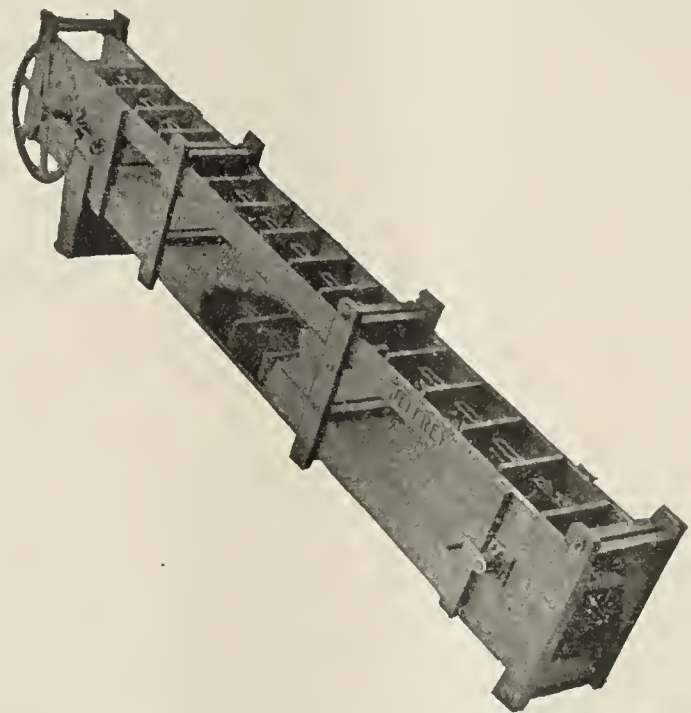
August 25 the strike was declared off by the Knights of Labor, but to-day the same conditions exist. Armed men guard the yards night and day. And a day or so ago Huns were brought from New York to work, and were guarded. Report is that they were fired on by the strikers when they went to work, and the end is not yet.

A. N. OLDTIMER.

Hackensack, 8-31-98.

PORTABLE CHAIN ELEVATORS.

THE TWO TYPES of elevator shown herewith are such as have proven highly satisfactory in the lines of work for which they are designed. The bucket elevator is one of the practical types of elevators for handling broken or crushed stone, while the other form is an endless trough elevator specially desirable as a drainage and irrigating pump.



Detailed descriptions of these elevators are almost needless, for the reason that the illustrations show the simplicity of their construction.

Briefly described, the stone elevator is made of single chain,

with special stone buckets operating on suitable sheaves, and in operation the material to be handled is fed direct into the buckets.

The water elevator is of the chain-pump principle, the chain being provided with suitable wooden flights, the carrying sides of which travel through a closed box, and, as the lower end of the elevator is submerged into the water, the chain and flights carry practically a stream of water the full size of the box.

The illustrations above are simply two forms of this class of elevators, which can be adapted to the various conditions and requirements.

By addressing the manufacturers, The Jeffrey Manufacturing Company, of Columbus, O., interested parties can get full data and catalogues.





THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Which is the Best Dryer?

Editor Clay-Worker:

Replying to inquiry of "Charter Subscriber," in August Clay-Worker, as to drying brick on hot floor, financially compared with drying them under shed with rack and pallet system, I should say, without hesitation, that the latter system should have the advantage of at least one dollar per M.

"Charter Subscriber" can readily figure the cost of wood for the twenty-four hours and fireman day and night into about one-fourth of the brick he has on the floor and he gets the exact cost. I have found that only a very weak, porous clay can be dried with any success on a dry floor. Then his brick will not be as smooth as those dried in his racks and pallets, as they have to be handled more. To build the dry floor would also cost more money than the sheds. Have had the experience; better spend money on a steam dryer, and would suggest that he correspond with some of the dryer firms who advertise in the Clay-worker. I am using a Standard dryer, and am satisfied with it. Am confident it is the most economical system of drying, especially for large plants. I could not afford to go back to the old system of out-door drying. A. REEVE.

Sept. 12, 1898.

Another View.

Dear Clay-Worker:

In regard to the inquiry of Charter Subscriber, in the August issue, asking which is the best dryer for burning soft-mud brick, I have no hesitation in saying that, in my opinion, the rack and pallet system is the thing for him or any one else making soft-mud brick. This system gives the best possible labor in handling, especially as compared with the hot floor. It is superior to this in absolute freedom from "finger marks." But, let it be understood, that I do not approve of the rack system, which has been very much used, where the loaded pallet rests at the two ends on transverse cleats. This is a clumsy, awkward arrangement. The pallets resting at their extreme ends on cleats will sag more or less in the middle, besides the greater time and inconvenience in putting the pallets in the racks. Each pallet containing six soft-mud brick should rest on two pickets eighteen inches apart. Ordinarily four-foot fence pickets should be used, securely nailed to 2 by 6 center posts. The pickets will, therefore, extend 21 inches on either side of the posts, and receive two pallets on each side, so that every two pickets will receive four pallets containing six brick each. For ease and convenience in filling racks, not more than nine tiers of pallets should be used. Every two center posts would, therefore, receive thirty-six pallets, containing 216 brick. But this is, perhaps, a little foreign to the inquiry of your subscriber. J. K. CALDWELL.

Minneapolis, 9-6-'98.

The Brick Plants of Texas.

Editor Clay-Worker:

I notice in your August issue a communication from S. A. Fishburn, secretary of the Dallas Commercial Club, of Dallas, Tex., calling attention to the advantages of Dallas as a location for a vitrified brick factory. While the object of Mr. Fishburn's letter is a laudable one, he is strangely mistaken when he writes: "There is not a single vitrified brick factory within this large State, nor, so far as I know, not one in an adjoining State or Territory." The mistake has probably arisen from the remarkable increase of Texas industries, which is so rapid as to get beyond the knowledge of even a keen-eyed secretary of

a commercial club. At Thurber, Tex., about one hundred miles west of Dallas, are located the extensive works of the Green & Hunter Brick Company. These comprise, among others, a thoroughly complete, modern plant for the manufacture of vitrified paving brick. The capacity of this plant is 40,000 brick per day, and the machinery is so arranged that the capacity can be doubled on very short notice. There are eight patent down-draft kilns, and a perfect equipment put in by the American Clayworking Company. We are proud of our State, proud of its material progress, and especially sensitive when any one overlooks its brick industry. Respectfully,

Thurber, Tex., Aug. 25, 1898.

JAMES BINGHAM.

Why Not Terra Cotta Monuments?

Editor Clay-Worker:

I have been connected with the clay industry about a year only, yet I find, as many others have, a certain fascination about it that leads me to hope that the balance of my life may be connected with it along some one of its various branches. Now it is in the very prosaic line of fire brick, furnishing little incentive to the artistic side of one's nature. Yet I believe almost every one who molds the plastic stuff into any form has at least a little of the artist brought out in his character. I find myself responsive to every thought artistically expressed in clay.

Your August number compels me to speak of an idea that has been working in my mind for several months. I will not enter into the personal interest in a subject that first suggested it. The memorial panel for Beloit College is the particular incentive at this time. In such reading as I have been able to find in connection with our industry, I never have seen an allusion to it in connection with memorial work, but I can conceive of no reason why our cemeteries should not contain some of the finest examples of the ceramic artists' handiwork.

Every issue of the Clay-Worker notes the passing away of some one who has given the better part of his lifetime to the clay industry, and yet I question if one of them has a memorial recording his virtues, wrought in the material he has been so long familiar with. Instead of calling in the assistance of the stone-cutter and his material, why not mark his last resting place with a characteristic piece made of that which vies with the whitest marble or noblest granite in beauty or enduring grace?

I only offer the suggestion here that somebody may work it out. It proposes, seems to me, possibilities worthy serious attention. Yours, sincerely,

M. J. STONE.

Dry or Semi-Dry?

Editor Clay-Worker:

I rarely take exception to anything our friend Morrison says, and I have read nearly every article he has written for the Clay-Worker during the past fourteen years. In the August number, however, he begins with a statement that is not only not true, but, I believe, ought not to be true, and should not have the authority of your journal.

The term "dry clay process" he says "is obsolete," that it has gone out of use, or is no longer in use; the term "semi-dry process" he thinks having been substituted for it.

First, is this true?

Looking through the columns of the Clay-Worker in which this statement occurs I find the terms "dry press," or "dry-clay" process, in several places, but outside of Mr. Morrison's article I cannot find the term "semi-dry." However, this process is designated as the "dry-clay, or "dry-press" process in all clay journals, American and foreign, as well as in all books upon brickmaking in the English and German languages—including the "Brickmakers' Manual," in which Mr. Morrison speaks of this process as the "dry-clay process," and does not use the term "semi-dry" at all!

No, it surely cannot be true that the term "dry-clay process" is obsolete.

Second. Ought it to be true? Should the compound adjective "semi-dry" take the place of the simple adjective "dry" in describing this process?

None of the terms used to designate the different processes of making brick are accurate. The term "soft-mud" does not convey to one unfamiliar with the process a definite idea of the exact condition that the clay should be in to make a good

brick; but a little practical experience will soon teach him that the clay can be too soft as well as too hard or stiff to be worked well. But would he have succeeded any better if this process had been described to him as the "semi-soft mud process?" Especially also in the making of brick by the stiff-mud or plastic process, the best results are obtained by tempering the clay neither too soft nor too hard,—but would the term "semi-stiff mud" or "semi-plastic" describe the process any more accurately? So, also, in the dry-clay process, the clay can be prepared too dry as well as also too damp to produce the most perfect brick. But the calling of the process "semi-dry," which means, literally, half-dry, or more loosely, partially dry, does not define it any more clearly, nor help one to make a better brick by this process.

No, Mr. Editor, the fact is that the development of the dry-clay process has been just the opposite to that described by Mr. Morrison. One of the chief reasons of our making a better face brick by this process to-day than we did fifteen years ago is that we use clay in a drier condition. The first dry process did not have power enough to make a hard brick out of dry clay, so the clay had to be quite damp, or, as our friend Morrison would say, "semi-dry," in order to form a brick that could be handled without injury and set directly into kiln. If the clay was as dry as we now use it, an attempt to make a hard brick by increasing the pressure, that is by putting more clay into the moulds, soon resulted in a broken press, and repeated experience of this kind—a poor brick or a broken machine—is what cost the pioneers in this process so dearly and caused it to be condemned by all writers upon brickmaking. In the first edition of Davis' "Brick, Tiles and Terra Cotta," published in 1884, the statement is made that "the entire principle of making bricks from dry clay is an error," the reason being that "it is not possible to construct a dry-clay machine that will exert the tremendous pressure necessary without making it too clumsy and expensive." But our machine manufacturers were not deterred by such statements from continuing their efforts to build such presses, and they have been making them successively heavier and more powerful, as well as more perfect in every detail, until to-day these "clumsy and expensive" machines will work clay as dry as the famous hydraulic presses, and make as good brick.

Thus, from making brick from damp clay, the only way possible with the earlier dry presses, and with some that are still in use, we have progressed to the making of a better brick from a drier clay, not absolutely dry, of course, but that looks dry as it goes into the moulds, and which, under heavy pressure, produces a brick that looks dry.

Dry clay, finely pulverized; powerful pressure, repeated once or twice; brick set direct into closed kiln and burned hard—these facts are a brief summary of nearly all I have learned about the dry-clay process of making brick. I haven't the time or inclination, even if I had the ability, to write a scientific treatise upon the subject of the proper percentage of moisture in the clay to make the best brick. Dr. Seger investigated this matter very thoroughly, and the translation of his works into English, which, it seems to me, cannot be delayed much longer, will form the most valuable contribution to the literature of our art in this country that has ever been made—far more valuable than all that has appeared hitherto from any source. I merely wish to record my protest against a term being pronounced obsolete that has been used for so long a time, and is still so universally employed to designate more accurately, it seems to me, than Mr. Morrison's hyphenated substitution, a process that I have studied and practiced for so many years.

W. D. RICHARDSON.

St. Louis Notes.

THERE IS NO particular change in the market since last month. Prices, if anything, are a little lower. It is reported on good authority that one order for merchantable brick was taken for \$3.85 per M. This is the lowest price reached in many years, and there is no apparent remedy unless the manufacturers could get together and establish a minimum price. This, however, is not to be, it seems, owing to the anti-trust laws of the State. These laws, made for the benefit of the community, in some cases operate against the community's interests.

The low prices prevailing will eventually result in another cut in wages or a shut-down of the plants, either of which will be disastrous to the poor man, and the poor man's misfortune is a calamity.

The building permits for August were about the same as

July, and, while the local papers are full of accounts of the general prosperity in jobbing lines, the boom has not struck St. Louis building interests. Bids for four new school houses were opened Saturday, the 10th, and, from the number of contractors in attendance, the inference was that many had no contracts to look after, or they would not have spent two hours in the Board of Education building on a fine Saturday afternoon. In this connection I may say that, under the supervision of Mr. W. B. Ittner, architect, the present Building Commission of the School Board, St. Louis is getting the best of school buildings, which are being made fire-proof and equipped with all the latest improvements in the way of ventilating devices and sanitary appliances. The best part of the story to the taxpayers is that they are not costing any more per room than the old-style, poorly-ventilated fire-trap, which we used to build under the old board.

While St. Louis local interests in the building line are dull, the outside trade still shows signs of life, and the territory is extending. Evens & Howard Fire Brick Co. report an order for twelve car-loads of buff Roman mottled brick for Spokane, Wash. The freight rate is equivalent to \$37 per M. This, added to the cost of the brick, would seem an expensive luxury, but when a man in the far West wants a particular shade of brick for the exterior of his house a few hundred dollars extra will not deter him from getting what he wants. 'Tis a pity we do not have more of that class of men in the middle West.

The Illinois Hydraulic Press Brick Co. are now running without difficulty. The strikers' places were filled, and some of the better men have been taken back, but most of the old men have had to seek other fields or brickyards.

The American Hydraulic Co. are now ready to start, and they will be making brick before this issue of the Clay-Worker is in the hands of its readers.

Anthony Ittner is running with gradually increasing efficiency of his force as the new men become used to the work.

Money is plentiful, and can be had on good security at 5 per cent. On large loans 4½, and some say, on exceptional security, it can be obtained at 4 per cent.

It is to be hoped that, with cheap money and cheap material, speculators and builders will find it to their interest to buy some cheap brick and help our friends along.. A SAINT.

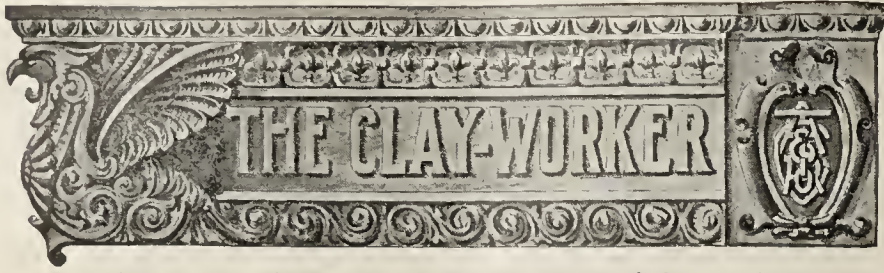
Sept. 12, 1898.

WHY MR. HENSLEY LOOKS PLEASANT.

The well-known Hoosier representative of the "Quaker" and "Monarch" brick machines, Mr. Jas. W. Hensley, of Indianapolis, is looking very pleasant these days, as the reader may see by turning to page 195, on which his genial face is pictured. Mr. Hensley is much pleased with his summer's business, which has been very satisfactory. He recently received an order from far-off South Africa for a complete "Monarch" outfit accompanied by a draft covering the cost of same. Another gratifying feature of the order was the precise manner in which the purchaser mentioned the Clay-Worker, giving the number of the page on which he saw Mr. Hensley's ad. The latter has recently booked other good orders, including one for a "Monarch" equipment for John J. Johnson, whose brickyard at Castleton was burned last month, also a similar outfit for A. O. Koontz, South Bend, including molds, sander, etc., and a horse-power equipment for W. D. Westbrook, Indian Mound, La. Mr. Hensley considers the trade outlook very bright, and is correspondingly happy.

THE BATTENFELD-MORGAN CO.

We introduce to our readers, on page 243 of this issue, the new firm of Battenfeld-Morgan Co., of Cleveland, O., who, in addition to the machinery illustrated on that page, offer the trade a full line of up-to-date brick and tile machinery, including pug mills, clay crushers, cutting tables, represses, etc. The members of the new firm are by no means strangers to the clayworkers of the United States, having been previously engaged in the manufacture of brick and tile machinery. They are thoroughly acquainted with the needs of the trade, and well equipped to meet them. They have recently purchased the shops and good will of J. N. Kaufholtz, for many years proprietor and manager of the Central Machine Works of Cleveland. The Battenfeld-Morgan Co. will be pleased to tell the readers of the Clay-Worker all about their machinery, and will gladly send illustrated catalogue to all who will send them their address.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXX.

SEPTEMBER, 1898.

No 3.

CURRENT COMMENT.

Really good men are scarce at Haverstraw, remarks our Eastern correspondent. Really good men are scarce everywhere and at all times. Hence there is always room at the top.

* * *

If the young men who compose the class of ceramics in Prof. Orton's school for clayworkers will bear this in mind and equip themselves thoroughly, both practically and theoretically, none of them will have to hunt for a job; the job will hunt them.

* * *

The men who can mix brains with their clay, who understand the whys and wherefores of the brick business, who have the energy and force of character to command and direct in affairs entrusted to them, have no trouble to secure remunerative positions. Such men are in demand, and always will be.

* * *

The manager of a large brick plant said to us recently: "I want a good man at the works, a man who can meet the emergencies that are always liable to occur, without special instructions. My foreman is all right so long as things run smooth, but let anything happen out of the ordinary and he lays down and waits for me. I can't always run to the works at a moment's notice, and must find a really good man."

* * *

Another manager complained of being swindled by his men in the matter of counting the cars of clay delivered. He paid a fixed price per carload of clay delivered, and one day discovered that the count had been run up on him from ten to twenty per cent. He is now arranging to put in an automatic counter which registers each car as it passes into the building. This will be a check and safeguard if the men are honest, otherwise it may offer only a fancied security.

* * *

A correspondent puts the question, "Why not terra cotta monuments?" There is no reason. Terra cotta monuments

that were made ages ago are still in evidence. The ancients made them, some of which have withstood the ravages of time better than those of stone. We are told there are good examples in the Louvre, and fine brick and terra cotta statues may be seen in the public squares of Berlin and other European cities. No monuments are more artistic and none so indestructible as those of terra cotta. It rests with the American clayworkers to introduce and create a demand for them.

* * *

W. D. Gates, president of the American Terra Cotta and Ceramic Co., Chicago, writes, that two of the old employes of of his company who died "in the service" have terra cotta monuments over their graves. Nothing could be more appropriate than that the final resting place of a clay worker should be marked by a monument made of clay.

BUSINESS.

There is no doubt that we are riding on a wave of prosperity. General business is good. It is increasingly good. The war prevented some building in the coast cities, and in some of the western cities general conservatism, as the result of too much building within recent years and poor business in the past, reduced the amount of building. Now, however, capital is seeking investment. There is more money offered than can find use, excepting at very low rates of interest. Four per cent. money is by no means uncommon in this section now. This will make building good. People cannot get the large returns on their money that they once did. This is generally realized. The ten per cent. business investment has gone glimmering. Foreign capital is rushing into this country in purchase of our securities. All this augurs well for general business and clayworkers' business in the future.

COST OF TERRA COTTA AND STONE.

At one time terra cotta had decidedly the call on stone as to cost. Almost always terra cotta was the cheaper. Recently bids were opened in this city on a building where both stone and terra cotta were figured. The result was largely in favor of the stone. There were two good reasons for this. In the first place, large numbers of quarries have been developed, and experience of dull times not only has led to economy in quarry methods, but has habituated quarry men to lower prices. Furthermore, competition has developed stone-cutting machinery so that when it comes to plain molded or turned work, or when a great variety of patterns is used, stone is a dangerous competitor in this section. In a tall office building recently let, in which there was quite a large amount of decorative work, the stone and terra cotta bids ran about the same. This was owing to the fact that all of the molded work and some of the decorative work could be cut on the lathe.

VENEER HOUSES.

Even in this country, where brick are so cheap, one frequently sees veneered houses being constructed. There is no possible excuse for this from any standpoint. Even in the matter of first cost there is no economy, and certainly there is no other material consideration. In certain sections of the world, where clay is scarce and brick is dear, the veneered house comes in very properly, but this condition rarely exists. There is really no economy in building veneered structures in this part of the world. Such houses are frequently built because some one thinks they are cheaper, and has not taken the trouble to investigate. Often there arises the question of dampness, but in a modern-made house built of hard brick, who has observed dampness? A damp house is one of the bugaboos which died with fish-worm brick. In the days when they

did not burn brick hard enough to destroy the insects and animal life which the brick contained, damp houses were not to be wondered at. That period has passed long since.

THE HOME-COMING SOLDIER.

Some regiments of our soldiers are coming home to be mustered out. Apparently the war is so nearly over that they will not all be needed longer, though some of them will be retained for awhile, until we get adjusted to our new conditions and our new conditions to us. At the beginning there was much rivalry among the volunteers as to who should be first to go to the front; now it seems to be who shall get home first. The novelty of camp life has worn off, and they have seen enough of Cuba and "Rico," though most of them have seen neither. When, a few months ago, our local troops went through our streets to take the train for the front, their step was elastic, their soldier clothes were new, and every face seemed to be singing:

"It's for to fight the enemy
We're going for to go."

Those who have returned look camp-worn, if not war-worn, their uniforms are soiled and their step is less elastic than it was, while their countenances sing:

"We might have made our lives sublime
If we'd not had to fight
Pesky microbes all the time."

This comes from a viciated notion that it is less heroic to fight microbes than to face bullets, and less glorious to die of them than of these. This is all wrong.

A NEW ENEMY.

Speaking of microbes reminds us that our revolutionary fathers, nor the soldiers of the war for the Union, never had to meet this enemy. Except bullets they had no dangers but camp fevers, camp diarrhoea, forced marches and short rations. Now these, young soldiers have encountered microbes, from the day they left home, in everything they had to eat or drink or wear; the cars were full of them, and the steam boats, and the ground they slept on, especially at Tampa and Chickamauga, and the statistics, when the reports are all in, and those now tusseling with this enemy, are all heard from, will probably show that three times as many have died of microbes as of bullets. In the war for the Union about three and a half as many died of army diseases of one kind or another as died of bullets, but that was inevitable. It has been so in all great wars the last half century, some of them going as high as five to one, but there was not a microbe in all of them. He, she or it, the microbe is an invention, like smokeless powder, of a late date, a substitute, as it were, for all the diseases and discomforts of camp life as it used to be. Though the inevitable results are practically the same in all armies, the coming of the microbe has given occasion for a class of sensational papers to make trouble for those who heed their vaporings.

THE YELLOW JOURNAL.

It is a disgrace to our civilization that there are men base enough to traffic on calamity. Sickness in camp is inevitable. Exposure brings sickness at home, and, under most skillful nursing, death often follows. Army life means exposure to many uncomfortable conditions, and army hospitals cannot furnish the tender nursings that the average American home can, and it is not unnatural that a sick boy in camp should write to his mother how much he misses her attention, but that any

sane editor should parade these facts under startling headlines so as to give the impression that soldier life in an American army is too horrible to be tolerated, is not only a disgrace to the nation, but it is damaging. Speaking only for Indiana, which three months ago could have furnished fifty regiments in fifty days if the call had been made for them, we doubt if one regiment could now be mustered in a month, under any stress except the draft, and yet nothing has transpired out of the usual army experience of life; nothing as bad as was experienced over and over again in the war for the Union, yet she furnished 140 regiments then without any great difficulty. The reason is obvious.

YELLOW JOURNALISM.

Yellow journalism, that low type of newspaper work which lives only by detraction, had not fully developed at the time of the war for the Union. A few faint stragglers towards it were developed in the early days of the war in a few localities, but they were suppressed by a wholesome fear that indignant loyalty would assert itself, not through the slow process of the courts, nor through the slow machinery of military rule, but through the spontaneous uprising of an indignant people, who would not tolerate a form of criticism that would tend to make the unavoidable incidents of war a source of profit to those who would traffic in them. Some way, some how, at some time in the near future such journals must feel the strong arm of law, teaching them the difference between liberty and license. We must not enter another war without authority to suppress that so-called criticism which seeks to make soldiers discontent in the field and their friends at home needlessly unhappy. None of the incidents of war are lovely or to be desired on their merits, and it must not be allowed that, for the sake of pelf, a stay-at-home class shall fatten on the inevitable, to the detriment of the public.

THE RESULTS.

It is too early to give even a summary of the results of the war. It is enough to say that we, the people of the United States, have never wrestled with a problem that we could not solve. It may take months yet, or even years, to adjust our governmental machinery to the new conditions, but it will be adjusted and all will run smoothly; meanwhile we take a great deal of comfort in calling the attention of our readers to the fact that the brick industry has had and is yet having a prosperous year wherever there has been American pluck enough to push things. Our advertisers are all fairly busy and contented, while those who have bought their goods thank the Clay-Worker for the information which led to profitable investments. We rejoice, too, that we have not had to resort to any tricks to obtain new patrons or retain old ones. We are content, so are our patrons. All are agreed that we are just on the eve of a season of unprecedented activity in all commercial and industrial lines, so let us to work, granting the greatest measure of success to those who most deserve it.

The Commissioner General for the United States to the Paris Exposition of 1900, Mr. Ferdinand W. Peck, Auditorium Building, Chicago, is sending out the preliminary announcements urging those who intend to make exhibits to take up the matter at once. Those of our readers who desire information as to allotment of space, etc., are requested to write to Mr. Peck.

Every day almost we see some new color or shade of front brick. The development during recent years in the manufacture of front brick is wonderful indeed. A lady can all but match the varying shades of the colors in her hat in the colored front brick now on the market. Then there are the varying qualities of finish, smooth and rough surfaces, which add greatly to the variety.

Written for the CLAY-WORKER.
WHEN REUBEN QUIT.

When Reuben quit the brick machine and went to readin' law.
A smarter man at strikin' brick our county never saw.
He'd such a way at slingin' mud that none could imitate,
And how he led his crew to work, why sir, 'twas simply great,
And how he struck or shoveled mud or baked or sot a kiln
And handled wood and managed heat it shorely filled the bill.
And he was sounder than a nut and square as any brick,
And kind, well he could give a parson points and turn the trick
And so I say, a better man no brick yard ever saw,
Than Reuben when he quit the mud and went to readin' law.

II.

When Reuben quit the brick machine and went to readin' law
There wa'nt a man of keener sense that ever worked a jaw.
He knew his biz from A to Zed, and people 'lowed he did,
And he didn't seem to worry if his light was being hid.
He wore no standing collar then or gew gaws on his vest,
He acted 's if he thought a flannel shirt the very best.
And all of us we freely said, there wa'nt a single flaw
In Reuben, 'fore he quit the mud and went to readin' law.

III.

When Reuben quit the brick machine and went to readin' law
Ther wa'nt a gal in Clayville sir, 'at would'nt grab his paw,
And he could married many belles with bank accounts to burn,
But Reuben had a roll himself and marriage wa'nt his turn.
Old vet'rans used to prophesy great things for Reuben then,
And when he twice declined to head our board of selectmen
Folks said it showed that bigger grists were stored in Reuben's
craw;
That's 'fore he quite the brick machine and went to readin' law

IV.

When Reuben quit the brick machine and went to readin' law
An airthquake could'nt riled us like the change that Clayville
saw
That Sunday, when he come to church the choir forgot to sing
We all wuz dumb a lookin' at his fob and dimond ring.
And glasses on him trimmed with gold and in a biled shirt slick
A glistenin' jewel clear, and big's a corner of a brick
And, friend, I really prayed his collar might'nt cut his jaw,
When Reuben quit the brick machine and went to readin' law.

V.

When Reuben quit the brick machine and went to readin' law
He didn't seem so tongue-tied as he used to be befor'.
He talked about the "future" and "professions" and "success"
Till all of us got weary with his drizzley drawing mess.
And I 'low we didn't like it when he told calm and cool
That a man who'd stay brick makin' was a sort of biped mule;
Ef 't had'nt been for what he'd been, I swan I'd swiped his jaw,
When Reuben quit the brick machine and went to readin' law.

VI.

When Reuben quit the brick machine and went to readin' law
Twa'nt long before he saw that he hed somehow made a flaw.
We cut him dead and he was sad, and soon's he was a 'squire
He went away from Clayville. Where he went we don't inquire.
But sometimes down in Clayville you should see us wink and
nudge
When some coddin' drummer strings us as how Reuben is a
judge,
For we all agree they're coddin', saddest sight you ever saw
Was when Reuben quit the brick machine and went to readin'
law.

VII.

When Reuben quit the brick machine and went to readin' law
It shorely spiled a workman that we thought without a flaw.
But I don't know why those drummers keep on talkin' as
they do,
For we won't belittle Reuben, though we doubt their stories
true.
Only just last night one ast me honest Injun like and stout,
"Was'nt Congressman Rube Rankin a brickmaker hereabout?
He speaks highly of you people and he says he's proud to say
That he got his richest lessons down here, somewhere, mold-
ing clay."
And I swan that sounds like Reuben. But believe it? Eh?
Oh pshaw,
Not since Reuben quit the brick machine and went to study
law.

TABLE OF CONTENTS.

Clay in Architecture	177	A Mammoth Monmouth Jar ..	216
Hints on Brickmaking.....	178		
The Clays and Clay Industries		CORRESPONDENCE:	
of Northwestern Indiana	178	The New York Market.....	200
A Tour of Scotland.....	180	Which is the Best Dryer?.....	202
Social Brickmakers.....	181	Another View	202
Relative Value of Coal and		The Brick Plants of Texas.....	202
Wood as Fuel.....	181	Why Not Terra Cotta Monu-	
The Development of Hollow		ments?.....	202
Block Manufacture	182	Dry or Semi-dry?.....	202
Manufacturing Slag Brick in		St. Louis Notes	203
Russia.....	184	The New England Klondike...	218
Modern American Front Brick	185	The Chicago Situation.....	218
Button-Hole Talks.....	187	Pacific Coast News.....	224
The Ohio School for Claywork-			
ers	187	EDITORIAL:	
Brick Pavements Best for Small		Current Comment.....	212
Cities.....	188	Business.....	212
Importance of Good Founda-		Cost of Terra Cotta and Stone..	212
tions.....	189	Veneer Houses	212
Brick Paving in Des Moines ...	190	The Home-Coming Soldier.....	213
Fillers for Brick Pavements ...	191	A New Enemy.....	213
Anglo-American Pottery.....	192	The Yellow Journal	213
Legal Standard for Paving		Yellow Journalism.....	213
Brick	194	The Results.....	213
Making Brick in Mexico	195	Editorial Notes and Clippings ..	222
Among the Brickmakers of			
Philadelphia and Vicinity... ..	196	MISCELLANY:	
A Brick Factory in a Wooden		The Trade Journal.....	185
Town	197	The Safety of Railway Travel..	186
A Great Fuel Saver	198	Mineralogists Make a Discov-	
A Hand Re-Press.....	199	ery	197
Clayworkers at the Illinois		Buff Clay Wanted.....	197
State Fair.....	199	When Reuben Quit.....	214
Portable Chain Elevators.....	201	A City's Liability for Bad Brick	
Why Mr. Hensley looks Pleas-		in a Sidewalk.....	224
ant.....	203	Peoria Gets the Next Conven	
The Battenfeld-Morgan Co....	203	tion.....	224
The Milwaukee Brick Market..	216		

Index to Advertisements on Inside Cover Page.

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H. A. Wheeler, E. M.,	1.00
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MONTHS
RECORD**

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**VICTOR
RE-PRESS**

Victor

Ontario Paving Brick Co., Toronto, Canada, use two.
McAvoy Vitrified Brick Co., Perkiomen Junction, Pa., use one.
American Clay M'f'g Co., Pittsburgh, Pa., use one.

Is

Clarksburg High Grade Shale Brick Co., Clarksburg, W. Va., use one.
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TWENTY OF THESE POPULAR
RE-PRESSES SOLD AND
PLACED IN SUCCESSFUL OP-
ERATION DURING THAT TIME.

C. W. RAYMOND & CO.
DAYTON, OHIO.

THE MILWAUKEE BRICK MARKET.

—Better, Busier Times in the Cream City.—

MILWAUKEE BRICK makers are glad the war is over. They have good reason to be, for immediately the protocol was signed and people began to feel that all uncertainty was past, the brick trade began to boom again and the yards all caught the spirit of the change and became active as in former times. The influence of the war on the business was marked. In the spring the demand was quite normal and there was every prospect of a satisfactory summer's business. But in April, when the war broke out, the bottom of the brick trade dropped out, and the dullness continued persistently till peace was again declared.

Along with the revival of the brick market is the further fact that the Milwaukee makers are now working under an agreement by which they get a fair rate for their brick, and for this reason the revival in trade is doubly gratifying. It may be remembered that after the Milwaukee Building Material Company went to smash—this company included all the yards and was regarded by the local press as a brick trust—prices went down to the most ruinous figures. Most of the yards closed up tight rather than manufacture at a loss, and those that did keep open got into a close competition with each other that brought pleasure to neither party to it. There is absolutely no fun in turning out common brick at \$3.50 a thousand, the Milwaukee brickmakers say. No one is likely to dispute the proposition, either. Relief came in the early part of April, when an understanding was reached between all the yardsmen of the city. This was the result of almost interminable confabs and propositions, and also partly dependent on a change in the status of the competition from Chicago.

Owing to glaring partiality on the part of the railroads, the Chicago people flooded the Milwaukee market with brick that came here practically as ballast, and they had everything their own way. There wasn't much money in it for them, but they could feel that their surplus output was being worked off, and that was something. It appears, however, that a combination has been effected in Chicago, by which the yards are only operated to supply the demand locally without the waste that is inevitable in competitive production. This removed the Chicago brick from the Milwaukee market, and made a local combination looking to a fixing of the price possible. This understanding was arrived at and so the ruling prices from that time on have been \$6.50 for common brick, \$7 for sewer brick, and \$9 for select brick. These are the prices obtained at the present time.

The Milwaukee yards that are in the existing agreement are Burnham Bros. (two yards), E. Chase & Sons, Standard Brick Co., J. L. Burnham & Sons, Cream City Brick Co., Charles Kraatz's Estate, Milwaukee Brick Co., and M. Davellaar & Sons. The agreement is in no sense a trust, and merely exists to keep prices up to the point where brick can be made without loss.

There is just now a good demand for brick in the country round about Milwaukee and the country yards such as those at Port Washington, Schleisingerville, Madison and other places have all they can do to supply this demand, and are shipping practically no brick to Milwaukee. The prices received in the country are higher than those obtained here, common brick selling at \$7. This is for a good cream colored brick, similar to that turned out here. About all the brick Milwaukee sends out now is select brick. More would be shipped if the railway rates were at all favorable.

The local demand just now comes from small buildings largely, mostly the buildings of the poorer classes who put up cheap houses on lots they have acquired on the outskirts. These people have come to realize that brick foundations are better for health and the long life of the house than wooden posts. While the brickmakers do not depend on this class of custom, it cuts quite a figure. There is some large building to figure for, too. The Milwaukee Light and Power Co., that operates the street car system of the city, is about to put up a new and larger power house, which will call for about 3,000,000 of brick. It is not yet known which yard has received the contract. The building will be 130 by 100 and three stories high. It will be located at the corner of Oneida and River streets. Another large building will be that of the F. A. Walsh Tinware Co., and still another a large addition to the Pfister & Vogel tannery.

Altogether the local manufacturers look for an increased demand this fall and expect a good spring trade. They are all well stocked, having taken advantage of an abundance of good weather the past summer to work the yards full time.

A MAMMOTH MONMOUTH JAR.

THE LARGEST POTTERY in the world is said to be that of the Monmouth Pottery Co., Monmouth, Ill., where all kinds of stoneware is made on a mammoth scale, the total capacity of the plant amounting to more than 6,000,000 gallons per annum. They not only make large quantities of ware, but they make quantities of large ware, as is clearly demonstrated by the accompanying illustration of a 60-gallon jar. They have made jars still larger. They recently filled an order for a lot of 80-gallon jars for chemical purposes, and are now arranging to make some 100-gallon jars. In response to our request for a detailed description of the process of making these large jars, they say that some of the details are kept secret, particularly the drying and burning. The jars are made on a large press, similar to a sewer-pipe press, but with nu-



merous attachments. The jars come from the press complete, excepting the handles, but require some trimming and dressing down. The drying process is much the most important part of the work, the dryers being specially constructed, differing from ordinary stoneware dryers, and the pots have to be turned and nursed quite carefully before they are ready to burn. Care must be taken in setting them in the kilns and in the firing, or the pots that go into the kilns sound in every way will come out worthless. They have now perfected the manufacture so that the percentage of loss is small, but a little carelessness will soon run it up to a very unsatisfactory figure. Their press and attachments require two complete floors of a new five-story addition built last summer when the factory was rebuilt, having been partially destroyed by fire. The drying requires nearly the entire fourth floor of the main building. They are having a big demand for these large jars, and a short time ago shipped a full car-load of 20-gallon jars to a point on the Pacific coast.

FOUR STYLES OF.....

"Monarch" Machines



Has Double Pug Mills,

Giving the most tempering capacity of any Machine made.

Double Presses

Giving the most pressing capacity of any machine made.

Presses

Are "all in the mud," thereby eliminating all unnecessary friction and wear.



These and other MOST IMPORTANT points which are

IN NO OTHER.

The "Iron Quaker" Machines

For 1898 are BETTER THAN EVER.

This cut shows the steam power in connection with our Mould Sander.

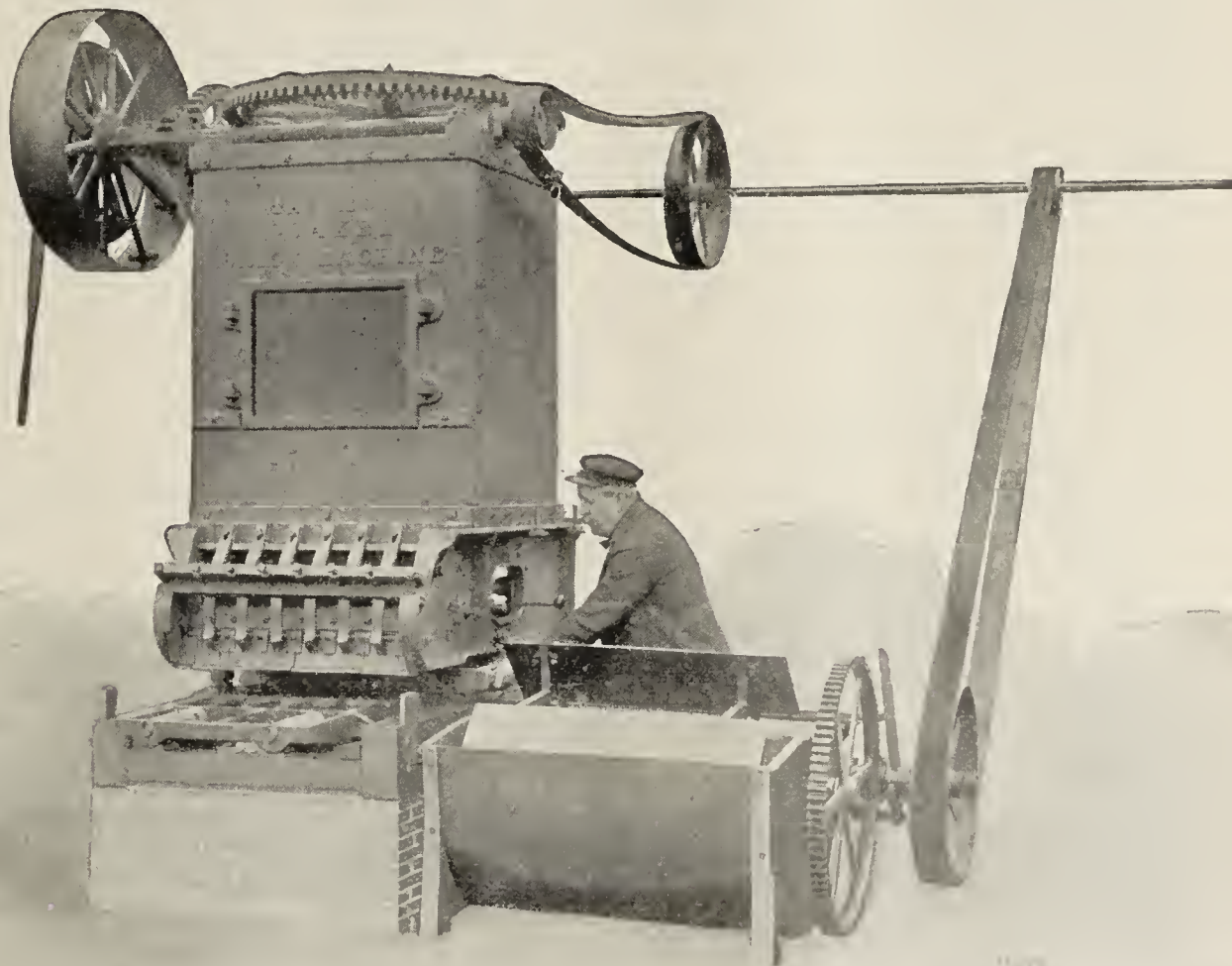
Our Horse-Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE. At Bargain Prices.

Odd sizes of moulds. Have not been used.

20 moulds, 8 13-16 x 4 3-16 x 2 7-16. 9-16 in. partitions.
2 moulds 9x4 1/2 x 2 3/4. 9-16 inch partitions.
3 hand moulds (3's) standard size.

Second-hand, but used a few days only.

10 moulds, 9 1/2 x 4 9-16 x 2 3/4. 1/2 inch partitions.
19 moulds, 9 1/2 x 4 5/8 x 2 9-16. " " "
16 moulds 9x4 1/2 x 2 1/2. 9-16 inch partitions.
19 moulds, 9 x 4 1/8 x 2 1/4.

The Wellington Machine Co.,
WELLINGTON,
OHIO.

Send for Circular.

THE NEW ENGLAND KLONDIKE.

An Ex-Brickmaker's Observations on the Project of Extracting Gold from the Sea.

Editor Clay-Worker:

I have just returned from the "Klondike," and strange as it may sound, I found the heat well nigh unendurable there. However, the Klondike to which I refer is but a matter of four miles from here. It is the most easterly point of the mainland of Uncle Sam's domain. Get your map and find Lubec, away down in this corner of Maine, and you'll find the jumping-off place, and the place where the Reverend Mr. Jernegan and his co-laborers (in the financial and industrial scheme) say they are extracting gold from the waters of the Bay of Fundy. Gold from sea water, you know, is the new fad, which the Rev. Mr. Jernegan has made popular in New England. All of "us scientists" could have told you years ago that there was gold in sea water, just as we could have told you that there was aluminum in brick clay and profit in a brick yard. The only thing that we could not tell you then or now about either of those things, is how to find the profit. But Rev. Mr. Jernegan and his friends have found the secret of turning a flood of gold out of the sea and into the arid and desert pockets of the multitude. It is just as simple as falling off a log or burning a balky kiln. All you have to do is to cage large areas of ocean brine and let it run of its own volition, through the meshes of certain boxes, in which boxes the alluring bait which attracts and catches the coy and fleeting gold is set. I don't know what kind of bait they use to do this, and there don't seem to be anybody but a couple of Mr. Jernegan's friends who do know. I am sorry I can't tell you any more about it, but the men who hold the secret are locked up in the accumulator rooms. The gray-haired office boy, with whiskers like a goat, and an exalted slant to his olfactory organ, whose duty it is to carry the bag of silver and greenbacks from Eastport to pay the help with, keeps guard over the men who hold the secret, and if you want a short hair cut, stand in the doorway and ask politely if you can talk with the manager. Politeness is much the same in this sea-water Klondike as in the other, but then it is a momentous duty which devolves upon the little man who acts as Cerberus at the gold chamber. The company is founded upon capital mostly gathered from the poorer classes of the country, it being the Rev. Mr. Jernegan's desire that this great engine of wealth should not be run to make the rich richer and the poor poorer, but to make the poor rich and let the rich take care of themselves, as they have always had to do.

If you ever let your thoughts wander so far East as this they might have gone away impressed with the fact that the Maine coast is like a long saw whose irregular teeth run miles and miles into the sea and the sea in turn makes various attempts to divide the earth. On one of these arms of the sea, bay, river or creek, the gold fishers have set their plant. Here they are extending the arm of the sea inland and widening it in the shape of a canal two miles or more long, across the peninsular of Lubec to another bay or creek so that the incoming and outgoing tides will pass in one end and out the other through the accumulators or boxes. There are 600 men employed in digging the canal and constructing the wharfs and buildings. It is estimated that \$3,000,000 will be laid out here this year. There will be 5,000 accumulators when the plant is finished and each accumulator, Mr. Jernegan says, will accumulate one dollar a tide. The only work to run the plant will be to bait the traps and remove the gold they catch. When first removed the crude gold looks like common brown mud. The tide here rises more than 30 feet and the reservoir or canal will hold 1,100,000 tons of water to a tide, and it is confidently stated that the tides will come in twice a day and give up their gold. Old residents are inclined to believe this, for they say the tide hasn't missed coming once in sixty years, unless it was at night, when folks were asleep and couldn't see it if it didn't. But there are some scoffers from the unholy land of John Bull, which is only a stone's throw away, who say nothing about tides, but jeer at the idea of gold in Lubec water. Their argument is, that a Lubeckian was never known to lose his appetite for "auld Scotch whuskey," though many of them on their way home from Campobello have taken in and rejected again whole tides of sea water before being resuscitated. Were there gold in it, the "Johnnies" say, some Lubecker of them all would have been gold-cured long ago. Stock in the enterprise could be bought a month ago for 25 cents a share, and the members of the corporations are advising the workman and their employers to invest in shares. Stock has been offered for sale to

the farmers and small traders in the hamlets hereabouts. The company seems determined to distribute its blessings among the poor, else it seems it might easily place its stock with New York financial houses. About \$20,000 of bullion has been shipped to the New York assay office, which, the officers say, was accumulated in about two months by the 250 accumulators already in position. The company, however, is still bringing ordinary everyday bank bills from Eastport to pay its help, and this it has done so far regularly, a gratifying feature of the great scheme. Besides his labors at the Klondike plant, Rev. Mr. Jernegan labors with sin among the fishermen, and his Sunday sermons are brighter than the glint of the gold in his plant and hotter than it was over there to-day.

That's saying a good deal.

Exit the gold cure! Avaunt the gold from sea water!

Tell your folks to make brick awhile before rushing to the sea, with different kinds of bait.

But if they will insist on fishing for gold, tell them to try the same old bait they carried when trout fishing, for awhile. It may not be as good as Mr. Jernegan's, but we know more about its results. It made us feel really rich, while the man who held it out to us got the gold and somebody else got the fish. Mr. Jernegan, of course, is not dealing in that brand of bait. Perhaps with his bait the real fisherman will catch what he buys his bait for.

Should I become assured that the sea is a gold mine; if it is proven to my satisfaction, I shall take a salt water bath and write you at once describing the sensation of rolling in wealth. I bathed in sea water once and in plain water two or three times in my life. But I'm not a Lubecker. DUNN.

P. S.—Since writing the foregoing the newspapers have ventilated the swindling scheme pretty thoroughly, and the Rev. Jernegan has gone to Europe, perhaps to repeat there, with slight variations, his gold-procuring experiment. It strikes me that Messrs. Fisher and Jernegan's bait was the most seductive article ever hung upon a hook. The name Fisher is suggestive. And so, by the way, is Jernegan. They fish awhile, then journey 'gain. But think of the poor sun-baked souls (and only half baked at that), whose salvation seemed to hang upon the earnest exhortations of the Reverend Journey again every Sunday. Yet their condition is not a circumstance to that of those who put their hard-earned dough into that trough of the sea to be washed away into the pockets of the pious rascal.

But the public likes to be humbugged. If that be true, we'll canonize him and make him Saint Jernegan.

Strange as it may seem, there is much more gold in a well-located mud-bank than there is in the sea.

Isn't it queer? Isn't it sad?

After all our enlightenment, after all the advancement made in the arts and sciences, we can't get something for nothing yet. The only way seems to be the old way of honest work and eternal vigilance. D.

THE CHICAGO SITUATION.

Building trades in Chicago are showing considerable improvement. Several unusually large manufacturing plants are being erected, among them the big steel works at Pullman, and an extensive tube works at East Chicago. Numerous large apartment buildings are going up all over the city, especially on the South Side.

There is quite a demand for common brick, and the agents for pressed brick are wearing more cheerful countenances than at any time for several years. They report business brisk, while the fire brick and cement men are entirely unable to supply the demand except on long-time deliveries. Altogether, things look a good deal more like old times since the war closed, which affected the building trades more than almost any other industry here.

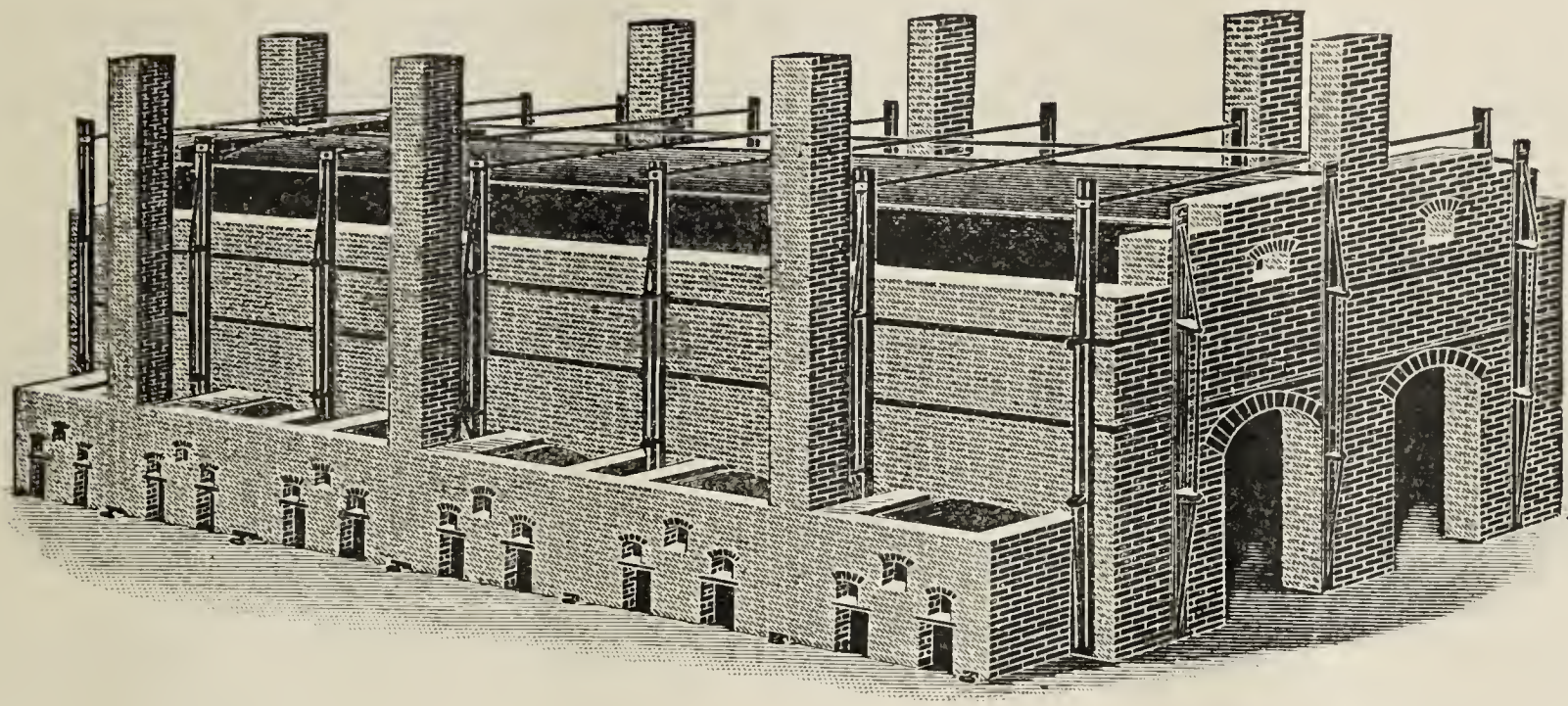
The brick machinery men report they are receiving more inquiries and more visits than at any time this year, showing the improvement to be general throughout the country.

The large cement plant of the Chicago Portland Cement Co., which was burned down several months ago, is almost ready to start up again, having been equipped with entirely new machinery throughout.

The Pioneer Fire-Proof Construction Co. is making a large number of improvements in their works, adding new machinery.

The old Anderson Pressed Brick Works, after lying idle several years, is now being dismantled, and a street will be opened through the property.

**“One of the Greatest Inventions of
Modern Times.”** F. W. BUTTERWORTH,
Asst. Gen'l Man. Marion Brick Works.



The Swift SLACK COAL COKING-TABLE Furnace Kiln.

THE KILN which has a solid bottom, which is much cheaper to begin with, and is always in repair.

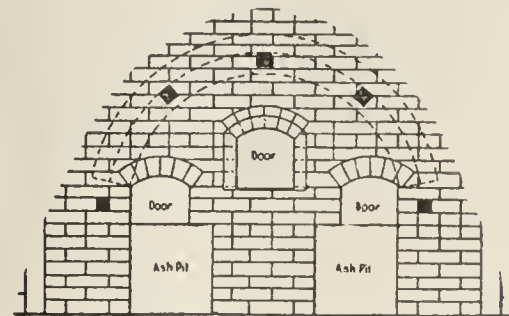
THE KILN that will save one ton of coal out of every seven tons you are using.

THE KILN which is so constructed that the heat is drawn from the bottom with Fan to dryer without danger of checking the cooling ware.

THE KILN that we will guarantee to burn any kind of clay ware with nothing but Slack Coal from start to finish of burn.

THE KILN that will burn Paving Brick in from 30 to 60 hours less time and not injure the ware, as the cold air is excluded from start to finish.

THE KILN that has the famous **Swift Coking-Table Furnace** attached to it; the furnace which is to-day being attached to all kinds of kilns—Up-draft, Clamp, Down-Draft, Round and Square, and also one continuous Kiln, has been re-modeled, and is giving entire satisfaction.



THE SWIFT COKING TABLE FURNACE.

F. E. SWIFT,

Send for Catalogue.

Washington, Iowa, U. S. A.

The Des Moines Brick Manufacturing Co.,

—MANUFACTURERS OF—

Vitrified Paving Brick,

DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities

Estimates on Brick pavements cheerfully given.

The Clinton Paving and
Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: Clinton, Ind.

INDIANA PAVING BLOCK,

The Standard Shale Block for
Street Paving.

Manufactured at Brazil, Ind., by the

Indiana Bermudez Asphalt Co.,

Main Office, 25 and 26 Baldwin Block,
INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.

W. C. SIBLEY, PRES.

J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES,
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of \$1.00.

T. A. RANDALL & CO.,

Publishers,

INDIANAPOLIS, IND., U. S. A.

T. B. McAVOY,
President.

FRANK B. McAVOY,
Secretary and Treasurer.

McAvoy Vitrified Brick Company,

OF Philadelphia, Penn.

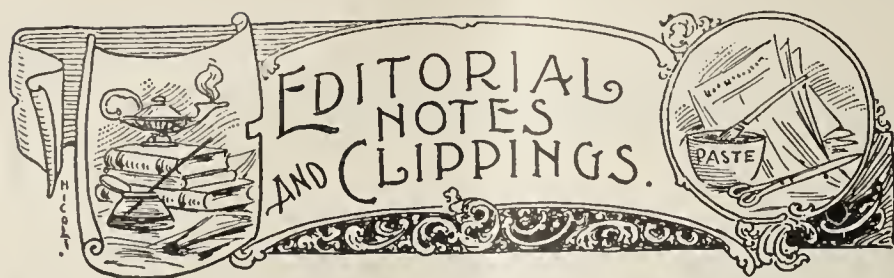
Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee. Correspondence solicited.

OFFICE:
1345 Arch St., Philadelphia.

WORKS:
Perkiomen Junction, Penn.

The Purington Paving Brick Co., of Galesburg, Illinois,

 AS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business. Correspondence respectfully solicited.



Wiscasset, Me., is to have a new brickyard.

The tile factory at Rochelle, Ill., was burned Sept. 13. Loss, \$15,000.

Charlestown, Ind., is to have a new brickyard and a tile factory.

James Gaul will probably start a small brickyard at Middle Grove, Ill.

S. M. Edgington, of Edgar, Neb., and others are thinking of starting a brickyard at Steele City, Neb.

The Ogden brickyard at Port Dickinson, N. Y., was slightly damaged by fire Sept. 1. The flames originated in the dryer.

A. L. Stein, of Atlanta, and J. D. Fletcher, of Washington, Ga., contemplate erecting a pressed brick plant at Attalla, Ala.

R. E. Norman, Waycross, Ga., may start a brickyard near that town this fall. He thinks there is an abundance of good clay there.

A company is being organized at New Brighton, Pa., for the manufacture of enameled brick. I. N. Shugart can give particulars.

D. P. Guise, the well-known brickmaker, of Williamsport, Pa., recently secured a contract for 200,000 pavers for the streets at Washington, D. C.

The brick and tile factory of Webb & Hart, at Cook's Mills, Ill., was damaged by fire the last day of August. The loss was partly covered by insurance.

L. H. Kaplan is experimenting with the fire clay recently found at Mount Kaplan, near Anniston, Ala. He thinks he has a very fine deposit of clay.

Anton Morella, foreman of the Cleveland and Canton Brick and Tile Company's works, near Cleveland, was killed by a cave-in at the clay bank Sept. 7.

O. S. Foster, a prominent citizen and life-long brickmaker at Revere, Mass., died there the 5th inst. of typhoid fever, at the age of 63. He leaves a large estate.

The Dunbar (Pa.) Brick Co. has recently put in some new machinery, including, among others, one of the Horton Manufacturing Co.'s Hercules brick machines.

Ulrich X. Stehle, Pound, Wis., contemplates starting in the brick business in that section, and will be pleased to receive catalogues of machinery, dryers, kilns, etc.

The Montowese Brick Co. has been incorporated by William Spillter, Henry Born, C. F. A. Westermann and Edward Boehm, of New Haven, Conn., with a capital stock of \$12,000.

It is reported that Liverpool, O., potters are investigating the advantages offered by Evansville, Ind., and are so well pleased that they will probably establish a large pottery there.

General Manager Landers, of the U. S. Encaustic Tile Co., of Indianapolis, says they have been quite busy the last few months, and the prospects for fall business are very bright.

The Carlinville (Ill.) Tile Works has been incorporated by D. T. Michaels and H. C. McBride, of Taylorville, with a capital stock of \$50,000. They propose to make both brick and tile.

E. J. Neher, Hollywood, Ala., is arranging to start a brick and tile factory in the vicinity of Hollywood, and desires prices on a moderate cost horse or steam-power equipment, the former preferred.

A miscreant broke into the brick plant of Woodcock & Oakes, near Princeton, Minn., one night recently and cut every belt in the factory, causing the only shut-down of the season for them.

The first bad pottery fire of the year occurred the morning of the 12th, when the East Liverpool (O.) pottery's plant was partially destroyed. The damage to the building and ware amounts to over \$15,000, fully insured. The company will re-

build immediately. It is over fifty years since the original plant was established, and it has been partially destroyed by fire three times.

The American Clayworking Machinery Co., Bucyrus, O., write under date of Sept. 3, that their business is very good, much better than last year; in fact, they have all they can take care of comfortably.

Mr. John O'Neill, a wealthy brickmaker of Portsmouth, was found dead in his bed on the morning of Sept. 7. As he had not complained of being ill, heart trouble is supposed to have been the cause.

Paducah, Ky., is quite a clay center. J. A. Bauer has a pottery there that gives employment to sixty men, and G. W. Baldwin is operating a brick plant that gives employment to nearly as many more.

There was a fire at the Hamilton (O.) Tile Works, the 5th inst., that for a time threatened the destruction of the entire plant, but was subdued before serious damage resulted. Loss covered by insurance.

It is reported that our venerable, yet youthful, friend, Capt. S. P. Crafts, of New Haven, Conn., recently came into possession of a Hebrew synagogue. We await the Captain's version of the story with interest.

The Lower Brick Co., Sioux City, Ia., has been incorporated with a capital of \$30,000. They will operate the plant formerly known as the Sioux City Brick and Tile Co., which was recently sold at sheriff's sale.

The Willimansett Brick Co., Chicopee, Mass., has been placed in the hands of a receiver for the purpose of dissolving the partnership. The business of the company will likely be continued under new management.

A. G. Shaver, Secretary of the Belmont Brick and Tile Co., Martin's Ferry, O., has sold his interest in that company to Charles Carpenter, president, and will go to Porto Rico, with a view to locating there permanently.

Prof. M. A. Brannon, of the State University, Grand Forks, N. D., has purchased the press brick plant at Dickinson, N. D. The plant has been idle for some time, and Professor Brannon will at once put it in condition for operation.

Mr. J. W. Carson calls our attention to a typographical error in his letter in August issue, by which he was made to say that the LaPrairie Press Brick Co. are using a Peerless up-draft kiln. They are using three Peerless kilns, with very gratifying results.

The Henry Martin Brick Machine Mfg. Co., Lancaster, Pa., write that their business is some better than last year, with prospects for a satisfactory fall trade. They lately made a large shipment of brick machinery to London, and expect to make another very shortly.

A new Federal penitentiary is to be built near Leavenworth, Kan., and it is proposed to install machinery for the manufacture of both pressed and common brick. The warden estimates that 25,000,000 will be required. The clay has been tested and proven satisfactory.

A furious storm passed over Little Ferry, N. J., on Wednesday afternoon, doing great damage at the Mehrhof brick yards. Sheds were torn down, and a kiln of bricks toppled over. The loss is estimated at \$2,000. Other brick manufacturers also suffered loss, but not to any great extent.

Dennis Buckley is building a new, up-to-date stiff-clay brick plant near South Wilkesbarre, Pa. The machinery was furnished by the Chambers Bros. Co. Mr. Buckley will soon be making 30,000 brick a day. Business is good in that vicinity, brick being in good demand at \$5.50 to \$6.

Clark Bros., of Morenci, Mich., write that about 2:30 p. m., Aug. 15, they discovered smoke coming from one of the ventilators of their machine building at the tile yard, and in twenty minutes the whole plant was burned to the ground, including engine-house and adjoining buildings, causing a loss of \$8,000, with insurance of \$2,000.

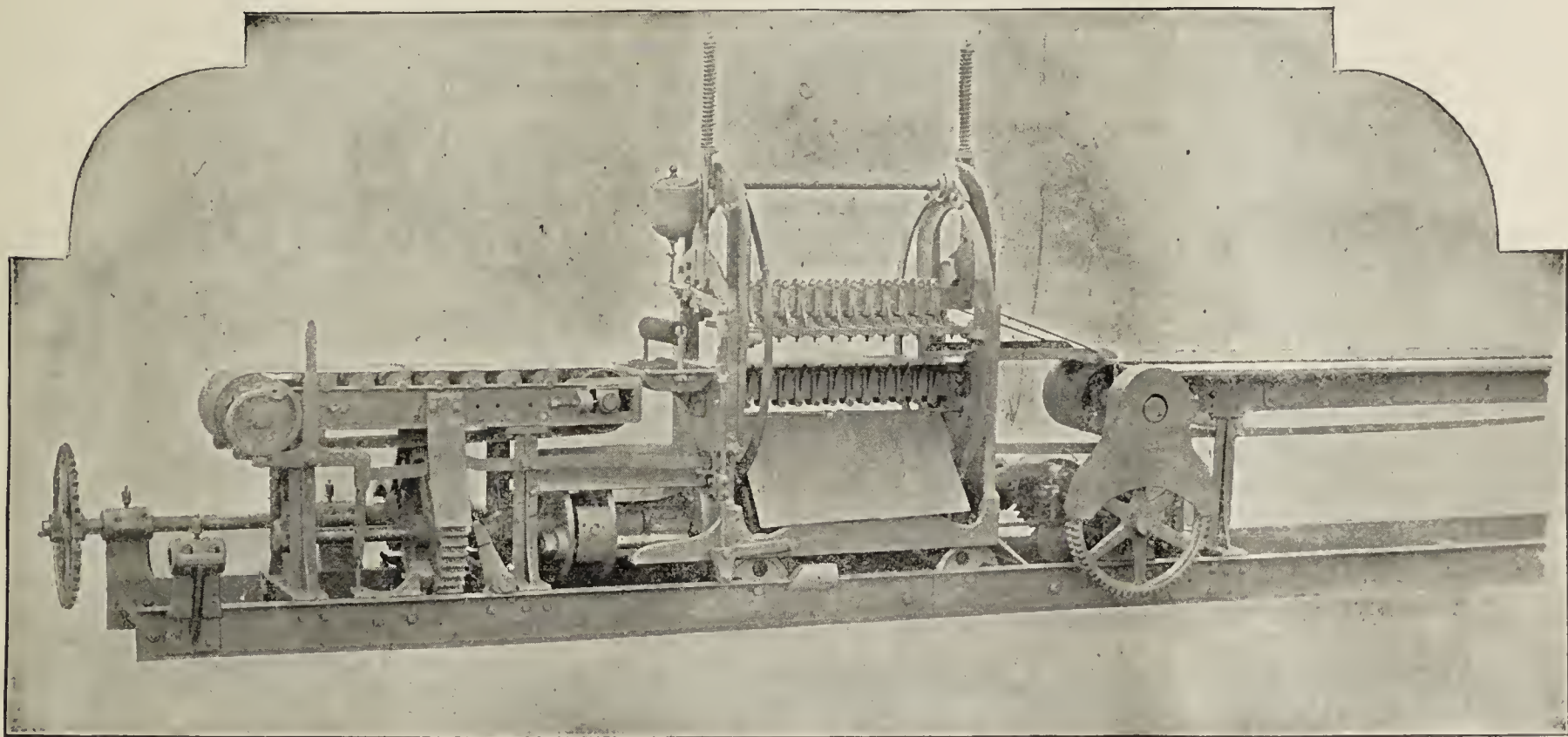
The offer in our columns of a brick plant at Kansas City, Mo., with unlimited shale for pavers, and plenty of clay for fine press brick, both without stripping, and a sidetrack, is an opportunity not often met with. It affords some practical brickmaker a chance to buy a first-class plant that will pay for itself from the profits of a couple of years' business. The fact that there is only one other shale bed—and that of limited quality, where shale must be mined—within many miles of a city of

The Ear Marks of Originality are so
Prominently Displayed in the

Cunningham's Improved Combination Automatic End and Side Cut Brick Cutter,



That we Feel Justified in Claiming Priority.



There is a difference of opinion as to whether end or side cut brick is the best. With this Cutter, you can give your customer just what he wants and not what you happen to have.

For particulars regarding this Cutter, and a full line of Brick and Tilemaking Machinery. Address,

Wallace Manufacturing Co.,

CHICAGO AGENTS:
Chicago Brick Machinery Co., Chicago, Ill.

FRANKFORT, IND.

See Ad. on Page 251.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

two hundred thousand inhabitants, a city where the bank clearings have run from nine to twelve million dollars per week during and since the panic of 1893, speaks well for the location. Who will be the lucky man or men to take it in, and so add one more to the numerous family of clayworkers?

J. M. Powell, Orestes, Ind., writes that his drain tile trade is better than it has been for several years. He is virtually sold out, and finds it difficult to stock up, as the demand is fully up to the present capacity of his works. His brick trade is also very good. There is nothing to complain of, except that prices still rule very low.

The Humbolt (Kan.) Brick Mfg. Co. are now fully under way, turning out a fine grade of vitrified paving brick, which they think cannot be beat. Every department of the plant is running very smoothly. The machinery was furnished by the American Clayworking Machinery Co., Bucyrus, O., and has proven very successful.

Henry T. Jones, one of the pioneer brick manufacturers of Chicago, Ill., died the 5th inst. Mr. Jones moved to Chicago in 1851, and was actively connected with the brick business until five years ago, when he retired, and since then has been living at Crystal Lake, Ill. He was 75 years old, and leaves a widow and seven children.

The clay mine located on the Mutton Hollow Road, owned by the Watson Fire Brick Co., and until recently was operated by Albert Martin, of Woodbridge, N. J., has been leased to P. L. Ryan, of the latter place. Mr. Ryan is well known among the numerous clay manufacturers of the eastern part of the United States as a reliable clay shipper, and consequently the demand for his clay is very heavy.

E. S. McLain, a well-known fire-brick manufacturer of Pittsburg, Pa., was accidentally shot and instantly killed Sept. 2 by his son. The accident occurred at his summer home, near Akron, O., where the family have been spending the summer. The father and son were out duck hunting, when, in some unaccountable manner, the boy's gun was discharged, the load of shot striking Mr. McLain, causing instant death.

The Elmdale (N. S.) Brick Co. have recently built a model dry press brick plant and a battery of Peerless kilns. The machinery was supplied by the American Clayworking Machinery Co., Bucyrus, O., but the plans and specifications were supplied by the Peerless kiln people (see ad. on page 229), who also superintended the erection. Mr. Lantz, the president of the concern, is one of the energetic, go-a-head kind of men, and is the pioneer of the dry pressed brick business in that province. We understand that he has bought the right of the Peerless kiln for that province.

PACIFIC COAST NEWS.

San Francisco, Sept. 5, 1898.

R EPORTS FROM DIFFERENT PARTS of California, Oregon and Washington certainly confirm the fact that a new era of prosperity is beginning, when we hear of so many new brickyards and kilns starting up or nearing completion, and new machinery being placed. Surely these signs are significant and mean much to the brick and clay industry of the Pacific coast. Notwithstanding the bright outlook for the future, there are some manufacturers who have not yet received much, if any, encouragement, but it will only be a matter of a short time when they will fall into the line of progress and go forward on a steady and continued march of prosperity.

Sewer pipe is quite in demand just now, say N. Clark & Sons, San Francisco. The brick trade is also picking up.

Gladding, McBean & Co. have nothing of particular interest to report at this time. Business is running along smoothly with them.

Fire has been started under Bader & Brook's second kiln of brick at LaGrande, Ore. It contains about a quarter of a million brick.

The Kendrick, Idaho, brickyard, has started to burn the third kiln of brick. It contains about 300,000, and finds a ready market in that neighborhood.

S. H. Johnson has leased ground at San Pedro, Cal., and will start a brickyard. He has the lease for five years, and must not burn less than 100,000 brick each year. He will erect a fine plant, and commence making brick as soon as possible.

The brick work on the new court-house at Eugene, Ore., is

now nearly completed. As soon as the cornice is placed on the tower the work will be completed without delay.

George Flagg is making preparations to burn a kiln of brick at Antelope, Ore., for flues, cellars, etc. The kiln will contain about 150,000 brick.

Simmons Bros., the well-known Pasadena, Cal., brick firm, have the new steam brick works in Los Angeles, Cal., in full blast now, and are turning out some excellent brick. They have organized under the name of the Pacific Brick Co., and have a modern plant for turning out great quantities of brick.

H. B. Kersting has returned from an exploration trip to the Klondike, and will again engage in the brick business in Phoenix, Arizona.

The big brick kiln at Jerome Junction, Arizona, now contains 1,000,000 bricks to be used in buildings now in course of erection in Jerome.

Washington street, between Front and First streets, Portland, Ore., is to be paved with vitrified brick, and 52,000 are being piled there in readiness to begin the work.

Larris Cain has filed his second report in the Probate Court at Seattle, Wash., as receiver of the Puget Sound Brick, Tile and Terra Cotta Co. From the report it was found that the business is running at a profit, and it is also very probable that in five months the old bills of the company will be settled. The company now owes \$4,021.32, of which \$2,202.22 is due employees for wages, and the rest is in outside bills. Since being appointed receiver, Cain has sold brick to the amount of \$3,757.30. During that time the running expenses have amounted to \$2,635.60, leaving an excess above expenses of \$1,121.70. The stock on hand has increased in value at the same time \$385, making the total net gain for the first thirty days of the receivership \$1,506.95. The report further states that there is due from D. G. Rudy, the former secretary of the company \$3,084.40. Nothing has been done about this claim as yet, and the receiver wants instructions as to what he shall do about it, and also asks authority to settle a number of labor liens recently filed by employees.

Major Driffl, of the Oxnard sugar factory, of Oxnard, Cal., and Col. Frye, of the Southern Pacific R. R. Co., have secured an option on Thomas Clark's lime deposit in the Upper Ojai, Cal. The option is for a lease for a term of years, Mr. Clark to receive a royalty of ten cents a ton, and the sugar company to do all the handling of stock from first to last. Tests will have to be made, however, of the lime to see if it is of a suitable quality, and whether the deal will be made or not will depend upon the success of these tests. If the deal should be closed the railroad will be extended from Nordhoff to the foot of the grade, and the limestone will be "trolleyed" from the deposit to the cars at that point. The limestone will be shipped to the kiln of the sugar company at Oxnard, Cal.

Work was delayed for a few days on the Hawthorne school building at Spokane, Wash., owing to the inability of the contractor to get pressed brick fast enough to carry on the work.

Mitchell Bros. are burning another large kiln of brick at Ventura, Cal.

The brickyard near Davenport, Wash., will soon turn out from 300,000 to 500,000 brick.

Fitzsimmons & Co., Prescott, Arizona, have fired the largest kiln of brick ever burned by them. The kiln contains half a million brick.

A CITY'S LIABILITY FOR BAD BRICK IN A SIDEWALK.

Suit was brought against the city of South Bend, Ind., recently, to recover damages for injuries sustained by a woman who stepped upon a loose brick in a sidewalk, which turned under her foot. The special findings of the jury showed that this particular defect was not known to the city, and, under these circumstances, the Appellate Court held that it would be a severe rule which would require a city, by its officers, to examine each brick in a sidewalk, to ascertain its condition when there was nothing to indicate a defect in the brick itself or in the manner in which it was laid, and where the walk was even.

PEORIA GETS THE NEXT CONVENTION.

G. C. Stoll, secretary of the Illinois Clayworkers' Association, announces that the next annual convention will be held at Peoria, some time in January. Peoria has been after the convention for the past two years, and the local committee, headed by the mayor, promises to afford the best of entertainment for the delegates. Peoria's central location ought to insure a large attendance.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED—Position as enameled in brick or tile works. Practical man, several years experience in pottery and brick work. Address 91 c "B" care Clay-Worker.

POSITION WANTED—Manager or superintendent; can take charge of entire plant. Fire, paving, red and other products. Address 91 c J. H., care Clay-Worker.

FOR SALE—A brand-new 2-mold Dry Press, 9-foot dry pan; 3/4-yard Marion Steam Shovel (good as new.) Big bargain. Easy payments. 91 c G. P. B. Co., care Clay-Worker.

FOR SALE—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address 11 f d JESSE T. MORGAN, Wilkes-Barre, Pa.

FOR SALE—Two second-hand "Martin" Clay crushers. One second hand heavy "B" steam power brick machine, as good as new. The HENRY MARTIN BRICK MACH. MFG. Co., 82 d Lancaster, Pa.

WANTED — Position by a practical brick and tile superintendent, thoroughly understands the business in all departments; can give the best of references. Address 91 c T. A. L., care Clay-Worker.

WANTED—A first-class paving brick burner, also one who understands burning common and buff brick, down draught kiln. None but a steady man need apply. Address 91 c G. care Clay-Worker.

WANTED—A large bed of first-class buff clay. Must be well located either on a navigable stream or on a railroad. A deposit near the Northern lakes would be preferred. A reasonable price will be paid for desirable property. Send sample of clay and particulars as to the extent of deposit, location, price, etc. to 91 d SCULPTOR, care Clay-Worker.

WANTED—Position as superintendent or burner of dry press brick plant by one who is thoroughly practical in every department of manufacturing same. No. 1 references. 91 c W. C. M., care Clay-Worker.

WANTED—Position as superintendent or manager by man of 15 years experience. Have good position, but on account of bad health of family would like to change. Address SUPERINTENDENT, 91 c care Clay-Worker.

WANTED—A practical man, with sufficient capital to handle a brick and tile plant, costing some \$25,000. The plant is fully equipped for dry press common brick or tile, abundance of good clay and a growing market. EARL PARK ELEVATOR & TILE CO., 91 c Earl Park, Benton Co., Ind.

WANTED—An experienced man to take charge of a stiff-clay shale building brick plant. Must understand the business in all departments, particularly the burning and know how to manage men. A good reliable man can secure desirable and permanent situation. None other need apply. References required. 91 d AUGER, care Clay-Worker.

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I have two Simpson Dry Presses, that are just as good as new, that I will sell for \$1,500 each, F. O. B., Cleveland, Ohio. These presses cost \$3,500 each. FRANK B. MANY, 809 Cuyahoga Bldg., Cleveland, Ohio.

ARE YOU LOOKING FOR A

Steam Brick Dryer?

We have the Simplest, Cheapest and Best.

No Cars. No Tracks. No Fans. No Tunnels. No Brickwork.

Will dry your Bricks in 12 hours. For particulars, address

Martin Dryer Co.,

P. O. Box 87.

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That's Where We are With Our

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Chicago Brick Machinery Co., 225 Dearborn St.

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FOR SALE—Brick and tile plant located in central Illinois. Have made and sold at good prices for cash, 400,000 tile since April 1st to July 1st, 1898. Two railroads in the yard. Kiln capacity 300,000 brick. Best of shale, vitrifying at a low temperature. Coal 50 cents per ton on the yard. Other business interest demanding attention cause for wanting to sell. No competition. Address **BRONAUGH BROS.**
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WANTED—A party thoroughly experienced in the manufacture of brick from coal measure fire clays, mill brick, vitrified brick, pipe, etc., with some capital, to combine and form a company to work some veins of fire-clay in connection with a coal mine. Every advantage as to location and cheap production, and fuel. Clays and coal within 200 miles of Baltimore and Washington on B. & O. R. R. Address **E. COAL COMPANY,**
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One 22x30 centre crank, Throtting governor, heavy duty engine; the same is new, never having been set up. Will sell cheap for cash. Estimated horse power 250.
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A well equipped Virginia brick plant, near a large city, affording a good market. The present price of common brick is \$7 a thousand, Pavers \$9 to \$10. Abundance of excellent clay and cheap fuel. A splendid opportunity for a practical, industrious man. For full particulars. Address **"WIDOW,"**
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One Monarch machine, only used one short season.
One extra heavy Quaker machine in good order.
One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.
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I have about 225 acres, 100 of which is clay suitable for the finest brick, both red and buff, runs 25 feet above navigable water on which it fronts 500 yards. Newport News, Norfolk, Portsmouth and Hampton, and Fortress Monroe all terminal of railroads reaching to every section of the country and which are rapidly forging to the front, use 100 or more millions of brick a year and are distant about 35 miles. The soil or clay on all the water routes is quite sandy and unfit for making the finest grade of brick, for which my clay is especially suited. There is also a large demand among the truckers around Norfolk for tile which they have to get elsewhere. There is no clay in Virginia better for that purpose than mine. I have a large brick mill supplied with water from an unfailing pond. House 30 by 60, three stories and an annex 24 by 40, two stories; dwelling house, kitchen, out houses of every description, barns, stables, quarters for hired hands, etc., 50 or 60 acres of land cleared, balance heavily timbered. Wood costs at kiln \$1.50 per cord, labor 50 to 75 cents per day. Lumber \$8 per M, transportation \$1 per M. I will take for the entire property, all of which is in excellent order \$6,000—\$2,000 cash and balance in five annual installments, with interest at six per cent. The cleared land is in excellent state of cultivation all in growing crops. The property lies on the James River. Address
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No Dry Press Brick Plant Complete

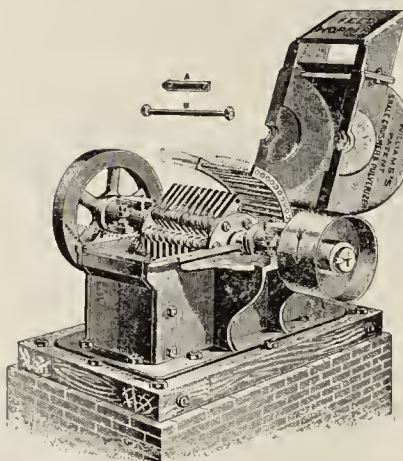
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A Clay Pulverizer of Wonderful Capacity:



WILLIAMS'S SHALE AND CLAY PULVERIZER, with Clay Steamer Attached.

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GENTLEMEN:—In reference to the No. 3 Pulverizer which we purchased of you last winter, and have had in operation since the latter part of February, almost continuously. My son, Warren, under whose advice and recommendation it was put in, has this to say concerning same: "The Williams Pulverizer is doing its work with entire satisfaction—it prepares clay for three machines; each making 22,000 common brick in a day of 10 hours. Speaking in the vernacular—'It has a cinch.'"

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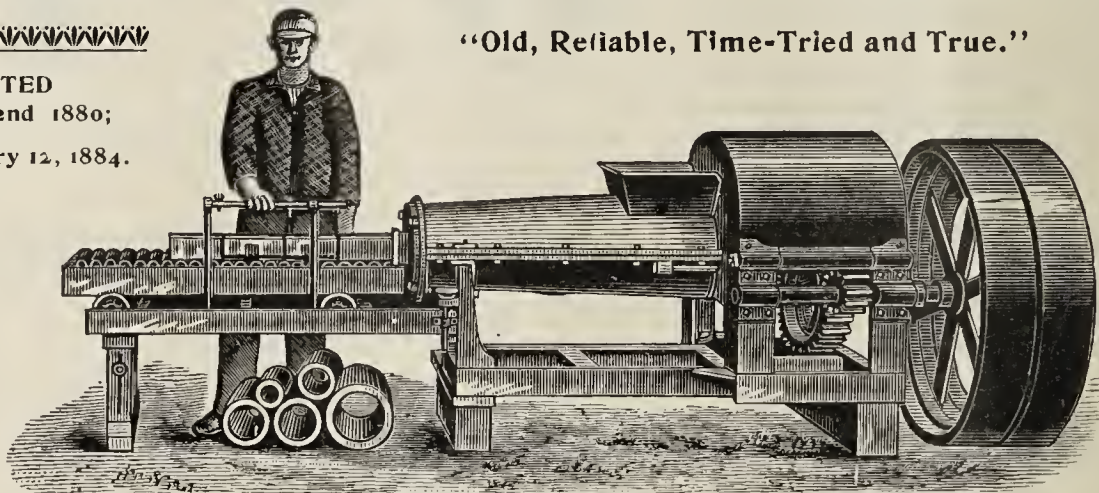
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PATENTED
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P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the haeks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we exceed none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

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We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.
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Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

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Wooden Pallets,

WE CAN FURNISH YOU THE BEST

We make all Styles of

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Get good Pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices.

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NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.

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FOR SALE — \$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN, Room 13 Palmer House, Chicago, Ill. 3 t f d

FOR SALE — One Barnhart style A, 1 1/2 yard steam shovel, with a one yard dipper, slightly used. First class condition.

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FOR SALE CHEAP. — One Second-hand, double die Columbian Repress; practically as good as new.

One Quaker Horse-power Brick Machine, in good order.

One Monarch Brick Machine, only used one short season. All in running order.

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6 spring brick trucks.

Lot shafting, belting and pulleys.

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All new or little used, and in excellent condition.

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Two 8-foot dry grinding pans, under gear pan.

One 8-foot, under geared, iron frame wet for wood work.

One new 5-foot wet pan for wood frame.

One Potts stock brick machine.

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Large lot of steel and iron pallets.

Twenty pallet cars.

One 30 H.-P. horizontal tubular boiler.

Lot of boilers, tanks, etc.

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Complete sets including general plan and elevation of works.

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Machine Brick Moulds a Specialty.

PRICES:

Steel bound machine moulds,
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With Steel Lined Heads,
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With Panel Bottoms, solid, 5 cents per brick extra.

With name plates 5 cents per brick extra.

Top irons dovetailed, or crimped if preferred. Handles any desired pattern.

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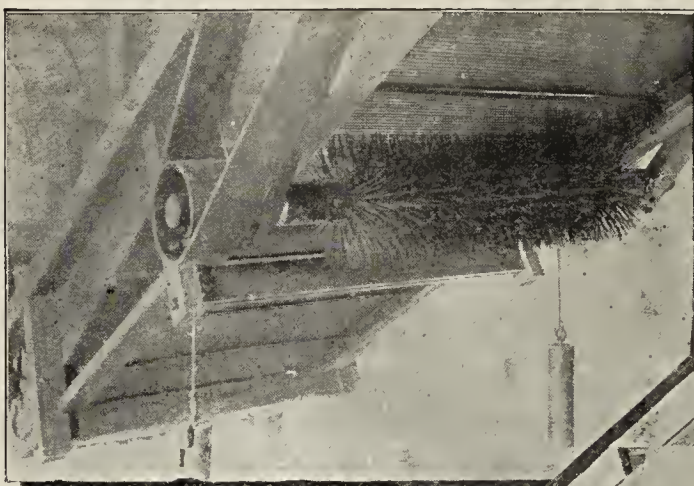
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than save its
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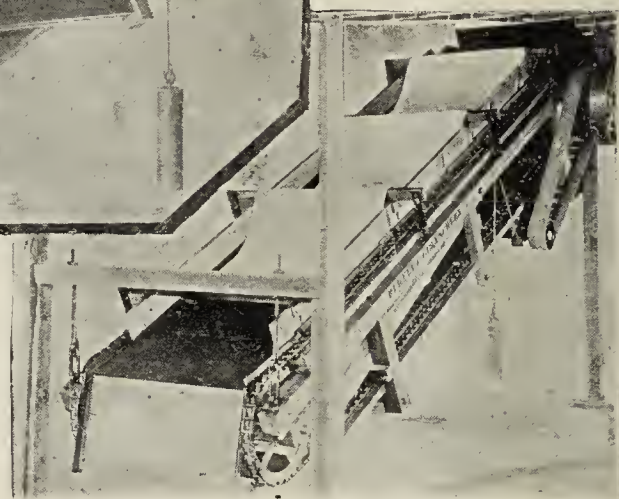


View on underside showing action of Rotary Brush

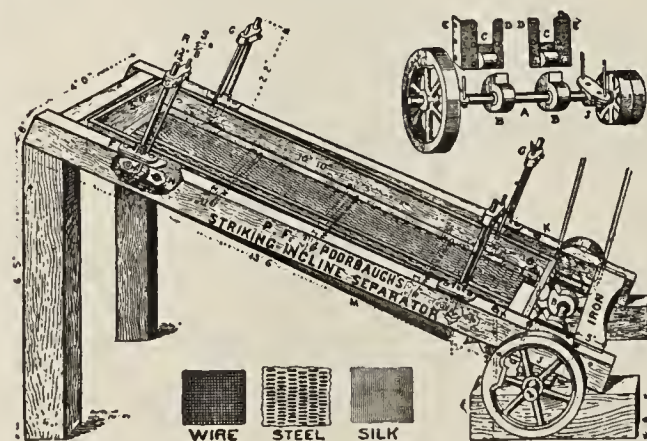
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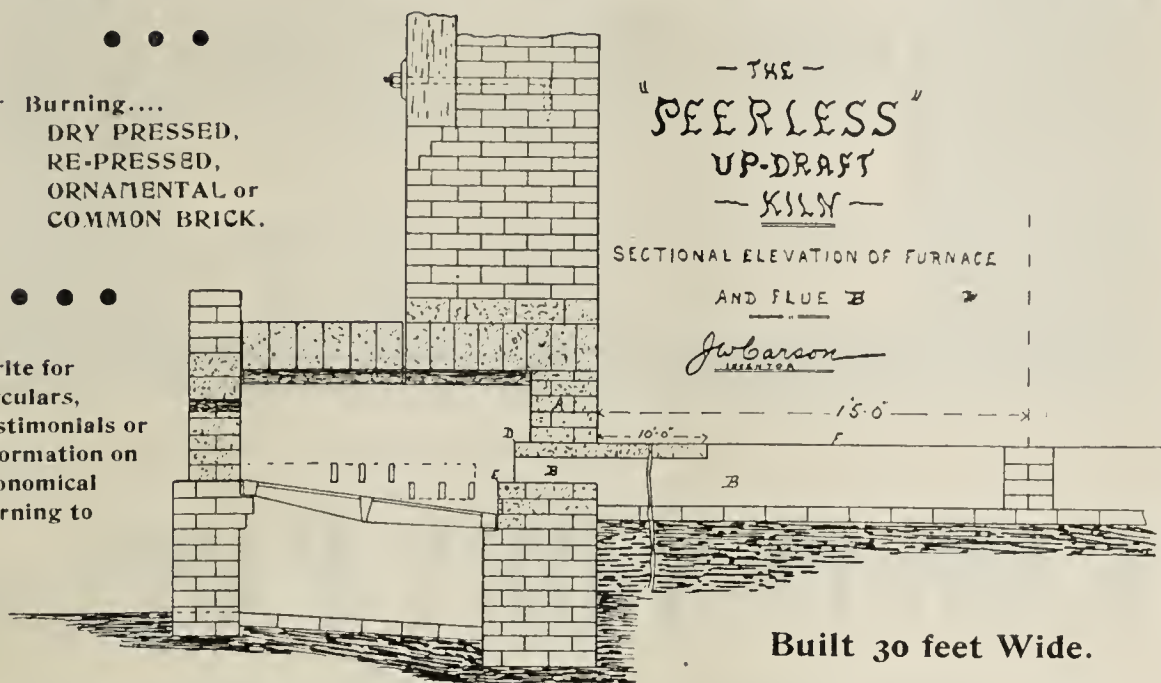
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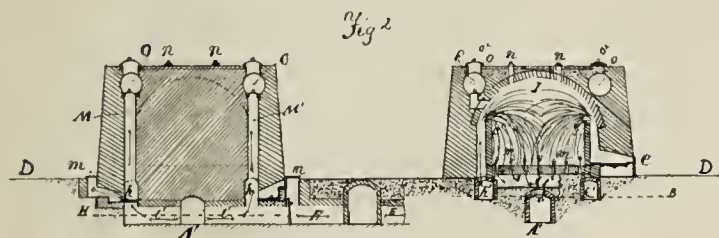
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It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

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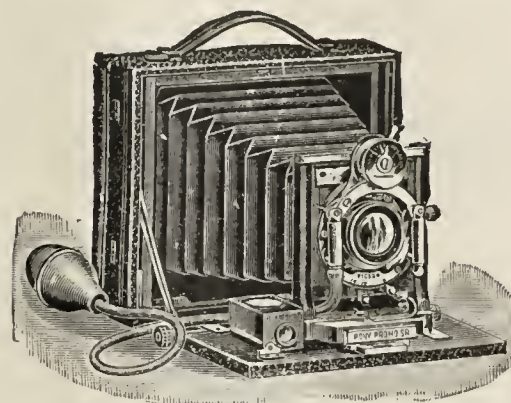


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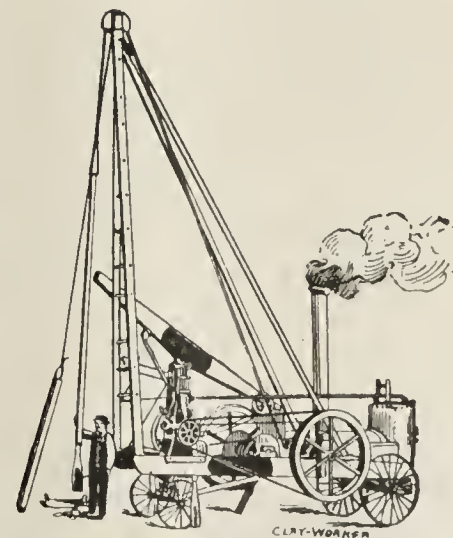
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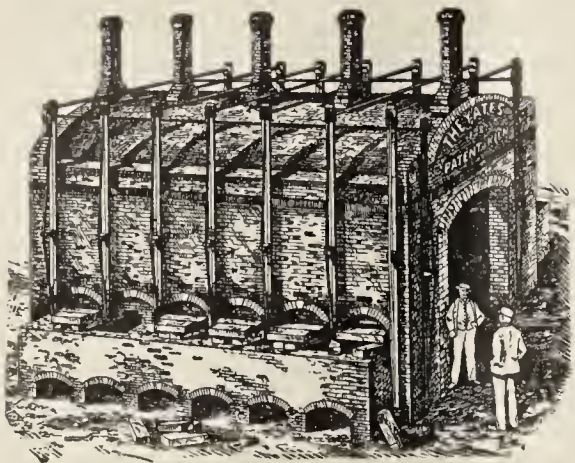
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For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, come and see what we are doing.

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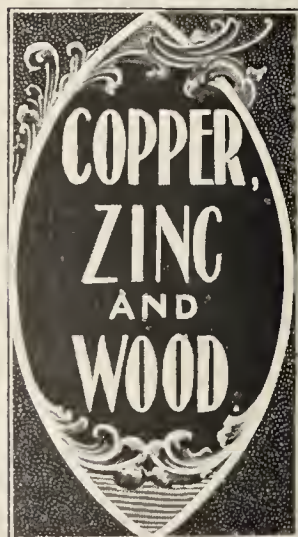
run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

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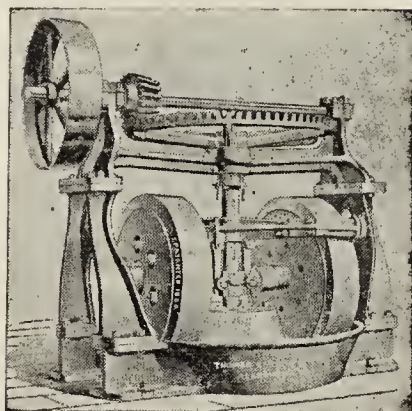
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THE BEST and in the long run the cheapest Dry Pans on the market. They are the cheapest because they are the best. Carlin's Dry Pans are built for service and capacity. Ask those who are using Carlin's Dry Pans and they will tell you they are the best and cheapest pans made. We make several different sizes. If you are going to buy a Dry or Wet Pan and want the best value for your money don't fail to get our prices.

We also sell **Engines, boilers, Pallet cars, Revolving derricks, Conveyors, Hoisting machinery, etc.** Send for prices and terms.

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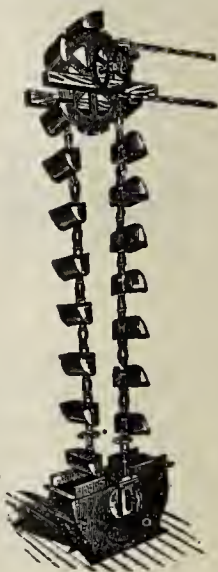
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**F. H. C. MEY,
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Approved Appliances for
Elevating, Conveying and Transmission of Power,
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THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



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**Make
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Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

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NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

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*Daily.		

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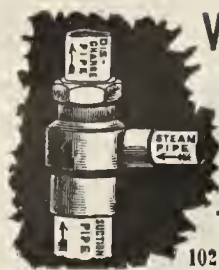
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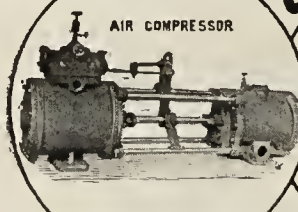
G. W. Hayler, D. P. A., Indianapolis, Ind.
D. G. Edwards, Passenger Traffic Manager.

S. GEYSBEEK,

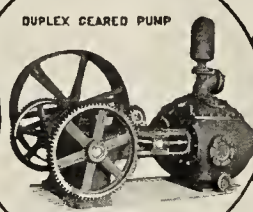
Ceramic Chemist.

New Brighton, Pa.

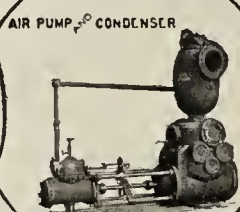
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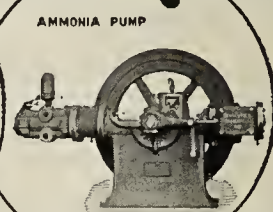
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Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

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Write for Circular and prices.

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78 South Pennsylvania St.,

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Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

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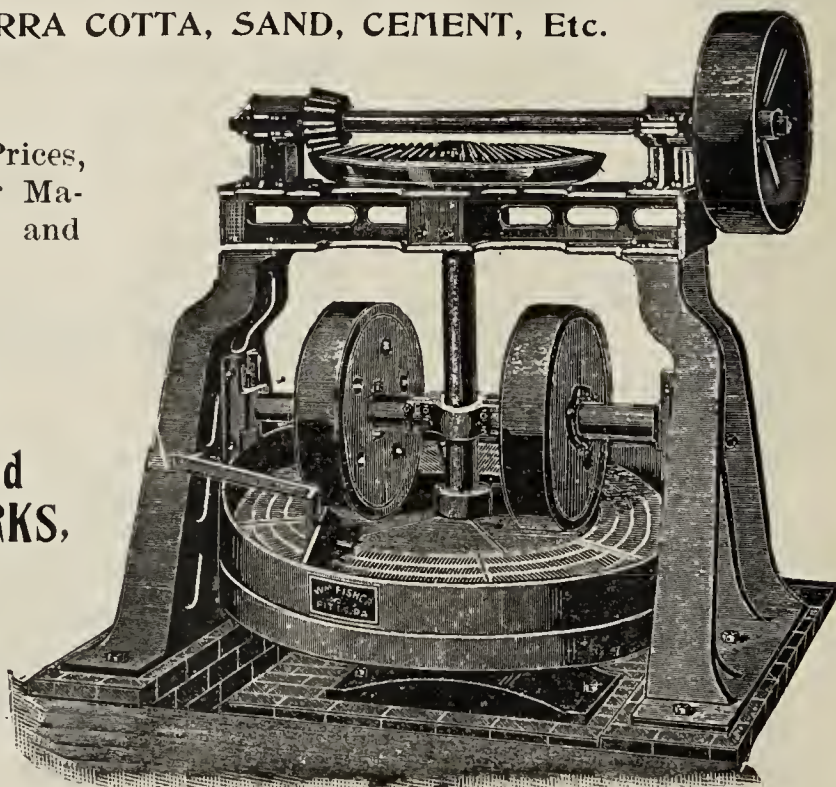
When writing for Prices,
state kind of Clay or Ma-
terial to be ground and
capacity required.

••••

FISHER ENGINE FOUNDRY and MACHINE WORKS.

Phillips & McLaren,
Proprietors,

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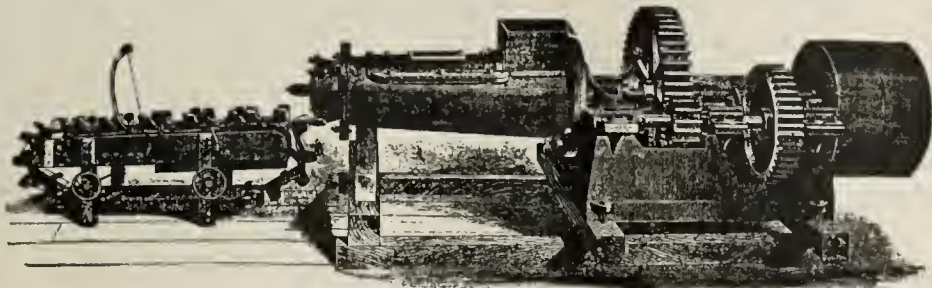


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Successors to NOLAN, MADDEN & CO.,

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Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

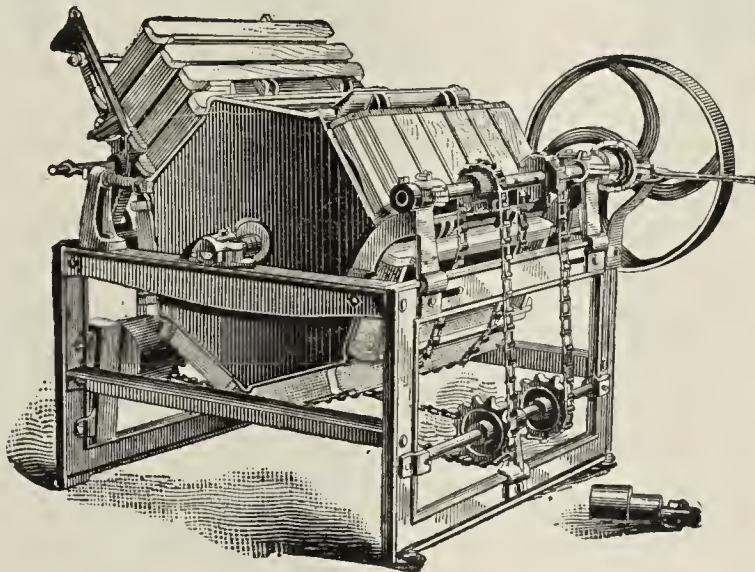
MADDEN & CO., Rushville, Ind.

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



The case of Newton vs. Buck, has again been decided, February 4, 1898, by Judge Cox, in the United States Court, holding that Newton is the owner of patents, Nos. 284,115; 301,087; 272,698; and 407,030, and has the exclusive right to manufacture machines under these patents, and entitled to an injunction against Buck and all persons claiming through or under him, from making, using or selling the Buck machines, and for damages for past infringements. This is absolutely the end of the long litigation between Newton and Buck and every point is decided in favor of Newton.

We own and control nine patents, and all sanding machines employing either the cylinder or the feed rack, infringes some one or more of these patents, and all persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages against all infringements.

Elevators

For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish
RUBBER,
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COTTON
BELTING.

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For long and short
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BUCKETS,
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Bricks, Tiling, Pottery?

WE know ALL about
SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

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Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road.

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Through tickets sold to all points in the United States and Canada.

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No. 20 Passenger..... 7:00 a. m.
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Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

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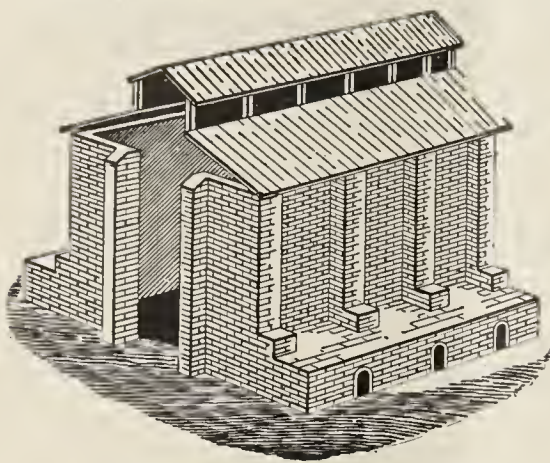
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HAVE A SHARP
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SEND FOR
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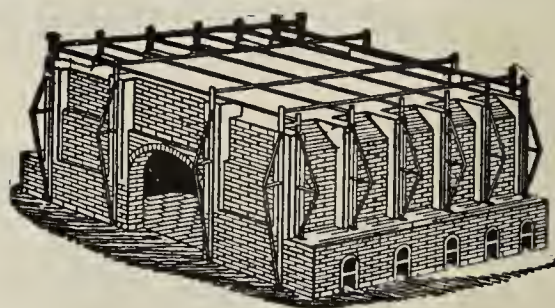
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WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

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LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.

The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

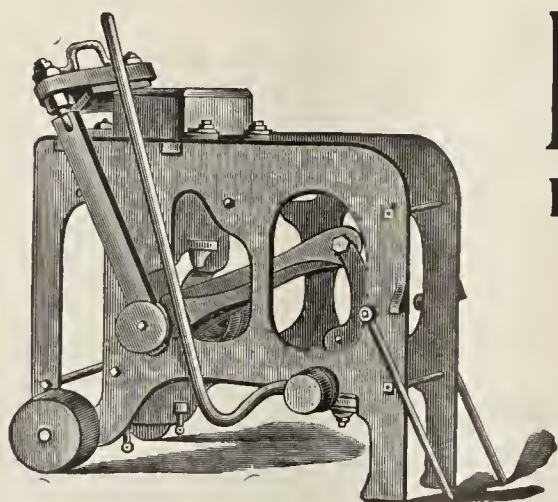
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

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RED BRICK PRESS.

GEORGE CARNELL,

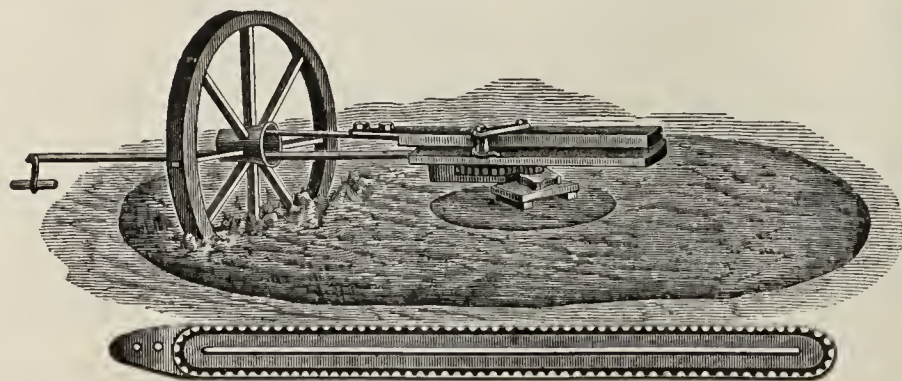
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PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

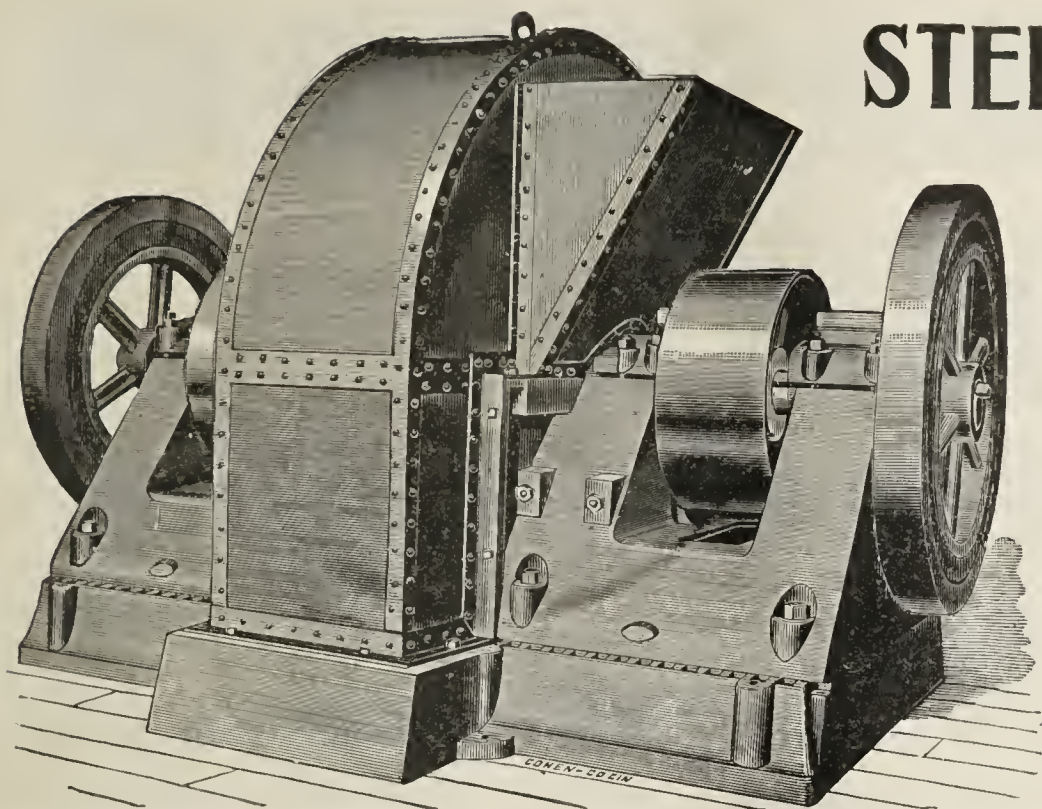
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,
Aurora, Ind.

The "New South" Brick Machinery

Manufactured by

J. C. STEELE & SONS,
Statesville, N. C.

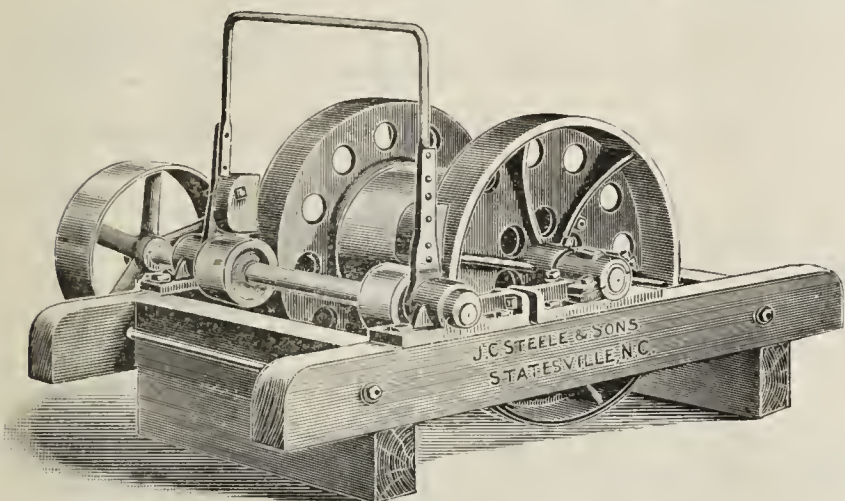
...

Twenty-four outfits of Brick Machinery sold in six months, besides many of our new Double Friction Winding Drums (of which cut is here shown,) and lots of our Iron Frame Revolving Clay Cars, not to mention Brick Trucks, Automatic Cutters and other Brickyard equipments.

Let us make your acquaintance.

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J. C. STEELE & SON, Statesville, N. C.



New Double Friction Winding Drum.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Horseheads Brick Co., N. Y., August 13, 1898.

Respectfully yours,

R. G. EISENHART, Treas. and Gen. Man.



This kiln has now been in operation nearly two years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at \$2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

Address **H. HAIGH, Catskill, N. Y.**

The Lehmann ^{Portable} _{Continuous} Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

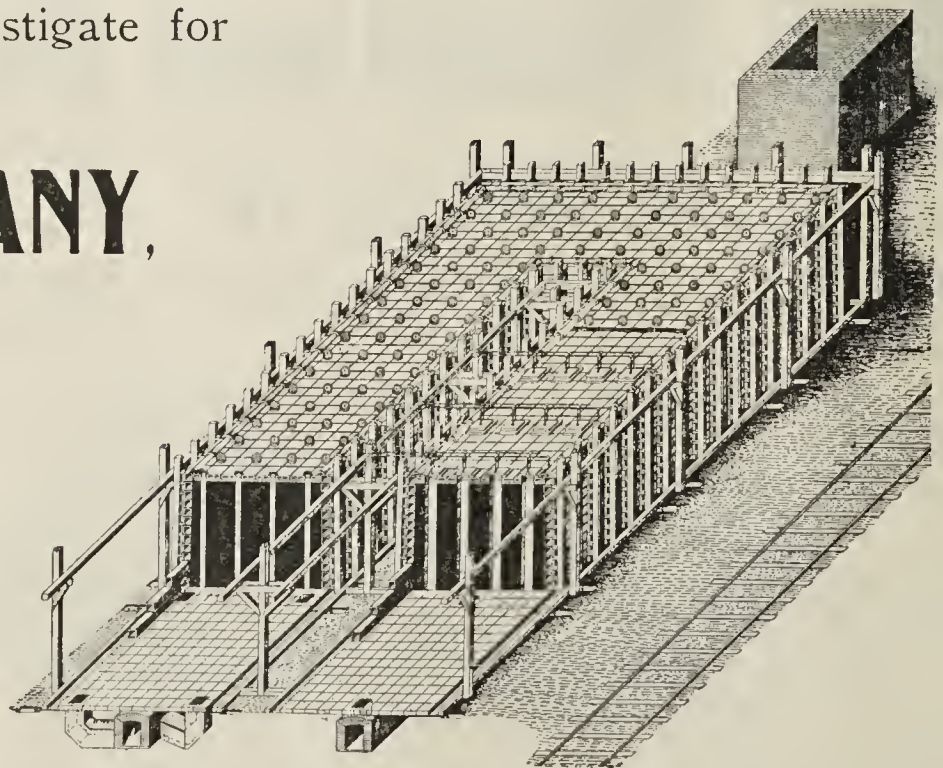
F. LEHMANN & COMPANY,

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Kiln Builders, Consulting Clayworker Engineers,
Plans and estimates furnished for Brick, Lime and
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THE LEHMANN CONTINUOUS KILN has
been in successful operation with crude
oil during the last year and can be adapted
to all kinds of fuel.



Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

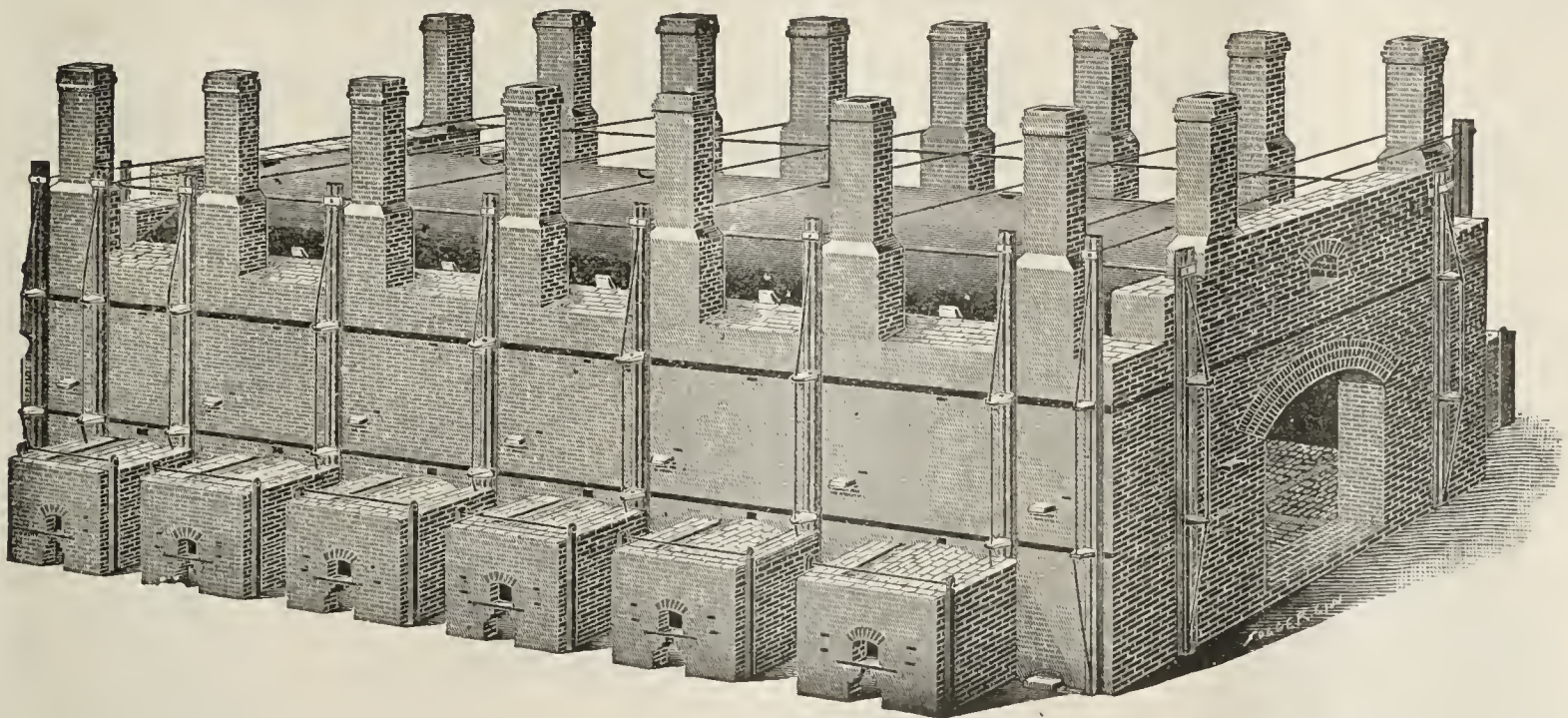
R. B. MORRISON & CO.,

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The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

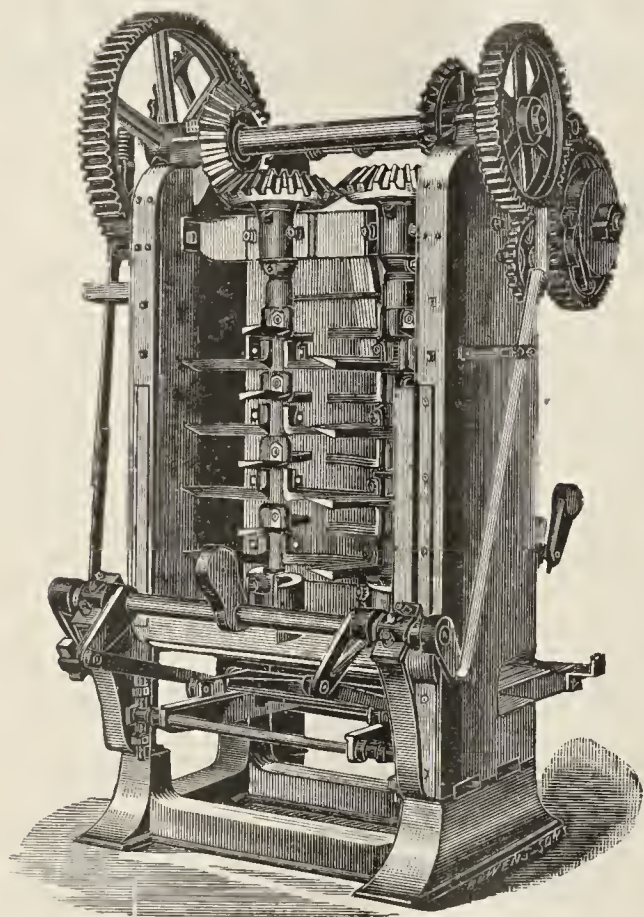
We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



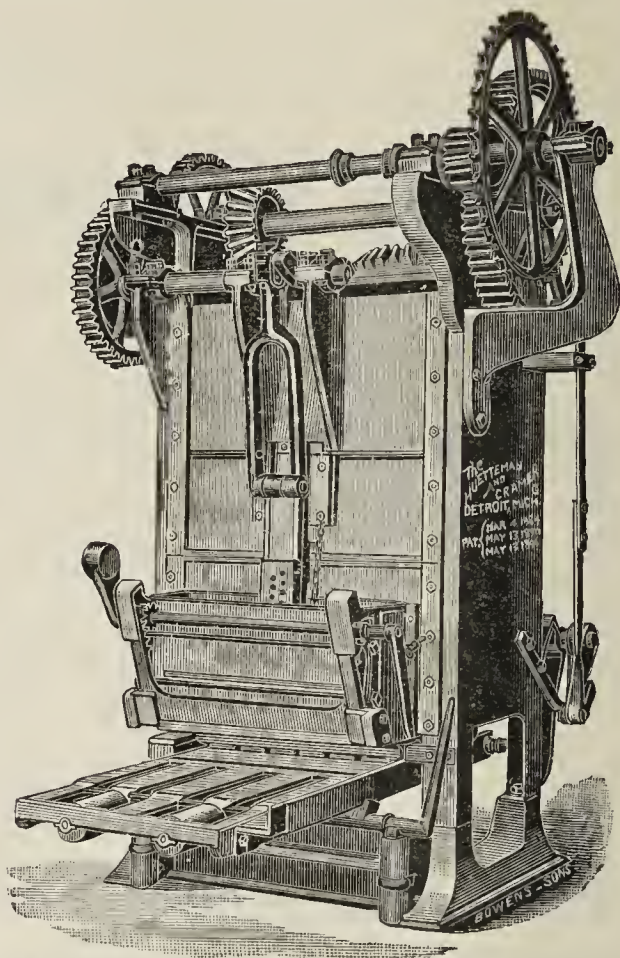
It is made entirely of iron and steel thus being very Strong and Durable. Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE
AND PRICES TO

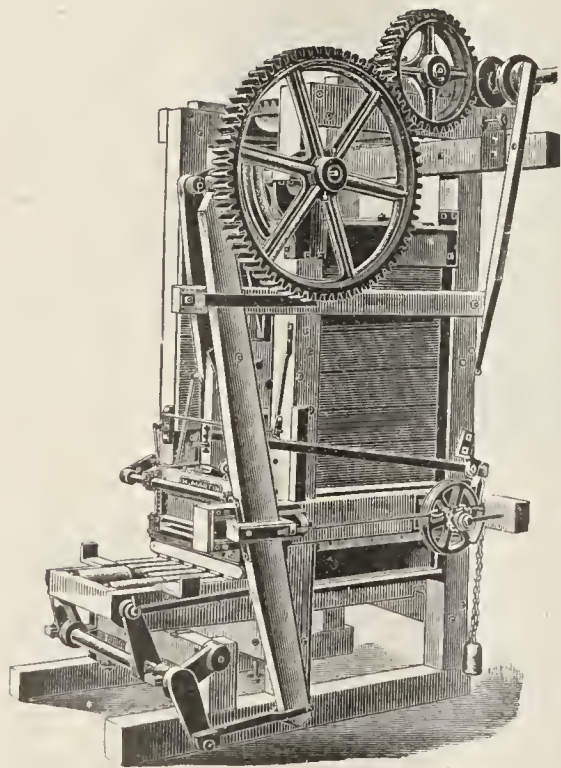
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Manufacturers of the Duplex Brick Machine and general outfit for
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The Famous "Martin" Steam Power Brick Machines.



Their capacity depends entirely upon the facilities for feeding the machine and taking care of the brick when made.

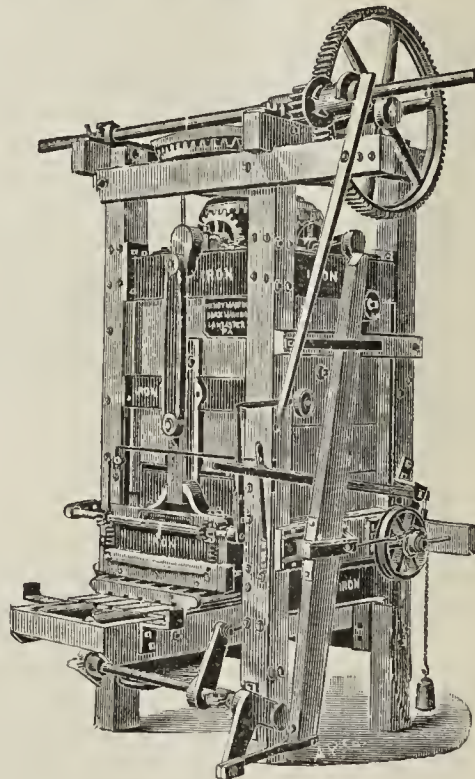
They are not adapted to the manufacturer of

GOLD BRICK

From Sea-Water but are capable of turning out 50,000 first-class building brick in 10 hours from any kind of clay.

Their merits are well established.

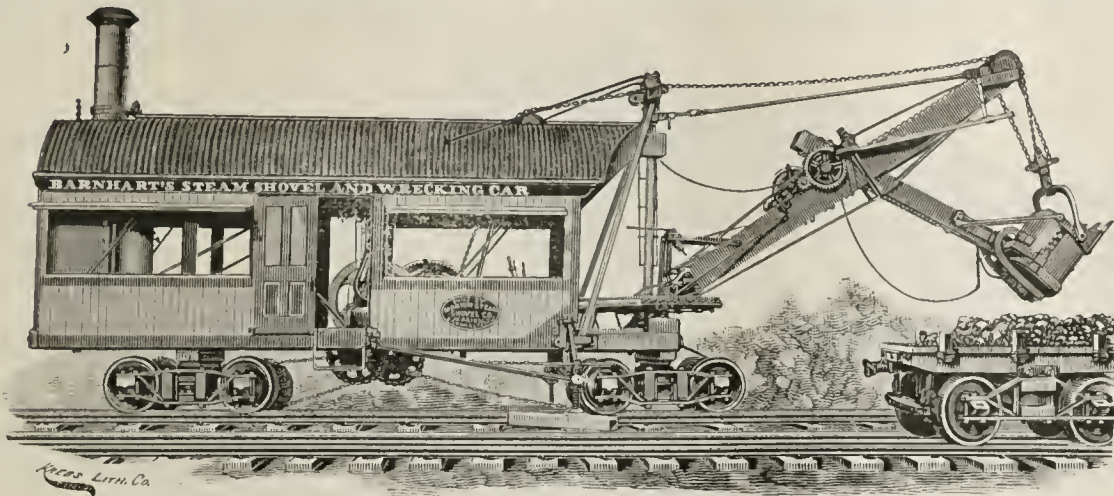
**The Henry Martin
Brick Machine Mfg. Co.,**
Lancaster, Pa., U. S. A.



CABLE ADDRESS "MARTIN LANCASTER,"
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Send for Illustrated Catalogue.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

PROMPT ATTENTION TO
ALL CORRESPONDENCE.

UP=TO=DATE MACHINERY

MEANS IMPROVED MACHINERY,

Machinery that is more economical because it has greater capacity, and cheaper because it is more durable and runs easier, thus requiring less power and fewer repairs than old style machinery.

Taplin, Rice & Co.,

AKRON, OHIO.

Manufacture a full line of Up-to-Date Clayworking Machinery.

Our Specialties: SEWER PIPE PRESSES, DRY and WET PANS, with wrought steel construction frames; also Potters Wheels and Dies for anything that can be made out of clay. Machinery of all kinds.

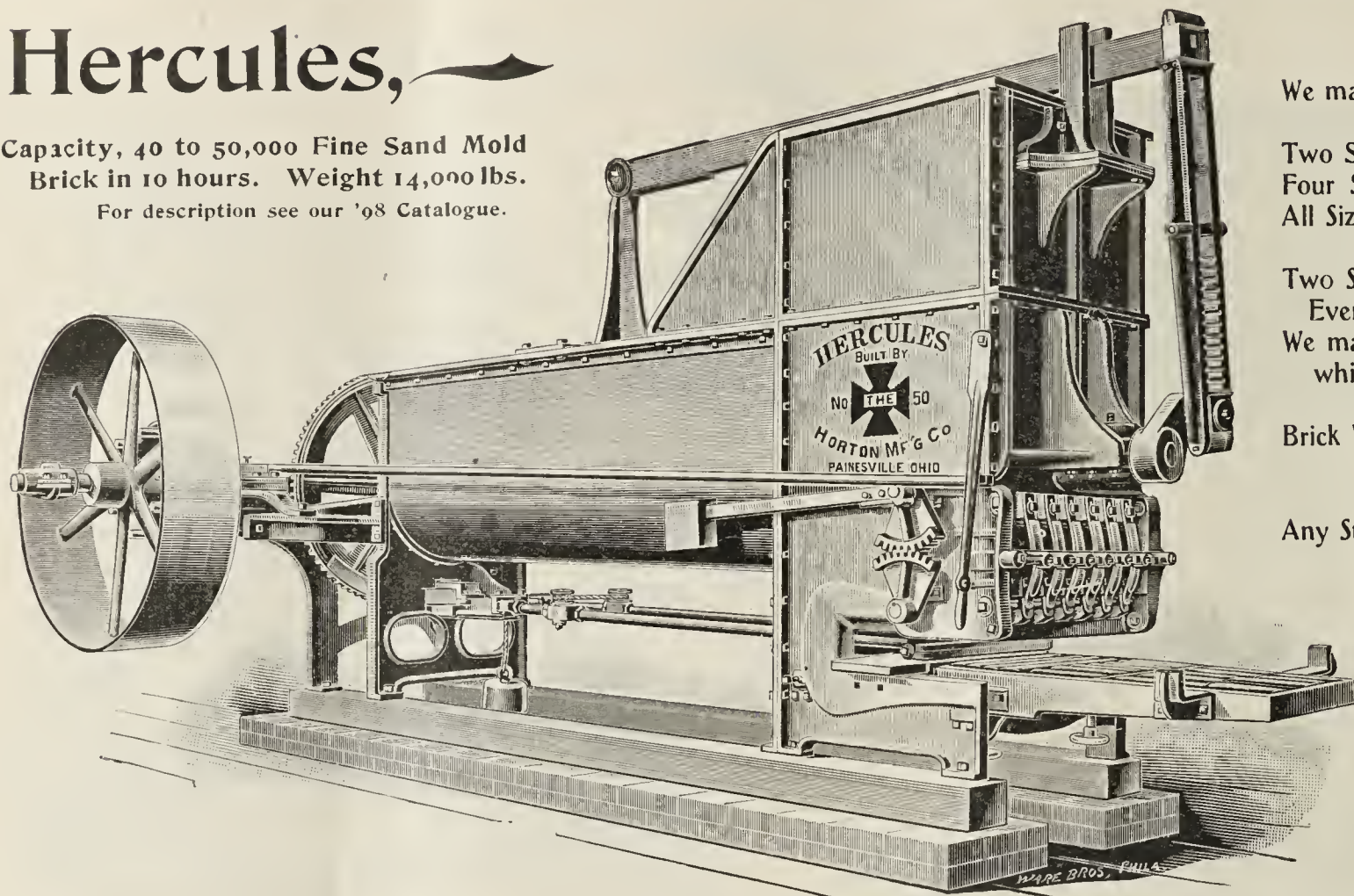
NO TROUBLE TO QUOTE PRICES.

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Do You Want the Best Machine on Earth?

Hercules,

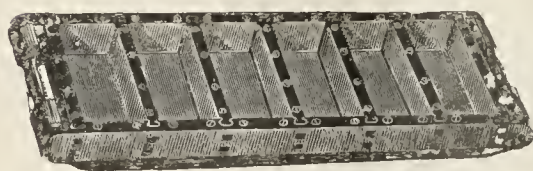
Capacity, 40 to 50,000 Fine Sand Mold
Brick in 10 hours. Weight 14,000 lbs.
For description see our '98 Catalogue.



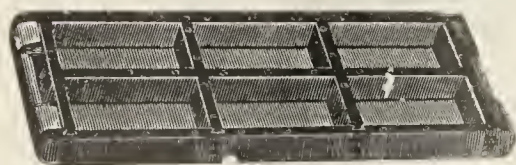
We make Seven Styles
of Brick Machines.
Two Styles Mold Sanders.
Four Sizes of Disintegrators.
All Sizes of Pug Mills.
All Styles of Elevators.
Two Styles of Hoists.
Everything in Dump Cars.
We manufacture Molds,
which have no equal in
Quality and Price.
Brick Wagons.
Dump Tables.
Brick Pallets.
Any Style of Barrow
used on a Brick Yard.
Double and Single
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and Frames.
Shafting, Hangers,
Pulleys, Etc.
Boilers and
.... Engines.

The HORTON MANUFACTURING CO., Painesville, Ohio.

Do YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see?"

We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for

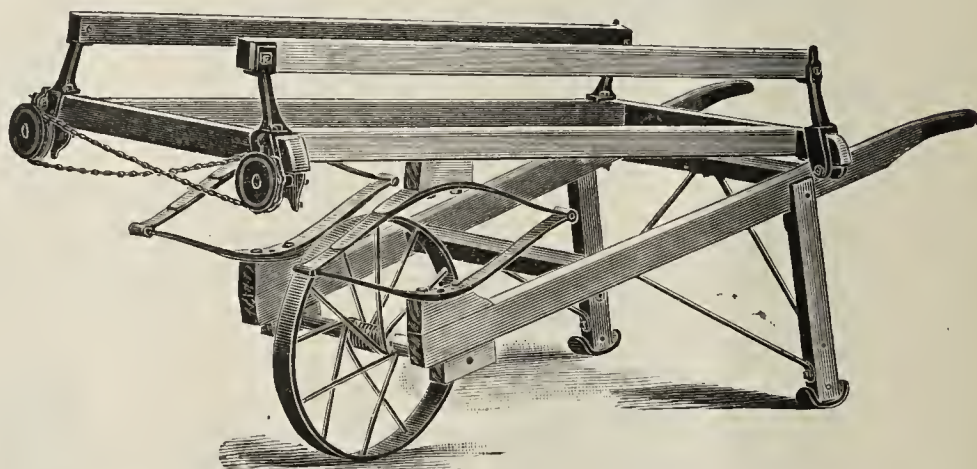
future delivery desired now. We make the best

➔ Moulds, Trucks
and Barrows,

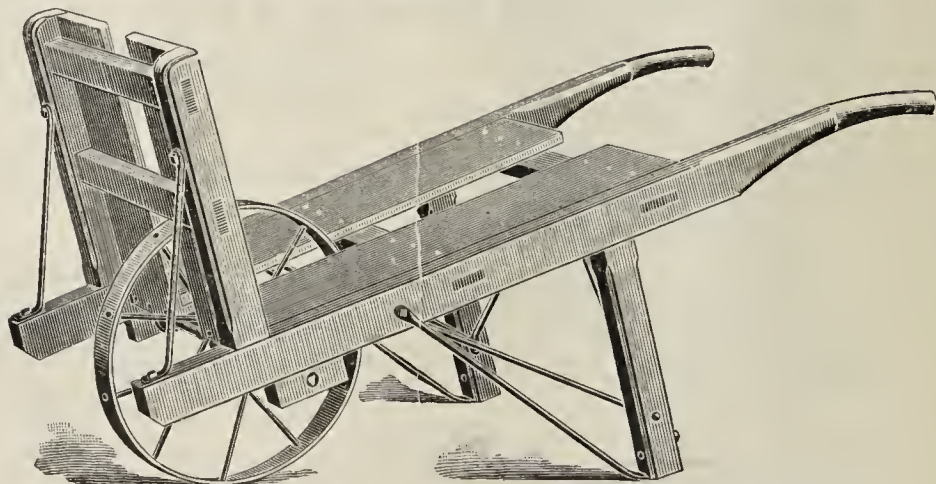
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.



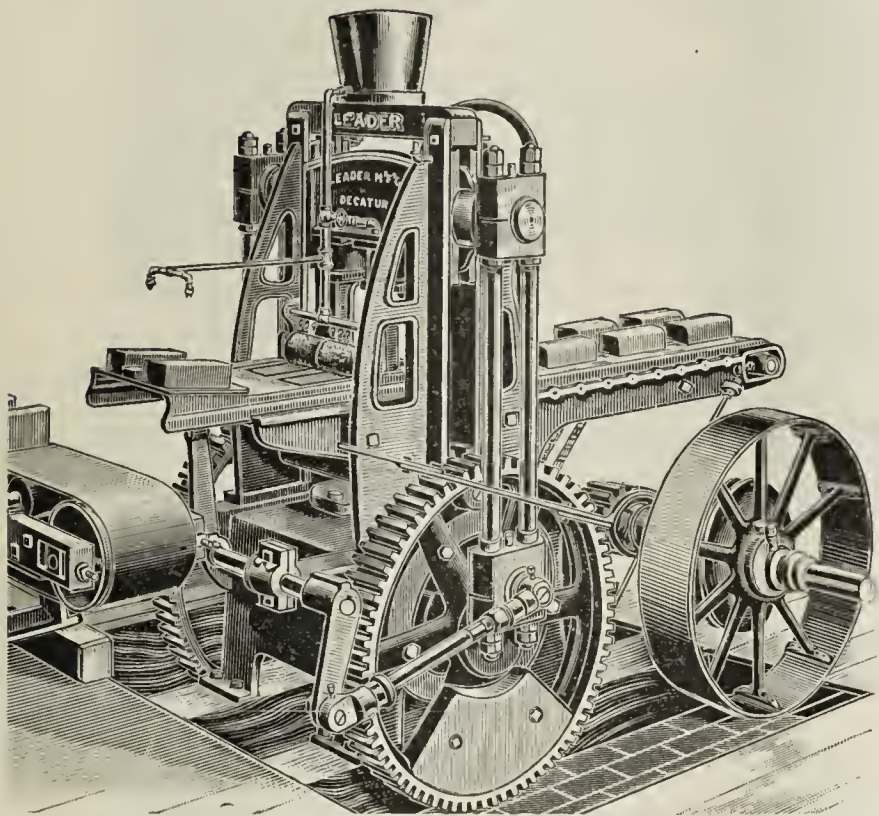
No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00 } For next 30 days.
No. 3 Same Barrow on Springs, " 6.25

Leader Brick Machinery

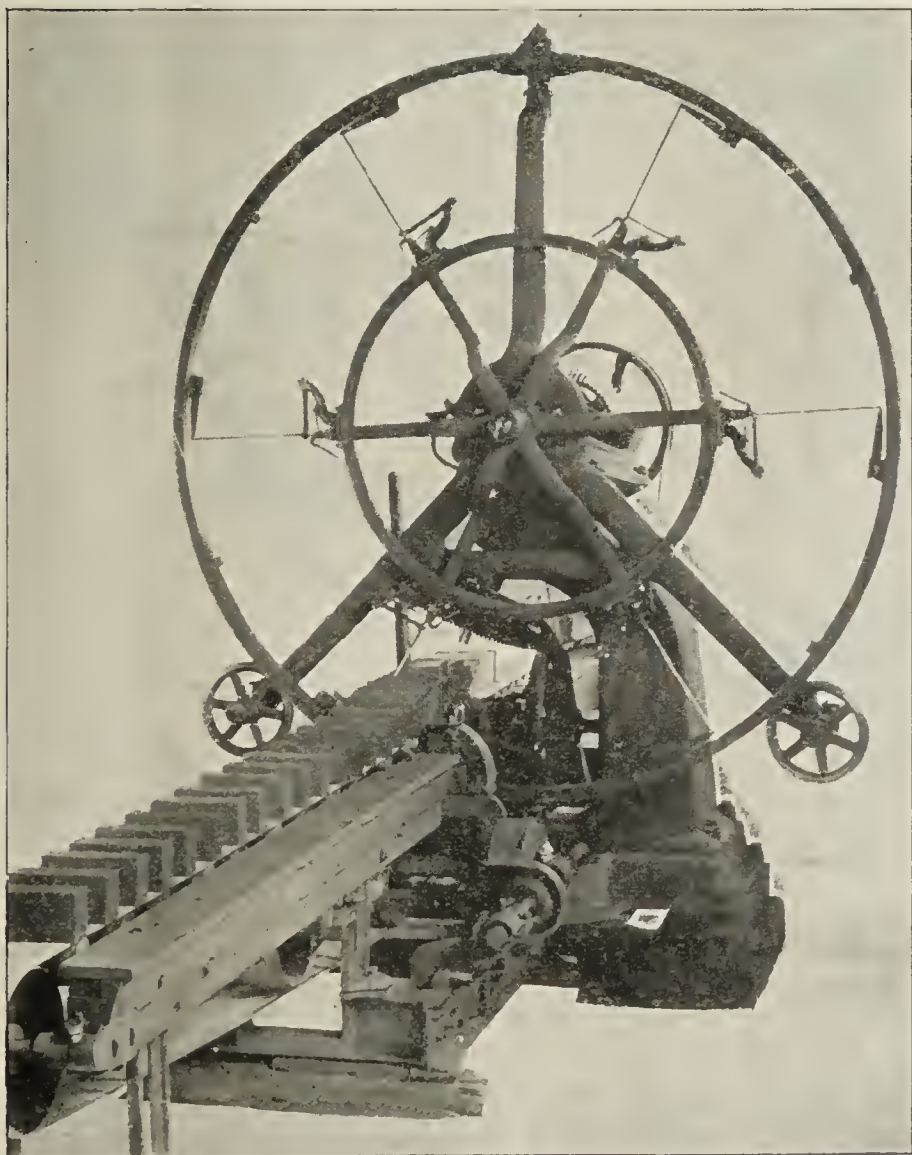
Is Not Surpassed.



Is cheaper in the Long Run
and Costs no More at the
Beginning than the other Kind.

The Leader Reprass is a double die machine of liberal dimensions, simple, convenient, effective, durable and light running, and is fully described together with our brick machines in sectional Catalogue number 101, which will be mailed free to any address.

LEADER MANUFACTURING CO., Decatur, Ill.



The Chambers Automatic Side-Cutter.

Automatic Side-Cutter For Stiff-Tempered Brick Machines.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

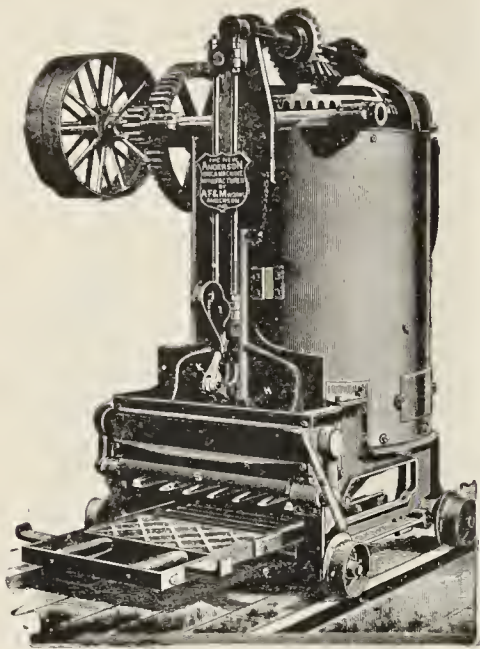
The machinery is above the dirt and all gearing encased.

MANUFACTURED and
GUARANTEED. . . .

Chambers Brothers Co.,
PHILADELPHIA, PA.

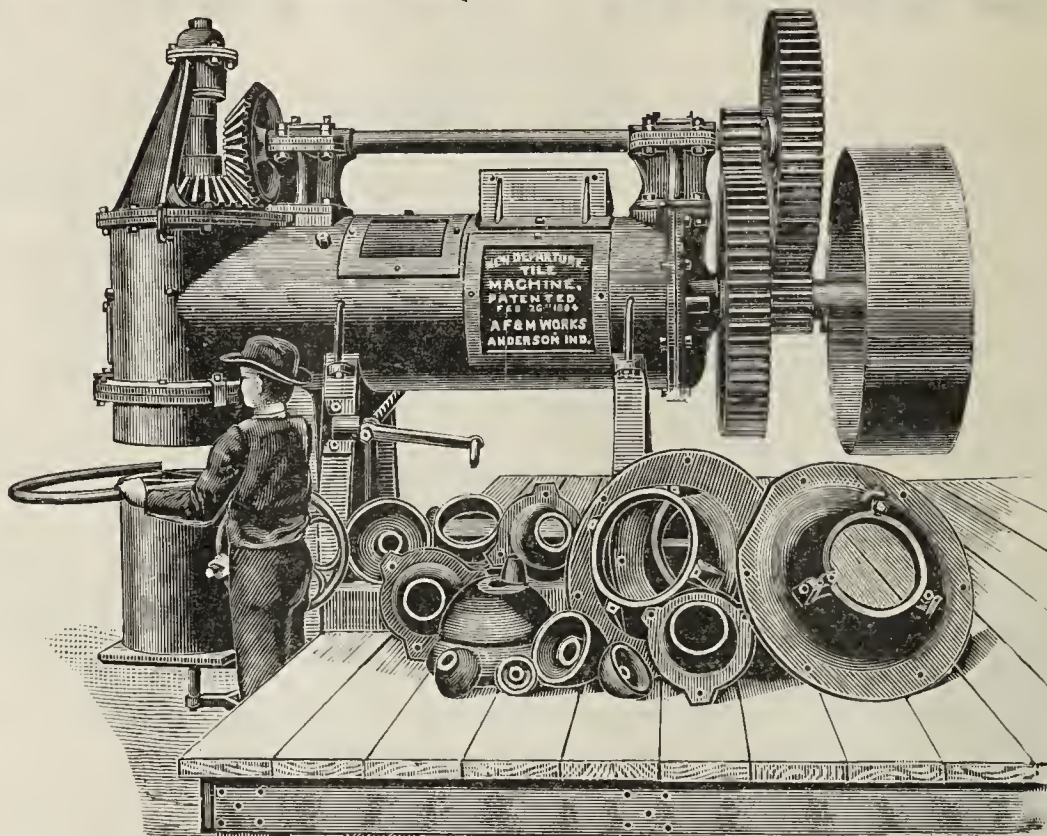
New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

The Past and
the Future



In the Past

Cutting
BICYCLES.

Have given universal satisfaction.

In the Future we agree to protect you by our liberal guarantee.

Six models to select from \$35, \$45, \$60.

We refer by permission to the editor of the CLAY-WORKER.

Get our Catalogue.

These wheels are fitted with gear cases and the Willits Rear Hub Brake.

A full line of Cycle Sundries.

Get our Sundry Catalogue.

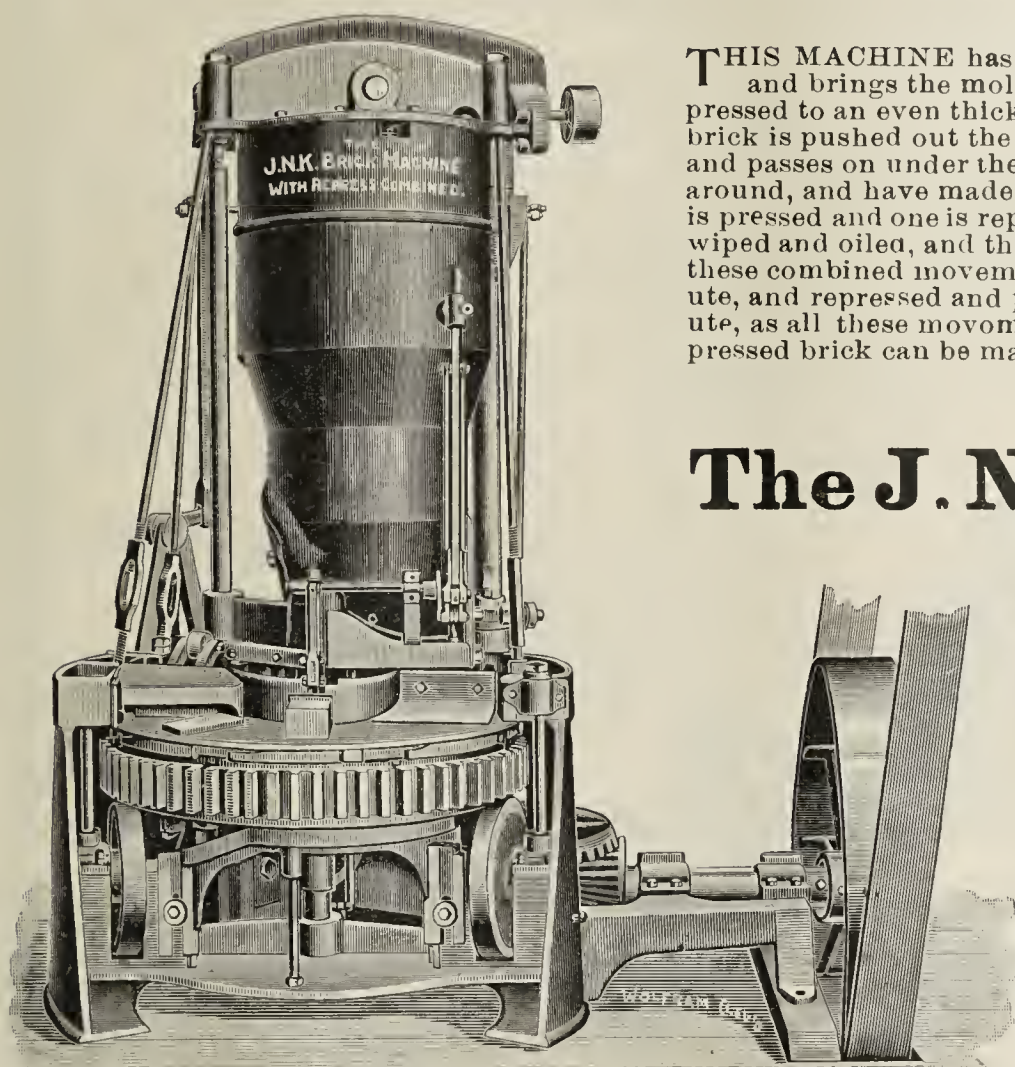
HAY & WILLITS MFG. CO.

West 18th St. and Belt Railroad, INDIANAPOLIS, IND.

A GREAT IMPROVEMENT IN STIFF MUD
BRICK MACHINES

The J. N. K. Brick Machine

With Repress Combined.

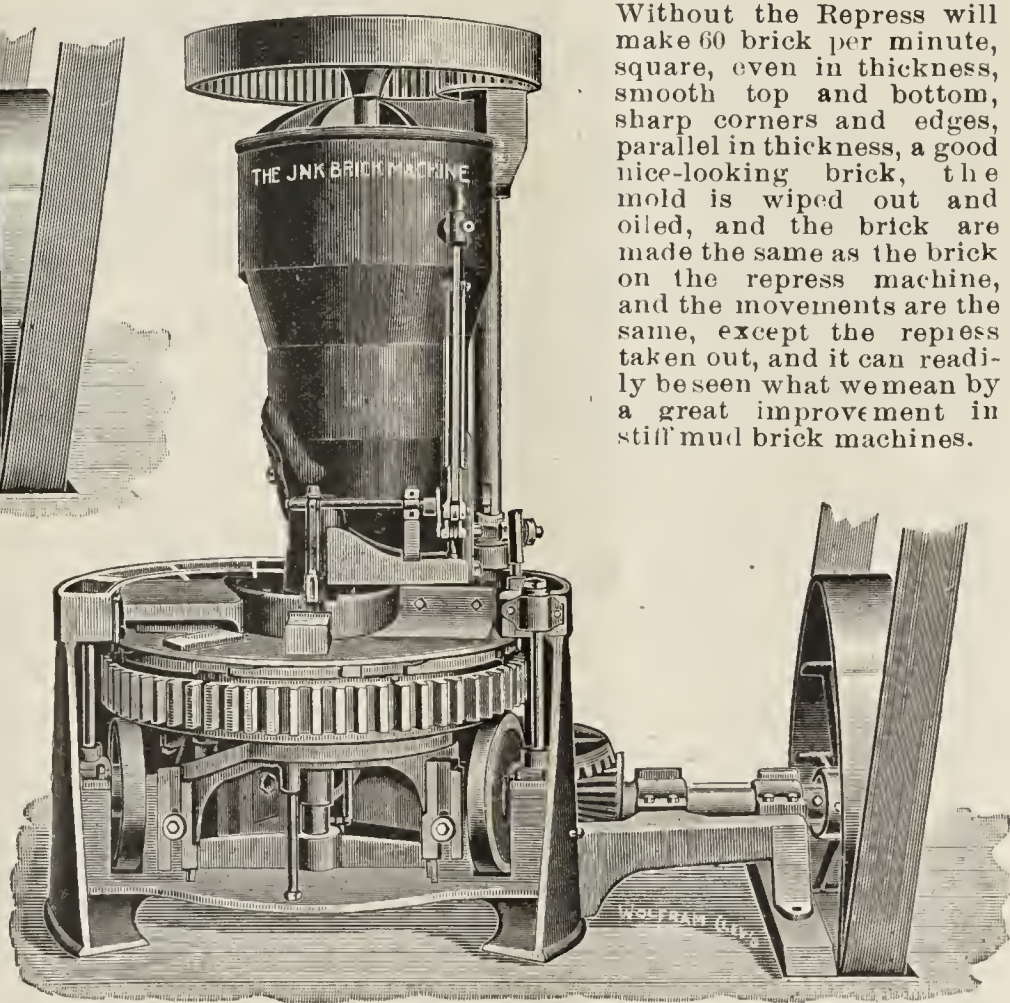


The J. N. K. BRICK MACHINE with
Repress Combined.

As we manufactured the P. L. Sword Machine for about 10 years and have heard of all complaints, and objections to it we started out four years ago, when we bought them out, and began to remove all these though it has taken us four years of hard work and thousands of dollars to accomplish it, the results are the J. N. K. Brick Machine has none of these objections, which were made against the P. L. Sword machine; namely, the press plate and cut-off knives are not used on the J. N. K., as the brick are finished under the cylinder. The molds, when first filled, are filled one half-inch fuller than you want the brick; this surplus half-inch of clay is pressed back, under a heavy pressure into the cylinder, and the pressure is kept on till the brick is finished, so there cannot be any shifting of the clay to one side. The J. N. K. has a thorough system of wiping and oiling the molds. We will further say to those that are using the Sword Machine and are in need of a new mold wheel, or any other repairs we respectfully request a continuance of the liberal consideration, which was at all times shown to us, by those who purchased from us. Any one wishing further information on the J. N. K. Brick Machine or desiring a P. L. Sword Machine or any part thereof, address

THIS MACHINE has eight molds in the mold wheel, and the wheel revolves and brings the mold under the clay cylinder, where the molds are filled, then pressed to an even thickness, then comes the repress and represses them, next the brick is pushed out the molds and onto a belt, then the mold is wiped and oiled and passes on under the clay cylinder again; now you have followed one mold around, and have made eight brick, now you can see as one brick is being made, one is pressed and one is repressed, one pushed out and one pushed off, and one mold wiped and oiled, and the repress is wiped and oiled every time it makes a brick, by these combined movements there is no time lost as 45 brick are made in one minute, and repressed and pushed off, and the molds wiped and oiled in the same minute, as all these movements act at the same time. With this machine fine repressed brick can be made as cheap as common brick.

The J. N. K. Brick Machine



The J. N. K. BRICK MACHINE without Repress.

Without the Repress will make 60 brick per minute, square, even in thickness, smooth top and bottom, sharp corners and edges, parallel in thickness, a good nice-looking brick, the mold is wiped out and oiled, and the brick are made the same as the brick on the repress machine, and the movements are the same, except the repress taken out, and it can readily be seen what we mean by a great improvement in stiff mud brick machines.

The Battenfeld-Morgan Co.,

Successor to CENTRAL MACHINE WORKS,

Send for Catalogue.

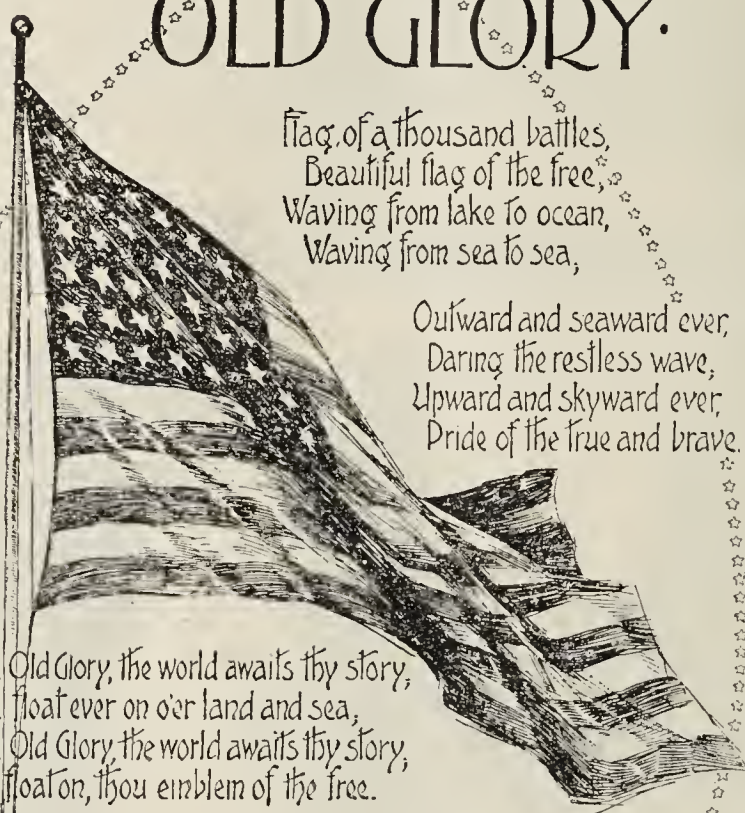
OFFICE AND WORKS: 226-236 Abbey Street, CLEVELAND, OHIO.

Select a Flag.

Here is a Flag for you. Select any one. They all have proud Records. They will win New Glory for you, beside maintaining Old Glory.

-  AUGER BRICK MACHINES.
-  AUGER TILE MACHINES.
-  AUTOMATIC BRICK CUTTER AND SEPARATORS.
-  AUTOMATIC TILE CUTTER AND SEPARATORS.
-  BARROWS.
-  BOARD DELIVERY CARRIAGES FOR HOLLOW WARE.
-  BRICK DIES, ALL KINDS.
-  BRICK RE-PRESSES.
-  BRICK and TILE TRUCKS.
-  BUCYRUS STEAM TUNNEL DRYER.
-  BUFFING MACHINES.
-  COMBINED AUGER MACHINES and PUG MILLS.
-  CLAY DISINTEGRATORS.
-  CLAY GRANULATORS.
-  CLAY STEAMERS.
-  CORRUGATED CRUSHERS and SEPARATORS.
-  CLAY GRINDING MACHINES.
-  DISINTEGRATORS and CRUSHERS COMBINED.
-  DOUBLE WORKING STEAM PRESSES.
-  DRY CARS.
-  DRY PANS.
-  DUMP CARS.
-  ELEVATORS.

OLD GLORY.



Flag of a thousand battles,
Beautiful flag of the free,
Waving from lake to ocean,
Waving from sea to sea,

Outward and seaward ever,
Daring the restless wave,
Upward and skyward ever,
Pride of the true and brave.

Old Glory, Old Glory, the world awaits thy story,
Float on, float ever on o'er land and sea,
Old Glory, Old Glory, the world awaits thy story,
Float on, float on, thou emblem of the free.

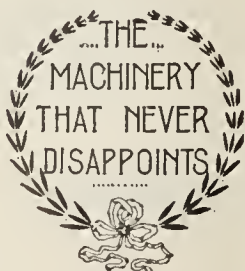
Flag of a thousand battles,
Cresting the billows of fire,
Whelming established evils
Raising the lowly higher;

Challenging ancient error,
Silencing tyranny dumb,
Gladdening and inspiring
Hope for the years to come!

Old Glory, Old Glory, the world awaits thy story,
Float on, float ever on o'er land and sea,
Old Glory, Old Glory, the world awaits thy story,
Float on, float on, thou emblem of the free.

— IRONQUILL.
IN ST. LOUIS GLOBE.

-  ELEVATOR BOOTS.
-  FIRE PROOFING MACHINES.
-  GRANULATING PUG MILLS.
-  HAND POWER BRICK PRESSES.
-  HORSE POWER BRICK MACHINES.
-  IRON WORK FOR KILNS.
-  LUBRICATING BRICK DIES.
-  ORNAMENTAL HOLLOW BLOCK MACHINES.
-  PLATFORM PIPE WAGONS.
-  PLUNGER BRICK MACHINES.
-  PLUNGER TILE MACHINES.
-  POWER TRANSMITTING MACHINERY.
-  PRESS BRICK MACHINES.
-  PUG MILLS.
-  ROOFING TILE MACHINES.
-  REDUCTION MILLS.
-  REVOLVING DUMP TABLES.
-  SEWER PIPE PRESSES.
-  SIZING MACHINES.
-  TERRA COTTA MACHINES.
-  TRANSFER CARS.
-  TURN TABLES.
-  UPRIGHT STOCK, SAND MOLD BRICK MACHINES.
-  WET PANS.
-  WINDING DRUMS.



The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

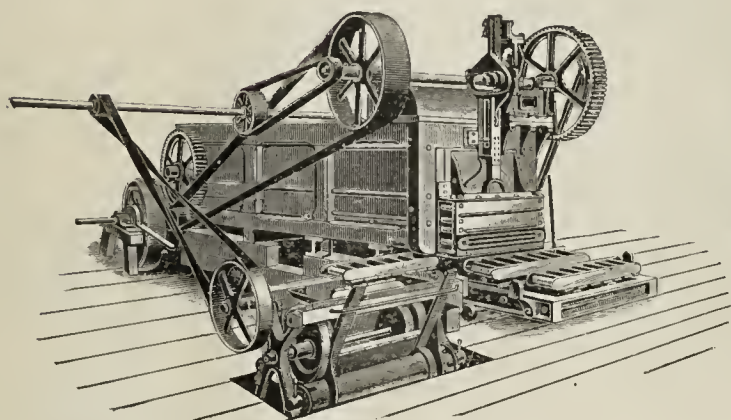
Manufacturers of Dry Press, Stiff Mud and Soft Mud Machines. Write to-day for Particulars.

DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

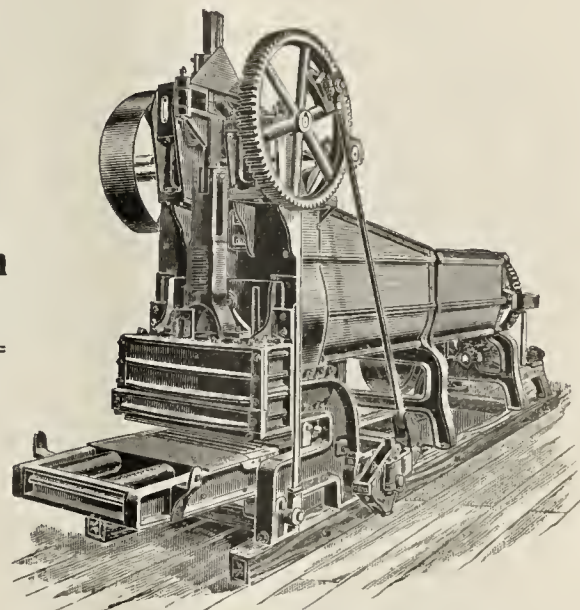
.. THE ..
POTTS Horizontal Stock
 Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

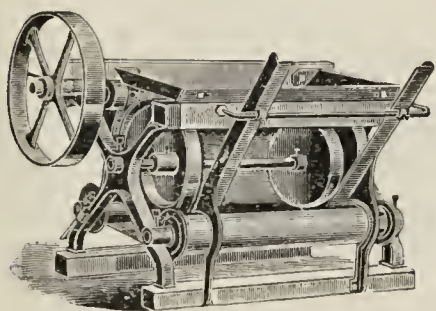
They have no equal
 for making Brick which
 have Clean, Sharp Cor-
 ners and Smooth
 Surfaces.



Iron Frame Pug Mill.

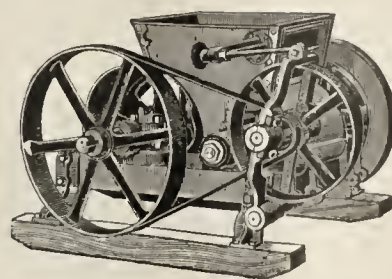
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



Disintegrators,

Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

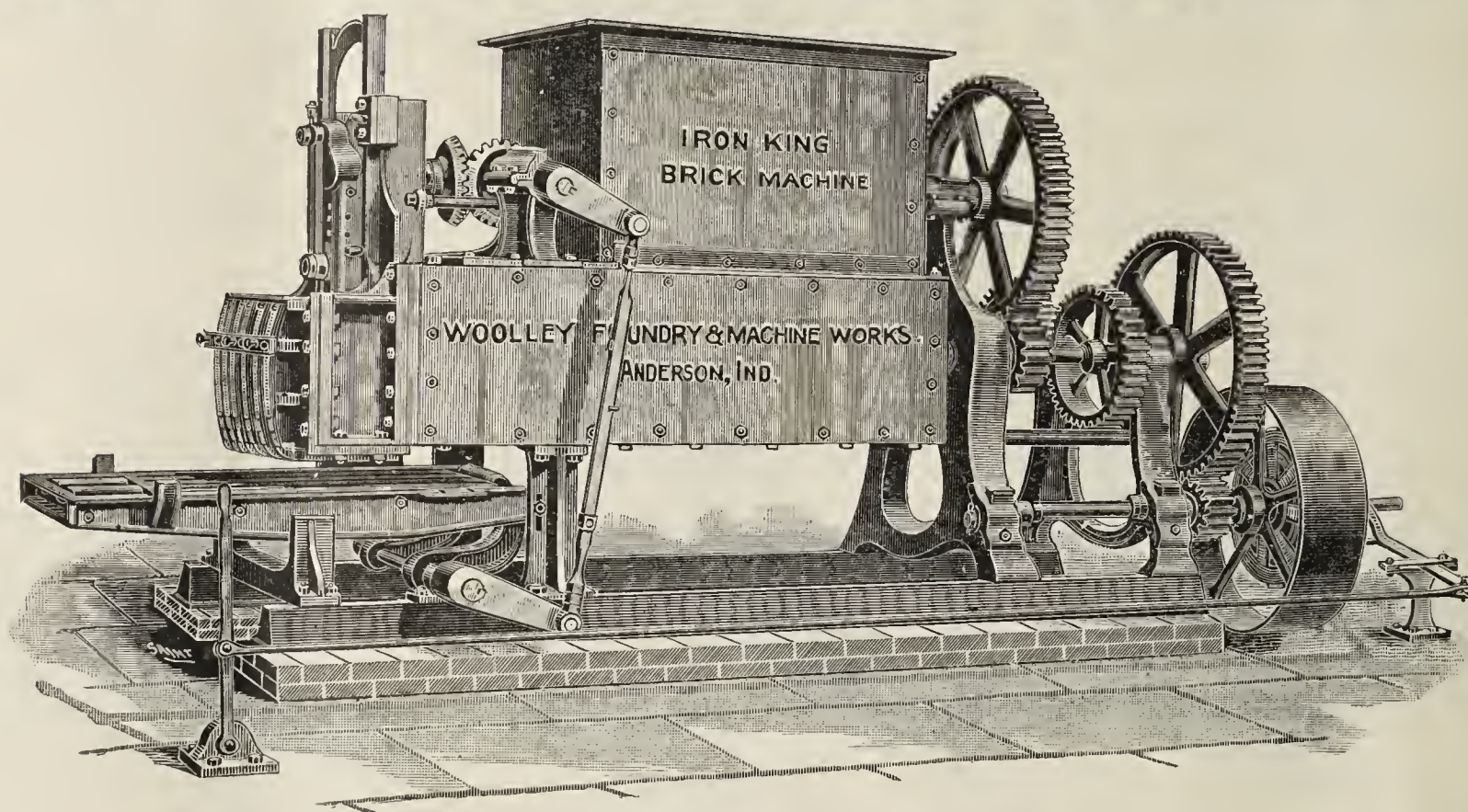
For terms and prices of anything needed on the brickyard write

C. & A. POTTS & CO., 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**

SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “**IRON KING**” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

WOOLLEY DRY PANS,
PUG MILLS,
SLIP PUMPS
and PRESSES

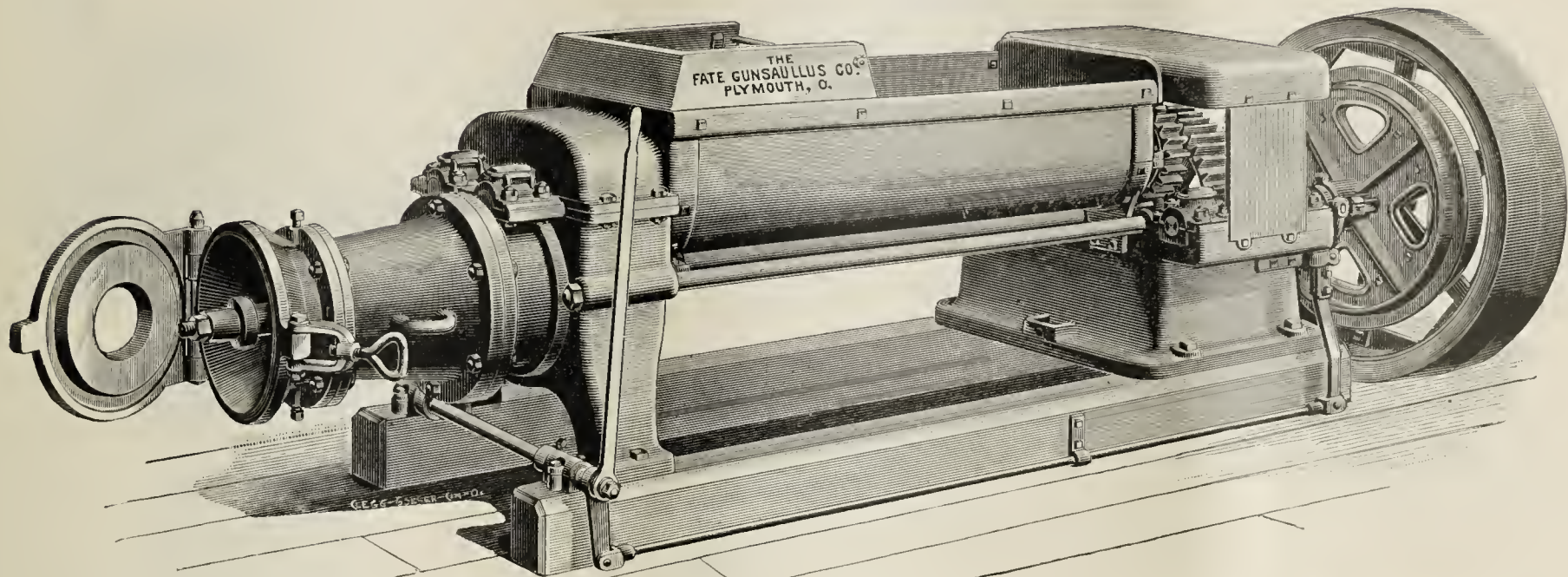
Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

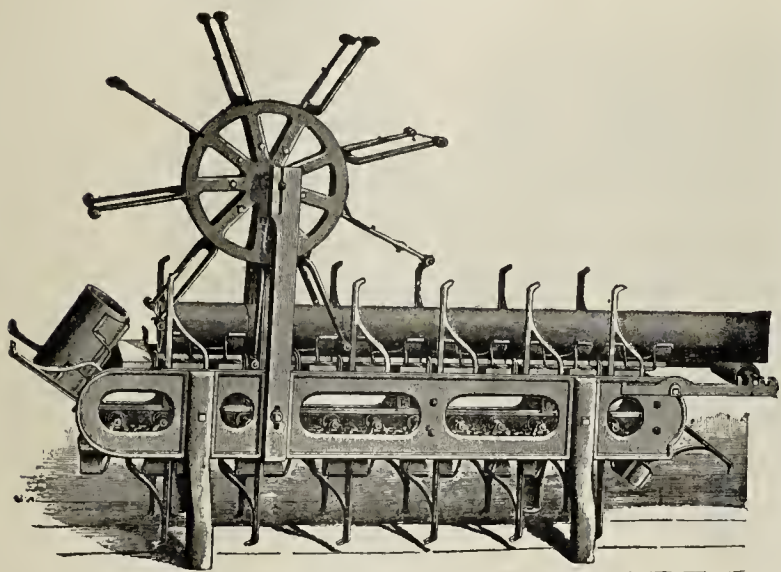
Mention the Clay-Worker.



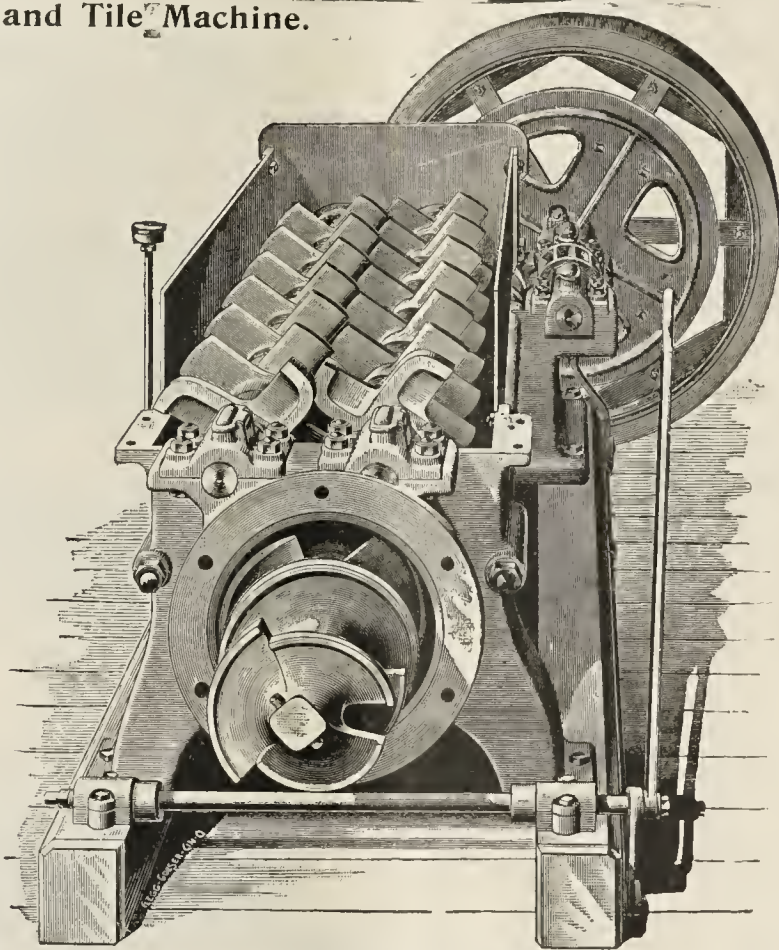
The "PLYMOUTH."



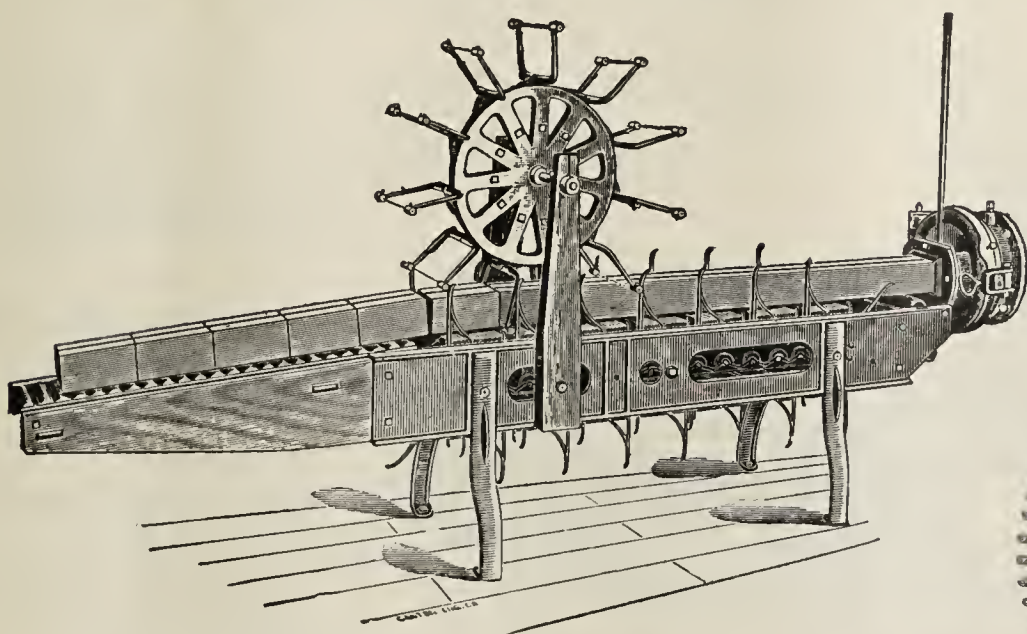
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



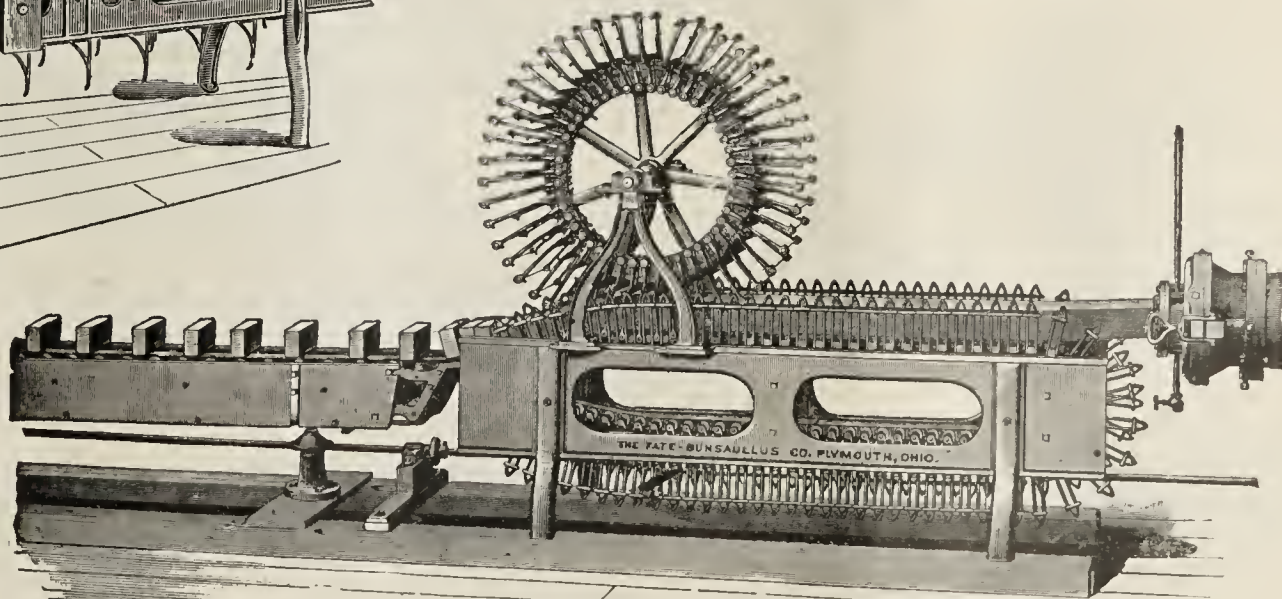
Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



"HUMMER" (Interior View.)



Automatic End-Cut Brick Table.



Automatic Side-Cut Brick Table.

Write for particulars to

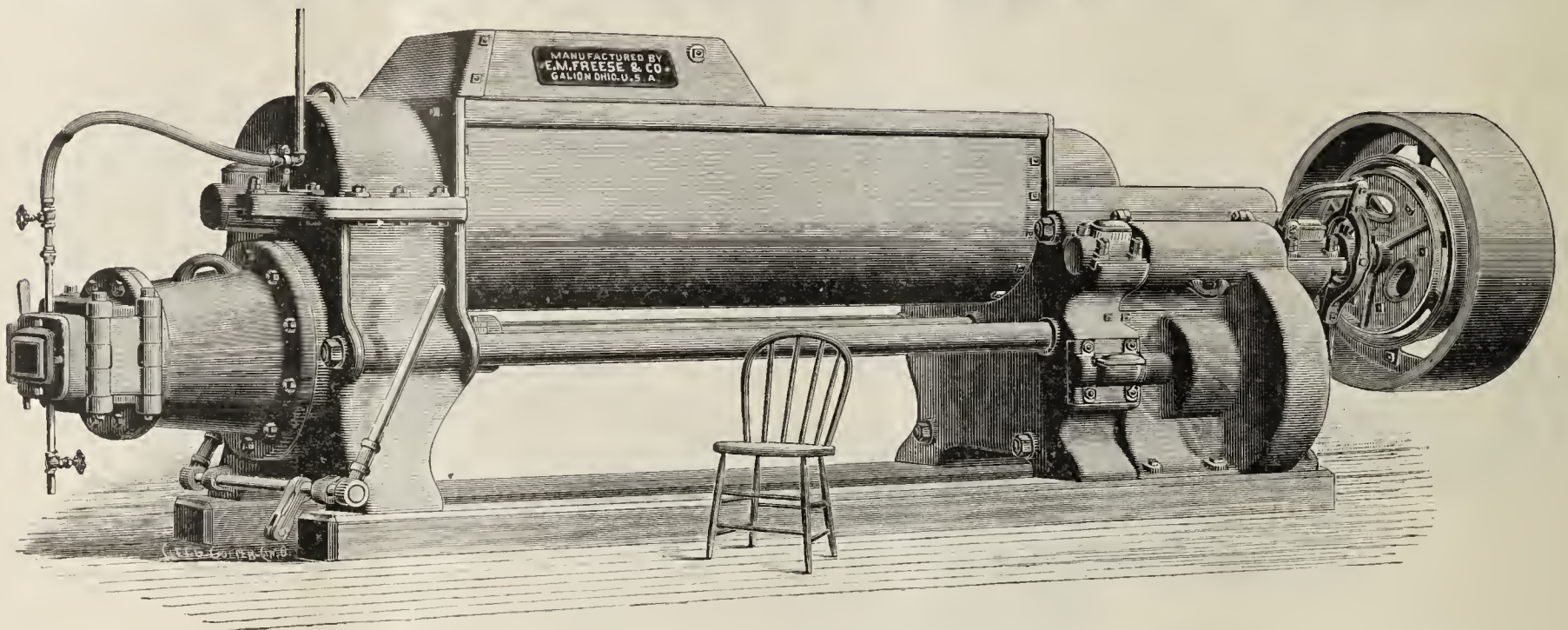
J. D. Fate & Co.,

PLYMOUTH,
Richland County, OHIO.

B. E. LaDow,

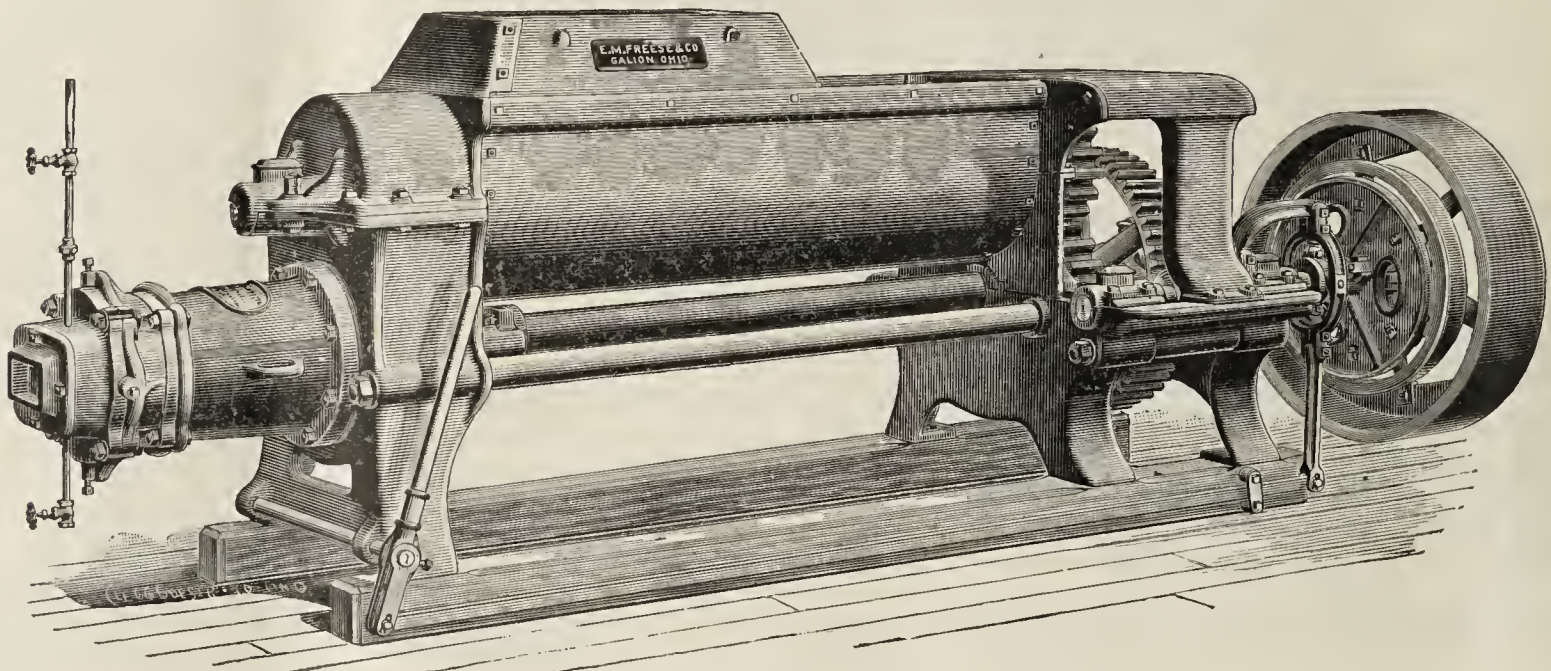
Special Western Representative,
406 Chamber of Commerce Bldg., CHICAGO, ILL.

The Original Union Brick Machines



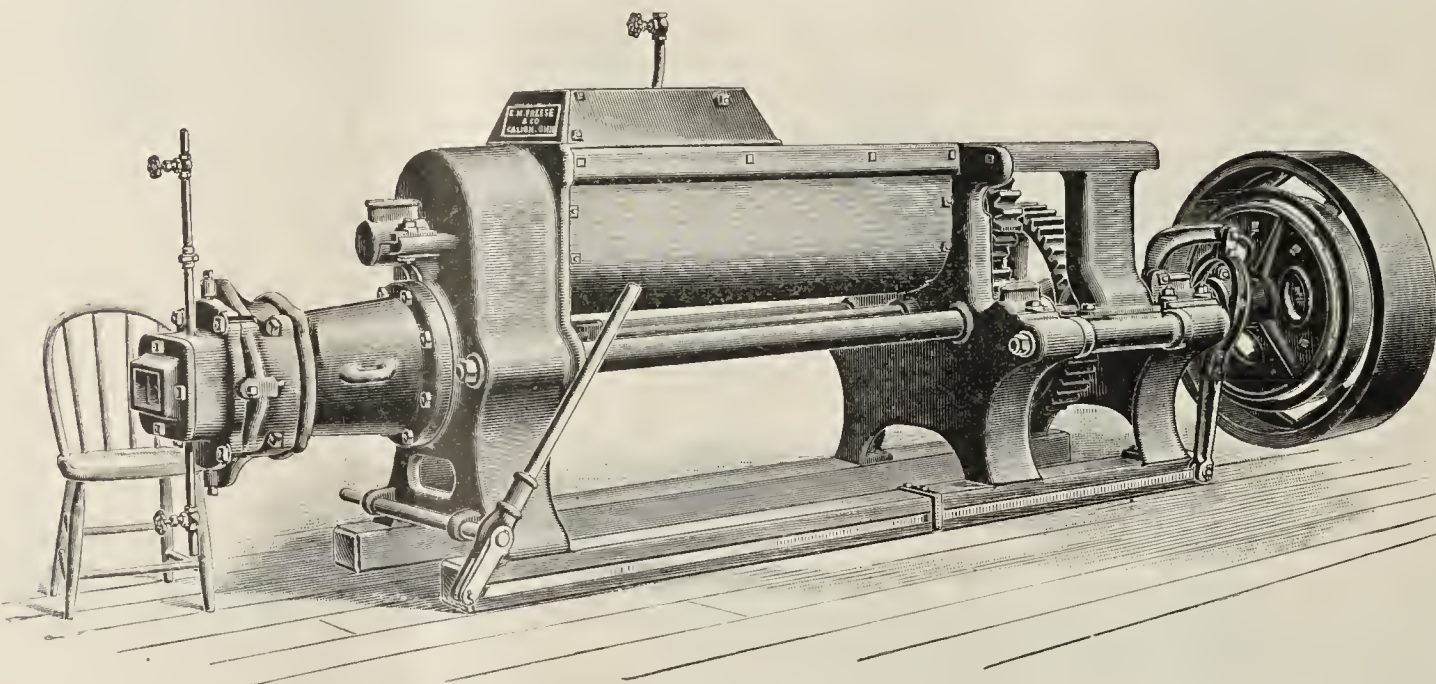
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

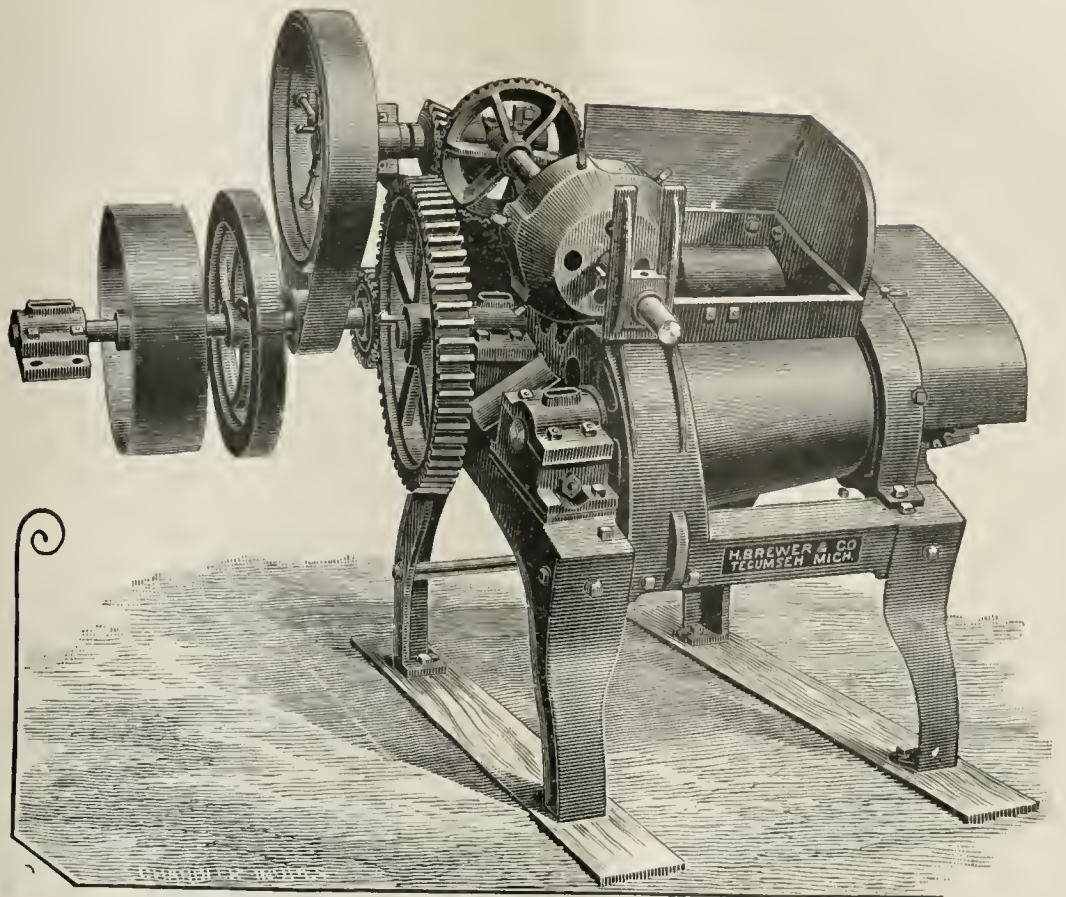
These Machines are
NOT an experiment.

They are used in fif-
teen States.

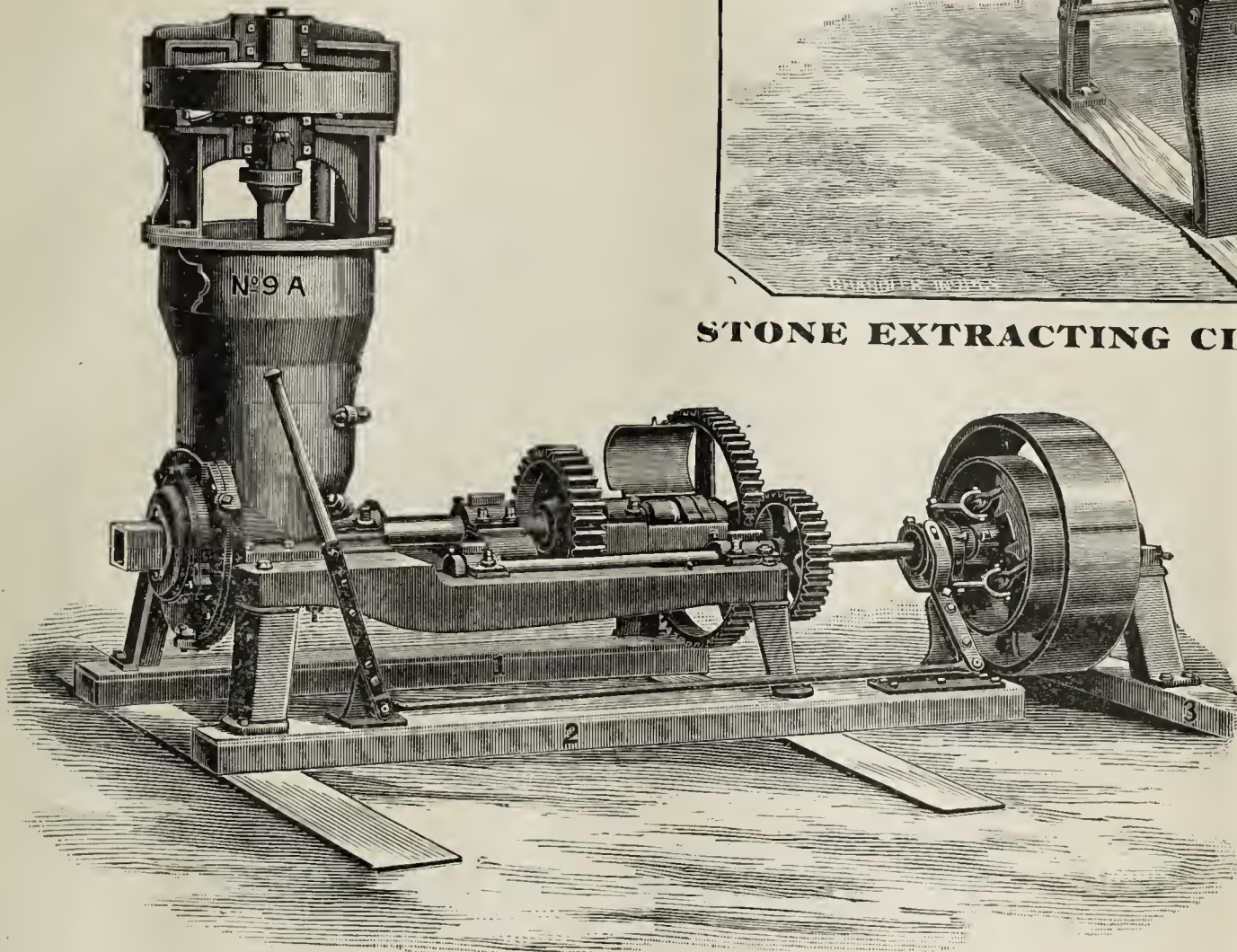
They are a SUCCESS
Investigate them.

No separate Pug Mill
required.

Clay Working Machinery

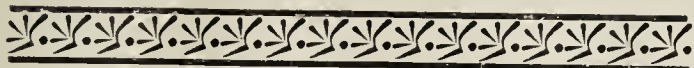


STONE EXTRACTING CLAY CRUSHER.



No. 9 "A" BRICK MACHINE.

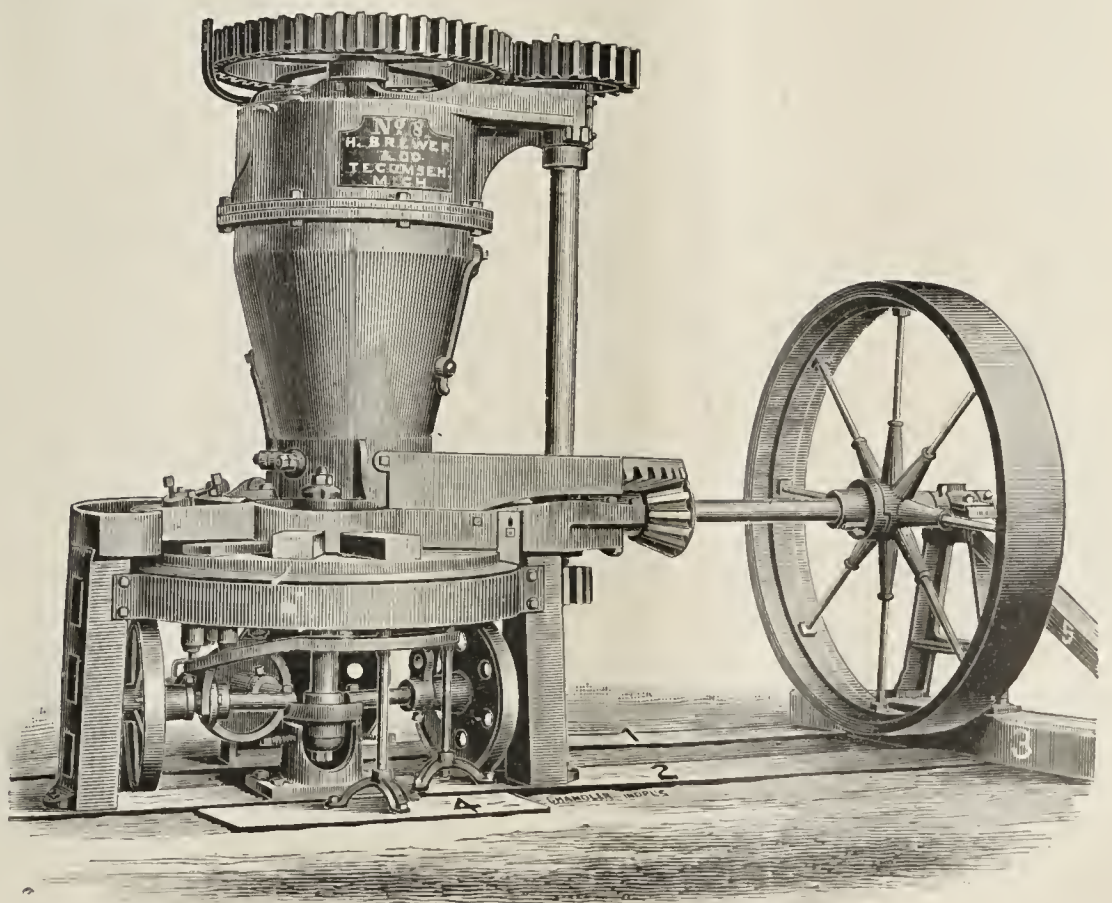
Complete
Brick
and
Tile
Outfits
a Specialty.

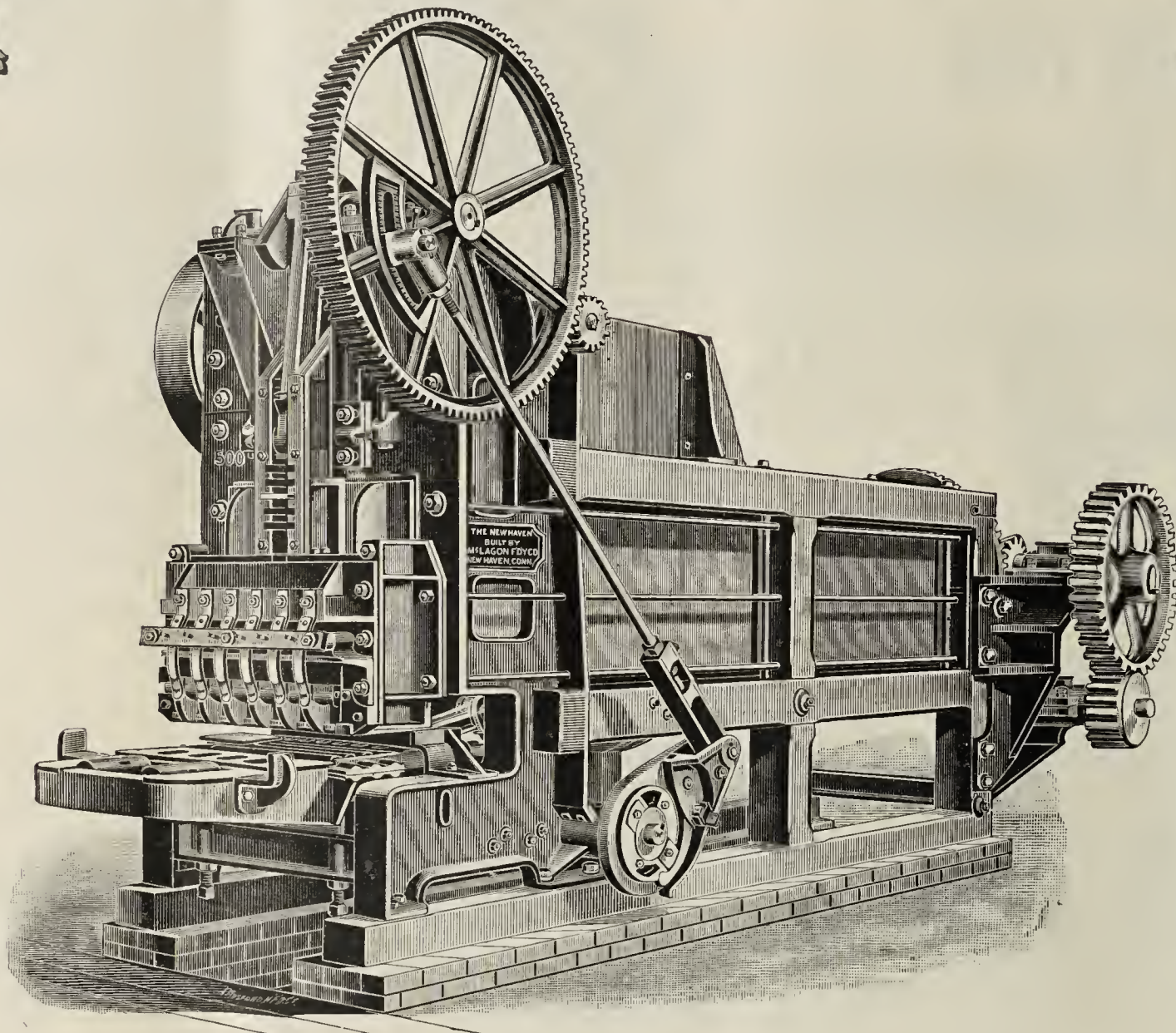


Manufactured by

H. Brewer & Co.,

TECUMSEH,
. . . . MICH.





Value is Proved by Success.

THE FIRST "NEW HAVEN" HORIZONTAL BRICK MACHINE was erected ten years ago, and has been in continuous use seven months in each year since. The average number brick made with it has been **fully one million every month** it has been operated. Notwithstanding this phenomenal production it is good for a like amount of work for many years to come.

Since its advent a large number of these machines have been sold, and all of them have given equally good or better service. **Not one has ever been sold that has failed to give satisfaction.** None have ever been thrown out, or sold second-handed, but all are in successful operation at the present time (excepting one, destroyed by fire). In a number of cases duplicate orders have been received, but **in no instance** has an owner of a "New Haven" Machine placed orders for any other make of soft clay machines. While all this may appear like unseemly boasting, nevertheless it is **an unusual fact**, and shows conclusively its unqualified success.

Continued results determine the economic value of a machine rather than first cost, and on this basis "New Haven" Machines have been proved to be **the least expensive, as well as the greatest profit winners.** That our claims for this are amply substantiated in practice is shown by the testimony of satisfied customers.

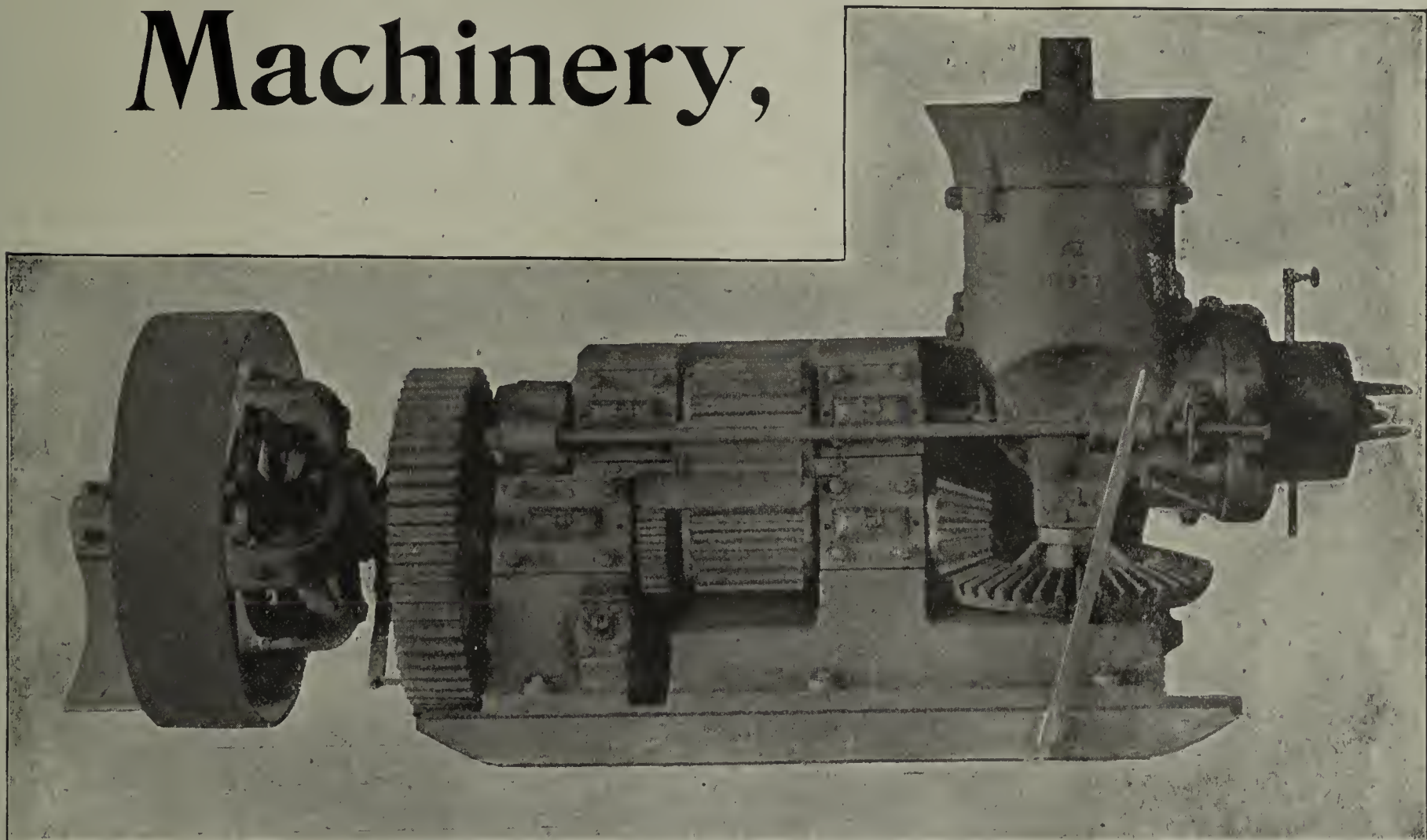
We have a faithful record of every machine from the time it left our works, which has been carefully amended from time to time, and, therefore, know whereof we speak.

The Eastern Machinery Co., NEW HAVEN,
.....CONN.

What's in a Name?

A GREAT DEAL IF A THING BE WELL AND TRULY NAMED AND THIS IS TRUE OF

Wonder Clayworking Machinery,



WHICH is so called because it has proven by actual work in various kinds of clays to have a **Wonderful** capacity, both for quantity and quality. It has a **Wonderful** pugging and tempering capacity and produces a **Wonderfully** strong brick, free from laminations, and in connection with our new automatic cutting table a **Wonderfully** straight, true brick is made of almost any clay. It is this **Wonderful** quality that enables our machinery to work successfully some clays which other auger machines can not work at all satisfactorily. This fact has been demonstrated time and time again. The users of **WONDER MACHINERY** all testify that it is well worthy of the name. They have demonstrated that it has **Wonderful** wearing qualities for which reason it is, in the long run, the best and cheapest machinery on the market.

It will afford us pleasure to send you testimonial letters attesting these facts and quote prices on individual machines or complete plants.

Wallace Manufacturing Co.,

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

Frankfort, Indiana.

Iron Clad Dryer.....IN THE LEAD

All Dry Houses Built in 1898

will be equipped with Important new inventions for reducing cost of drying.

...

**Steam
Heat.
Natural
Draft.**



Guaranteed

To dry soft mud, stiff mud, dry pressed brick and tile, free from white-wash, disintegration or other injury with rapidity and economy.

No fans or other machinery; no skilled labor required to run it.

INFORMATION, ESTIMATES, CATALOGUES Etc., CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

TELEPHONE,
Harrison 296.

CHICAGO, ILL.



DETROIT, MICH.

**The
Best Brick
Dryer
On Earth**

NOTE -

- WE DRY ENOUGH BRICKS ANNUALLY -
- TO BUILD A WALL TEN COURSES -
- HIGH FROM SAN FRANCISCO TO -
- NEW YORK -



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX, No. 4.

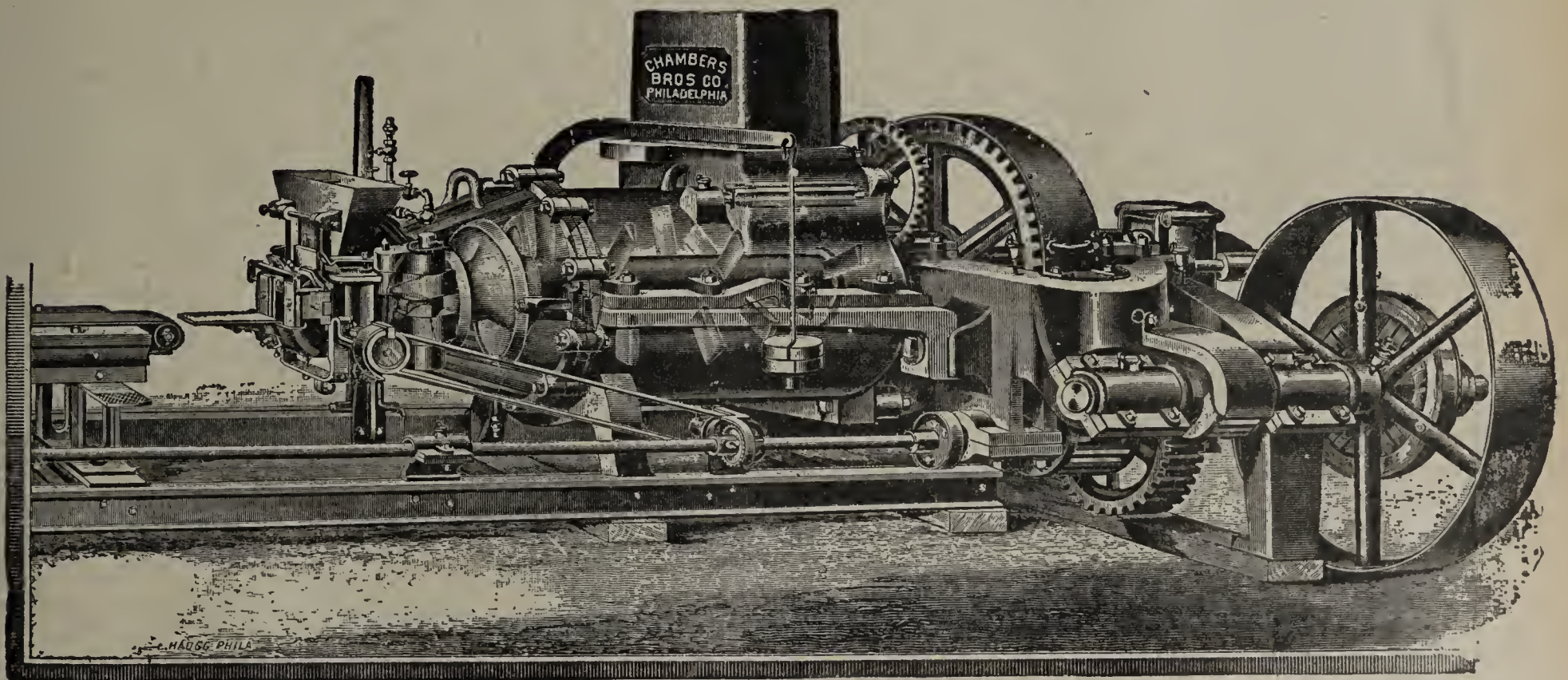
INDIANAPOLIS, IND., OCTOBER, 1898.

\$2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

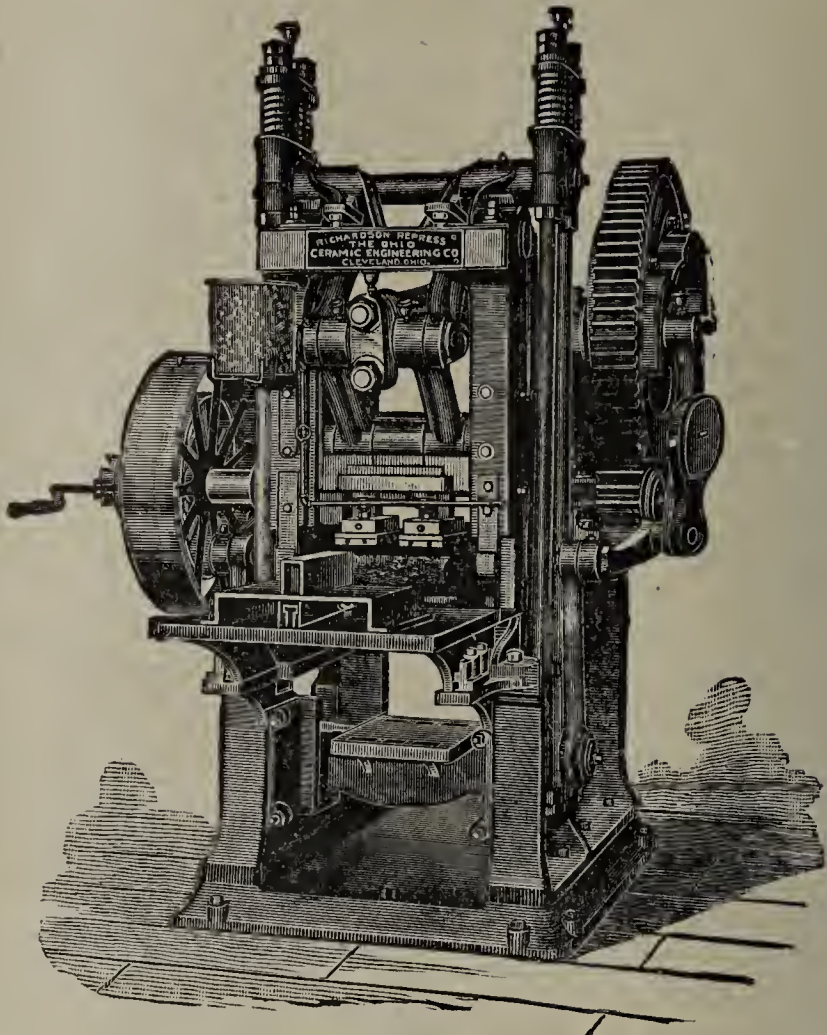
J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

A Brick is
a Brick.

It is either a
good brick, or
good for nothing.

The
RICHARDSON
REPRESS
makes good Brick.



The RICHARDSON REPRESS.

The Ohio Ceramic Engineering Co.
CLEVELAND, OHIO

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
American Clay-Working Mach Co., The.....	328	Progress Press Brick and Machine Co.....	306
Chisholm, Boyd & White Co., The	256	Ross-Keller Brick Machine Co.	259
Fernholtz Brick Press Co., The.	258	Simpson Brick Press Co.....	257

Brick and Tile Machinery.

American Clay-Working Mach Co., The.....	328	Horton Mfg Co, The.....	317
Anderson Foundry and Mach. Works.....	321	Huetteman & Cramer Co, The..	319
Baird and Son, H. C.....	309	Kells & Sons	309
Battenfeld-Morgan Co., The....	330	Leader Mfg. Co, The.....	320
Brewer, H. & Co	333	Madden & Co.....	313
Chambers Brothers Co.....	253, 320	Ohio Ceramic Engineering Co., The.....	254
Chicago Brick Machinery Co...	317	Potts & Co., C. & A.....	327
Eastern Machinery Co, The....	334	Raymond & Co., C. W.....	299
Fate & Co., The J. D.....	331	Steel, J. C., & Son.....	316
Freese, E. M. & Co	332	Taplin, Rice & Co.....	325
Henry Martin Brick Mach. Mfg Co, The	310, 319	Wallace Mfg. Co, The.....	305, 335
Hensley, J. W.....	255	Wellington Machine Co, The...	301
		Wiles Co., A. M. & W. H	316
		Woolley Foundry and Machine Works	329

Brick Kilns and Dryers.

Alsip, S. H	315	Morrison & Co., R. B	323
American Blower Co, The.....	336	Martin Dryer Co.....	307
Barron, A. F.....	336	Phillips, S. G.....	307
Carson, J. W.....	308	Pike, E. M.....	307
Eudaly, W. A	323	Reppell, L. H	315
Fernholtz Brick Press Co, The.	258	Standard Dry Kiln Co, The....	260
Haigh, H.....	322	Swift, F. E.....	326
Lehmann & Co, F.....	322	Yates, Alfred.....	314

Brick Yard Supplies.

Arnold, D. J. C.....	318	Horton Mfg. Co, The.....	317
Atlas Bolt & Screw Co, The....	314	Jeffrey Manufacturing Co, The.	313
Carlin's Sons, Thomas	314	Marion Steam Shovel Co.....	318
Caldwell & Son Co., H. W.....	311	Mershon & Co., W. B	308
Carmichael, T. W.....	309	Mey, F. H. C.....	314
Carnell, Geo.....	315	Newton, A. H.....	313
Coldewe & Co., G.....	308	Phillips & McLaren	312
Elder & Dunlap.....	310	Pittsburg Mineral Screen Company, The	310
Frost Engine Co	324	Stedman's Machine Works....	316
Harrington & King Perforating Co, The.....	255	Williams Patent Crusher and Pulverizer Co	309
Henry Martin Brick Machine Mfg. Co, The.....	310, 319		

Miscellaneous.

Associated Trade & Industrial Press	311	Indianapolis Engraving and Electro Co.....	313, 314
Bennett & Sayer.....	310	Indiana, Decatur & Western ...	312
Big Four R. R.....	311	Illinois Central R. R	314
Cincinnati, Hamilton & Dayton R. R.....	312	Lake Erie & Western.....	313
Chesapeake & Ohio R. R.....	313	Manly, F. B.....	308
Clinton Paving and Building Brick Co, The.....	302	Main Belting Co	311
Coaldale Brick and Tile Co., The	302	McAvoy Vitrified Brick Co	303
Cotton Belt Route.....	313	Monon Route	312
Des Moines Brick Manufactur- ing Co, The.....	302	Osborne, W. R.....	309
Dean Bros. Steam Pump Works	312	Purinton Paving Brick Co, The	303
Dover Fire Brick Co.....	311	Rockwood Mfg. Co, The.....	312
Evens & Howard	307	Rochester Optical Co.....	309
Gabriel & Schall.....	310	St. Louis Terra Cotta Co.....	310
Geysbeek, S.....	312	Tennille, A. F.....	310
Hay & Willits Mfg. Co	321	Vandalia Line	311
Indiana Bermudez Asphalt Co.	302	VanDuzen Co, The E. W.....	312
		Wabash Railroad.....	311
		Small Ads., Wanted, For Sale, etc.	

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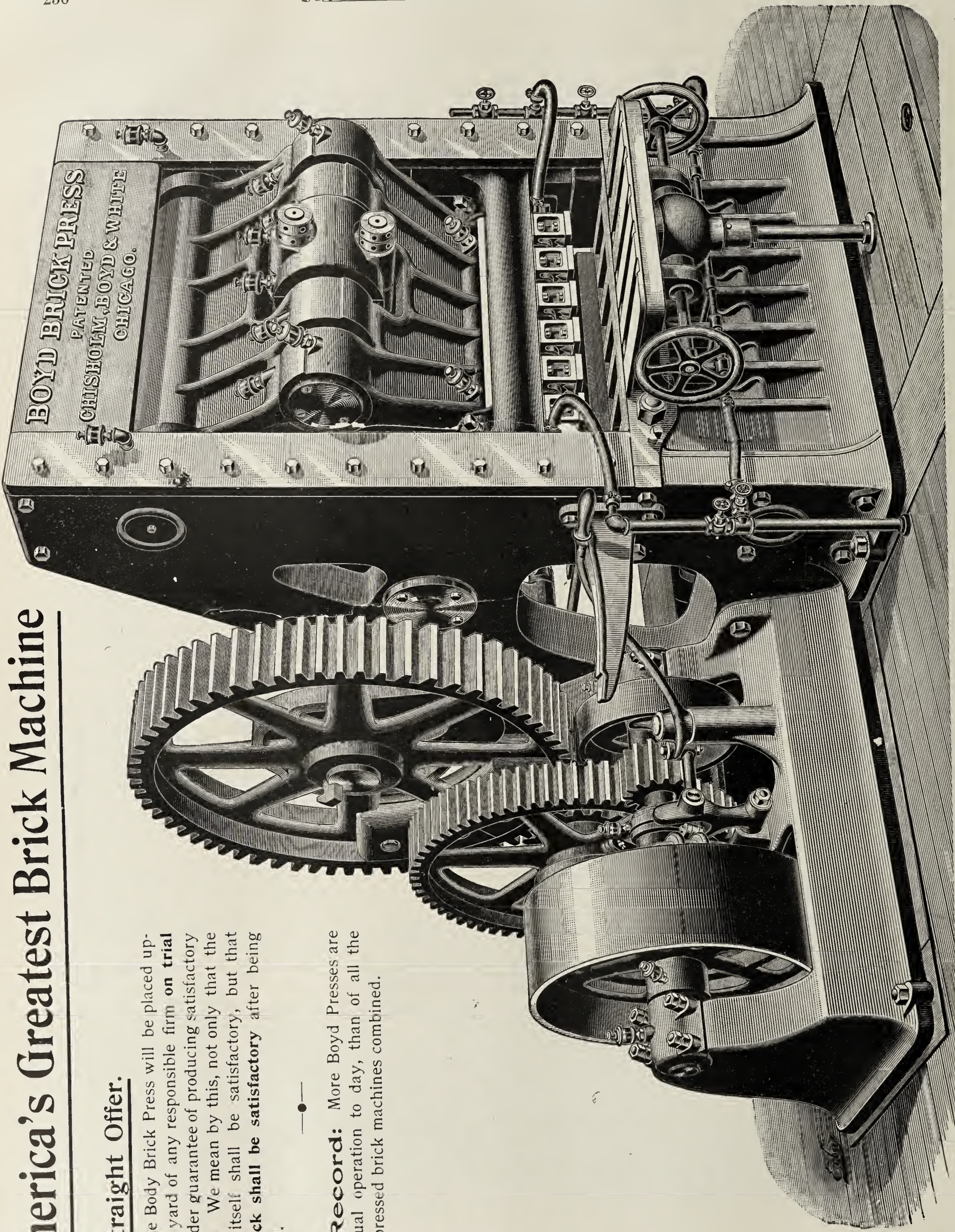
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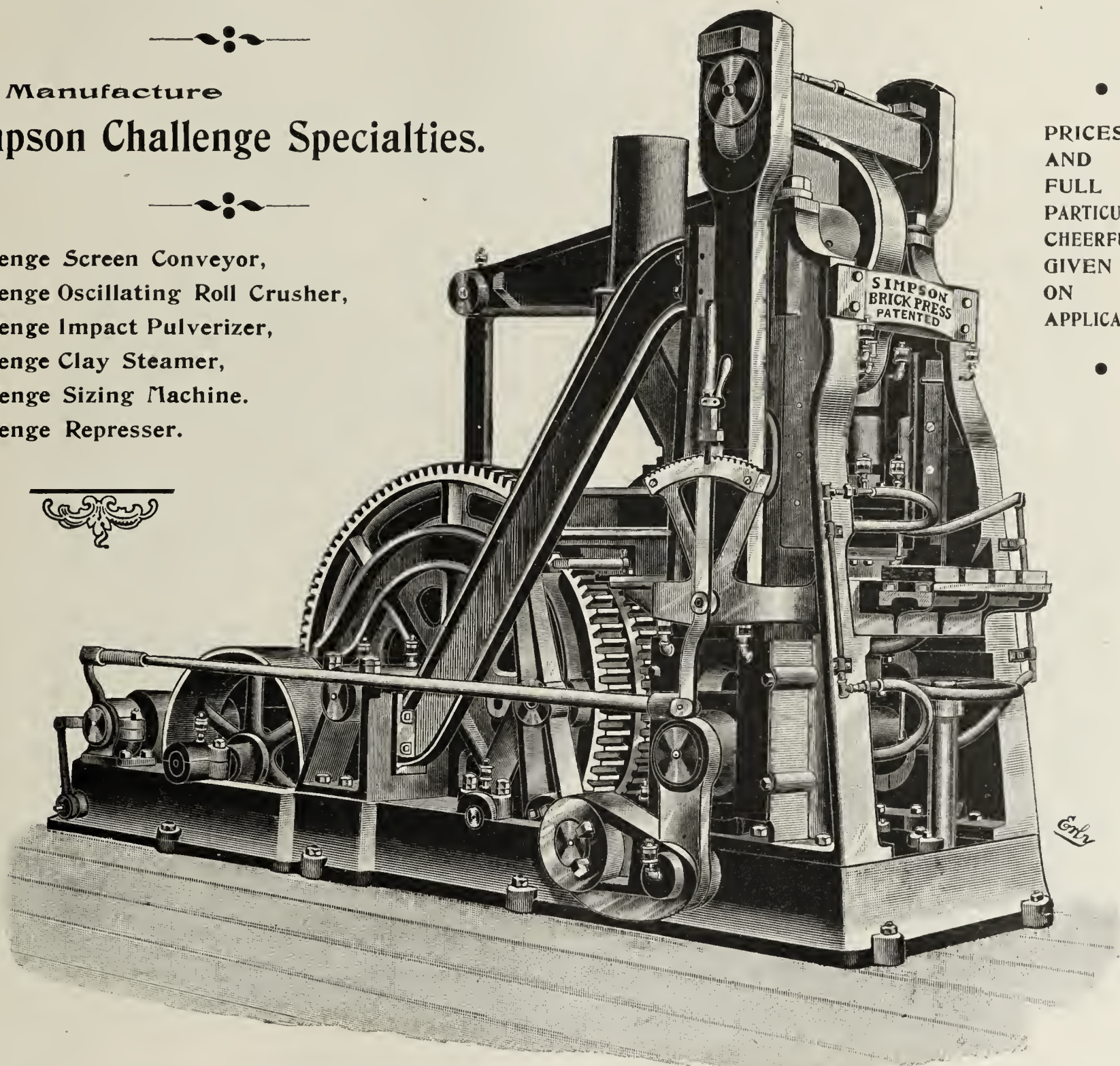
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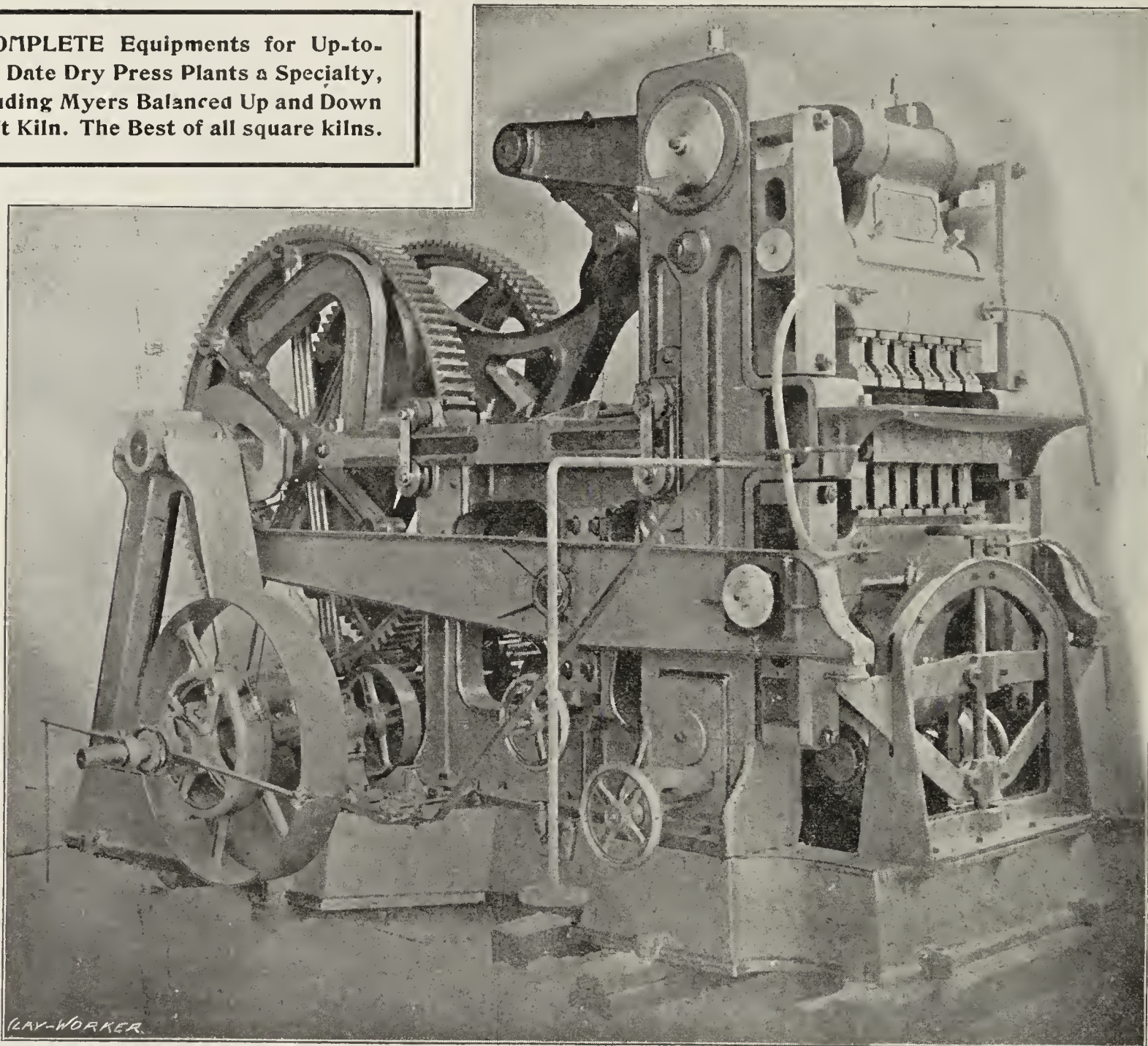
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The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

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The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

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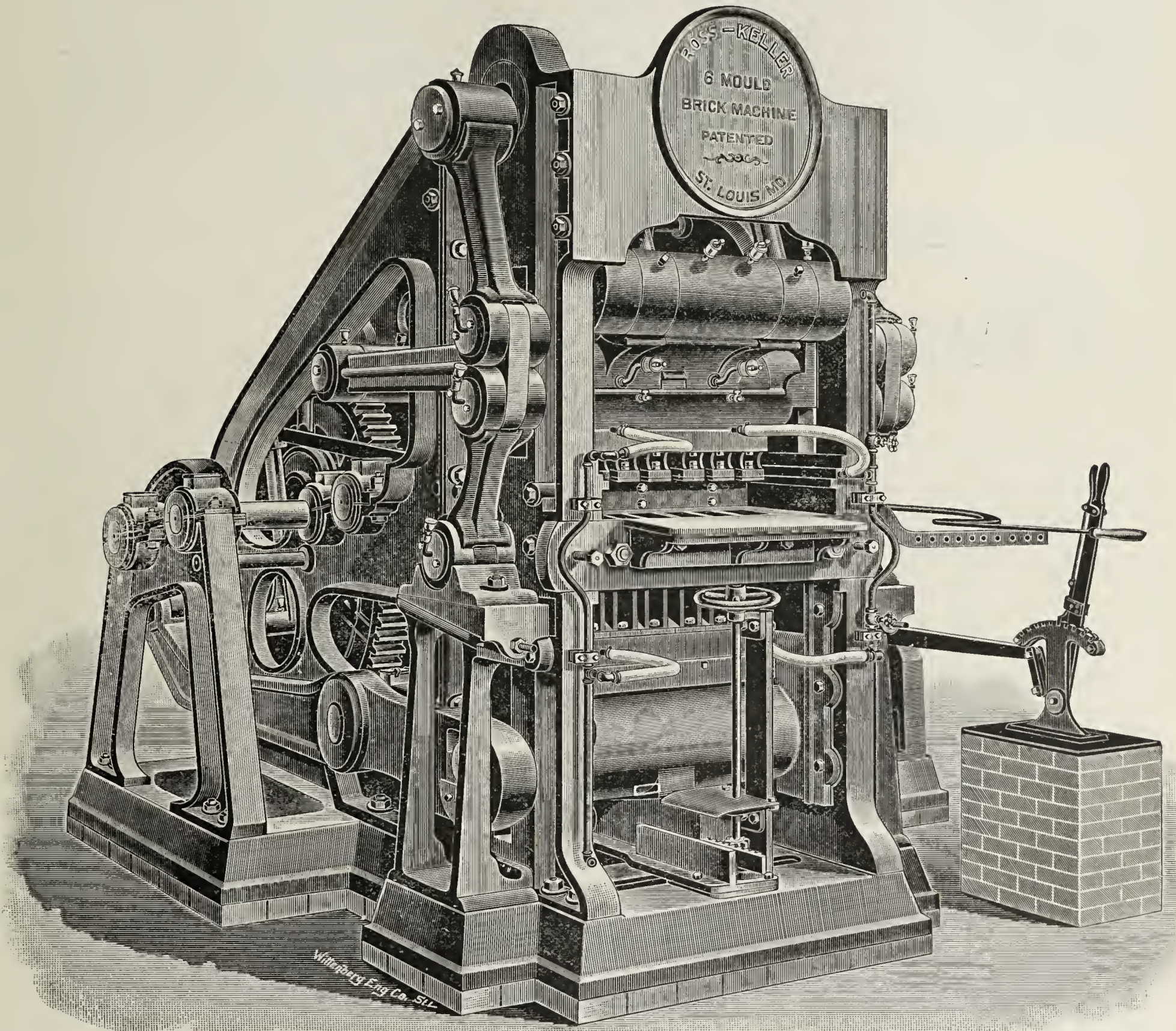
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The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

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The Standard

WILL DRY THE EARTH.

Not all in one chunk, perhaps, but taken in sections, in the form of brick, or tile, it will dry a greater percentage of it and do it **better, quicker** and **cheaper**, than any other artificial drying system on the market.

This is a very broad claim, but we believe the record of **The Standard Drier**, as made up by users, warrants us in making this assertion.

There may be—there probably are, other good Driers, but that

The STANDARD IMPROVED

BRICK AND TILE DRIER

Is a good Drier, is proven by the testimony of its many users. If you are interested in the subject, let us send you some letters from people who are using it. They will give you a pretty good idea of how it is working on different kinds of clay, in different parts of the country. That's the best way to determine the quality of an article—find out what those who are using it, think of it.

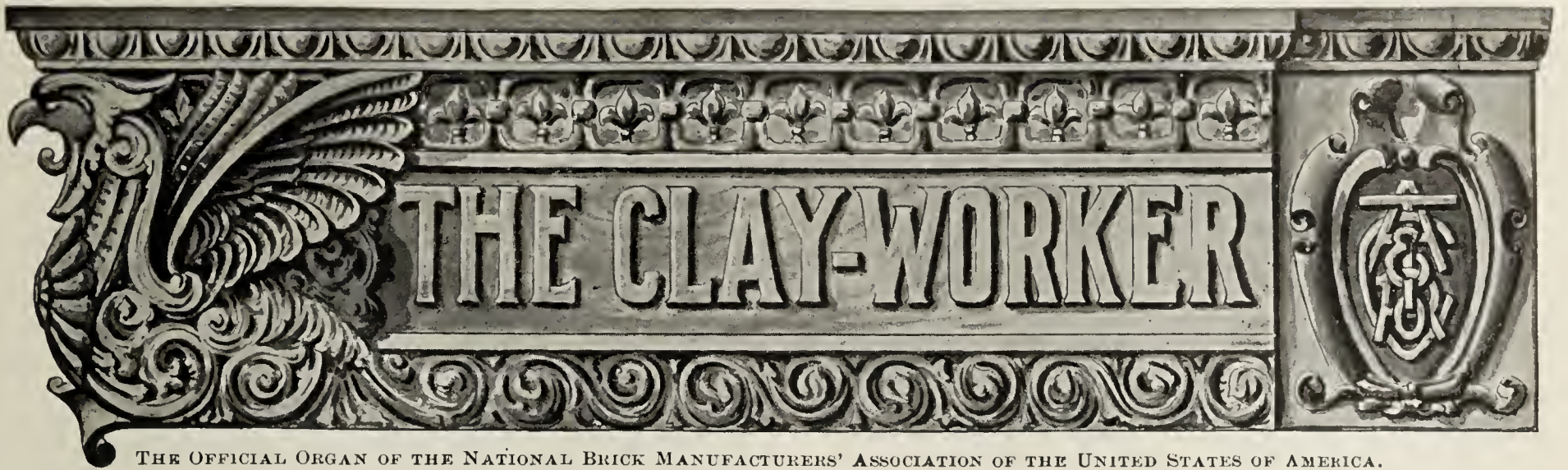
There are some things that a Drier is not supposed to do, but it should dry clay products, and do it right. This is what the "**Standard Drier**" does, and what it does, it **does right**. You take no chances in buying "**The Standard**." We tell you beforehand what it will do with the kind of clay you are using, and guarantee it—making payment for the Drier contingent upon its ability to do what we say it will do. Isn't that fair? What more could you ask?

Send for catalog, illustrating and describing our system, also book of testimonials.

The Standard Dry Kiln Co.,

186 South Meridian Street.

INDIANAPOLIS, IND.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX.

INDIANAPOLIS, IND., OCTOBER, 1898.

No. 4.

Written for the CLAY-WORKER.

TERRA COTTA FRONTS.

IN CLOSE PROXIMITY to Garfield Park, in the most beautiful part of West Adams Street, Chicago, stands the house of which I write. It was built according to the most carefully prepared plans by Jenney & Mundie, also Handy and Cady, Architects. The entire front excepting the steps is of terra cotta, furnished by the American Terra Cotta Company. The details are most carefully worked out; and the creation is a thing of beauty. It is, I believe, the only house built of terra cotta in the city. Mr. Gates of the American Terra Cotta Co. has one, which he built for himself, at Hinsdale. An illustration of Mr. Gates' house was given in a former number of the Clay-Worker. This is the home of Mr. Nathan Herzog, treasurer of the American Terra Cotta Co. The color of the terra cotta is a warm true buff. The Mansard roof is of red tile, made by the Celedan Roofing Tile Co. The effect is harmonious and effective. The illustrations show distinctly the leading details of the work; but the shadows cast by the beautiful porch hides the exquisite details

of ornamentation about the door and windows. This house is one of the best examples of the use of the best product of the workers in clay of the last decade.

Ten years ago all Chicago fronts were built of either brick or stone, and of the former the color was almost entirely confined to red, being now and then varied by the use of the Milwaukee Cream brick, which in comparison with the many light colors now to be had is not at all desirable. New and pleasing colors are continually being added to the already long list. I can only name a few of them—the most striking, perhaps, are the rain washed brick, old gold and mahogany. Then there are green brick, for country residences. Nothing could be more effective than a

house built of green brick with a pointed gable roof of red tile. Then there are cream white brick for Frenchy cottages, for country Summer homes, unfit for city use on account of the smoke and dust but I must not take space here to tell you of all the kinds, and their possibilities. It would make a chapter by itself, suffice it to say, that those who wish to build can find artistic brick that has never been used for houses in Chicago or its vicinity. This is equally true of terra cotta, either glazed or plain.

About ten years ago the



A TERRA COTTA PORCH.

Rand & McNally building on Adams Street was erected in Chicago, it being the first building in Chicago, and, I think, in the country to have a front exclusively of terra cotta. Since then among the most prominent is the New Stock Exchange, Reliance Building, Schiller Theater and the Journal Building. The Reliance building is of white glazed and the Journal building of varied colors and glazed terra cotta.

Architects and builders have no cause for complaint of the lack of artistic material ready for their use, and there is a steady improvement, each worker in clay is constantly striving to invent something new, and attractive in this line, but he needs encouragement from architects and buyers. While nothing can be said to detract from the beauty, stability and grace of work in stone, all who work in clay feel that the artistic possibilities of brick and terra cotta are only beginning to be realized. It must remain for some original mind to fully appreciate it, and build of it, artistic unique houses in the city and country. Some of the possibilities may have been suggested in this article.

TEMPERED CLAY.

Written for the CLAY-WORKER.

BUTTON HOLE TALKS.



I HAD JUST DRAWN my head in from the window of the car, out of which I had stuck it to take a look at a brickyard we were passing, just as we all do, and always will do. Whatever we may miss in our travels, it will not be brick or brickyards. As I was tucking my distended neck back into my collar, hunching up my knees and getting ready to again sit down on my back in that peculiarly graceful posture so often assumed on the cars, I felt some one slide in beside me, and looking down at my button-hole, as I always do first thing now when there is any disturbance, I found a man attached.

"I had my eye on you all along," said he, "and was pretty sure of you, though I couldn't see any sand in your hair, but I waited till you 'rubber necked' at that old brickyard, and then I knew I had you. Thought I couldn't be mistaken in that nose, those hands and feet and that frayed button-hole, but the brickyard settled it all right.

"I once ran that brickyard we just passed, and I spent some happy and contented years there, too. Funny, isn't it, how a man lives sometimes in a little circumscribed scene, bounded by a very, very narrow horizon, living a small life, may be, and with narrow ideas, yet free from much of the soil and stain that are so common and almost unavoidable in your wide-horizon city-life? In that little place I remember that the sky always seemed higher right over my head and the earth firmer beneath my feet. No, heaven wasn't exactly further and hell nearer, but everything was intensely personal, and I was feeding on myself, as it were.

"I wondered how the world could be round, when my world was a dish, with myself at the center, and my horizon the rim. I wondered how it was that in my dreams all the bears were after me, why they never chased anybody else, why all the hobgoblins were my hobgoblins, why I was always the one who slid off the steep roof and hung clutching the fragile gutter with one hand. This personality attached not only to my dreams, but to my life. I had to see to every little mean detail of digging and delving, and every moment was fraught with detailed annoyance and worry.

"Broadening the horizon hasn't exactly brought me nearer heaven, though, and may have shortened the distance to the other place. The city gets closer to that place and further from the zenith of your country place, sure. You soil your linen and your soul quicker there than in the country. You can, of course, keep up appearances by having your linen laundered, but you cannot wash out the stain on the other so easily."

"Broadening the horizon, though, broadens a man's view be-

yond question. He runs against things that would be unsuspected and unseen in the little place. Chances to do and to not do, and the doing of some of these and the not doing of others, makes him a man among men, strong and reliant and stronger and better than he could ever become in his old environment. But, if he reverses this and goes bad, he becomes infinitely worse in the city than he could in the country. Do you imagine a nun shut up all her life in a nunnery has more character than the handsome typewriter, living in the city's whirl and temptation, but overcoming and conquering them?

"This theory is all right, if everything goes right, but I have widened my horizon until heaven is no longer over my head. I have been a rolling stone, and my crop of moss is nil. The other day I looked in on my successor in that little yard, and he is living as I lived and dreaming as I dreamed, and I fear



Mr. Herzog's Terra Cotta Residence, Chicago.

that widening my horizon has not made me happier or cleaner, when I see him so content and happy.

"Someway, seeing him, so content and happy, makes me long again for green fields and running brooks, for cloud-flecked valleys and daisies and dandelions, for quiet rest in the shade to the musical tinkle of the happy bobolink's trill, while I try to banish the meanness and dirt of the artificial, man-made city.

"No, my horizon is broadened, but my linen and my conscience are not so clean."

GATES.

As a rule, the man who places his advertising with the greatest judgment is the man who confines it to a comparatively small list of publications and who uses large space in those publications.—Printers' Ink.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK—Thirteenth Paper.

—Buff and Flashed Brick—



URFACE WEATHERING is also strikingly shown by many No. 2 fire clays. Along the surface the iron pyrites, which are to be found in most of these clays, are oxidized to iron sulphate, and subsequently to ferric oxide. As a result the iron instead of appearing in the form of grains is uniformly disseminated and a buff color is produced in the burning. But as soon as the zone of weathering has been penetrated the clay will show the original concretionary iron and



A Terra Cotta Mantel in Mr. Herzog's Residence.

the brick will be of a whiter body showing the black particles of iron at a comparatively low temperature. The lesson to be drawn from this is a very simple and practical one. If clean buff brick are wanted the weathered material is to be used, if flashed ware is desired the unaltered clay must be worked. This fact should influence all who are investigating land for the purpose of manufacturing pressed brick.

For buff brick alone, the area of clay land should be large so that the weathered clay can be used; for mottled and flashed brick the unweathered portion, which usually represents larger masses, is worked and size of the land is not of such importance. Of course, this must not be accepted as a general rule since the contents of concretionary iron and the chemical and physical composition of the clay itself must determine whether a material produces good buff or flashed brick.

A clay may contain so little of the iron sulphide that the color is not influenced to any great extent if the brick are burned to ordinary pressed brick hardness and again a clay quite high in such iron may not show the specks owing to a comparatively large percentage of fluxes, alkalies and lime, the latter causing the ware to burn hard before the iron particles "boil" out. But the fact remains that the cleanest buff color is obtained from clay in which the iron exists in the ferric form, and that for flashed brick the clay must be unweathered, that is, a portion of the iron must be present in grains usually as sulphide. However, it is quite common to find works which use one unweathered clay, burning it at a lower temperature for buff and at a higher for flashed brick. But as a rule the buff suffers by this practice, that is, the color is not a clear one.

No definite rules, covering any and all clays, can be given and hence individual examination and testing is the more important. A clay should be known in all its aspects.

There is yet another example of weathering or surface action which the writer wishes to cite. It is a combined oxidizing and leaching process. Perhaps it is best to use another illustration of a practical case. Let us suppose a sloped deposit of clay containing pyrites, which in some way is exposed to the influence of air and water. The iron sulphide is oxidized into a sulphate by the air, and, being soluble in water, it is carried down the slope and is finally left over another deposit of clay which contains more or less lime. Now, a change takes place. The sulphuric acid of the sulphate of iron transfers its affections to the lime of the clay, forming sulphate of lime. As a result we have an ideal combination for producing white washed brick. Various other instances might be cited showing the difference between weathered and unaltered clays.

—One Case of White Wash.—

Speaking of lime sulphate in clays it is quite remarkable that so little attention is paid to this very important subject. Clay beds are opened and manufacturing is begun without the least attention being paid to the presence of salts which may give rise to efflorescence. Several flagrant examples of this kind come to the writer's mind. A yard in Northern Ohio, making common brick, was using a clay taken from the bottom of a hill, the material being very nice to work. But the great trouble was white wash. Every brick soon after being taken from the kiln white washed in the worst possible manner. Although everything was tried, all the white wash cures were given a fair chance the brick continued to be afflicted in the same way. By the way, one man seriously proposed that the brick be given a dip of common soda after burning. The advice was duly tried and the result was a double coat of white. Even stale beer was powerless to do away with the white wash. Now, the men in charge of that plant never studied the situation carefully or with the help of a little theory. But the fact of the matter was this. The hill at the foot of which the clay bank was located contained originally clay throughout which sulphur compounds were uniformly disseminated. In the course of time, through the action of water a good deal of these sulphur salts was carried down to the foot of the hill and concentrated there. As a matter of course brick made from a clay containing sulphates in such large quantities were bound to effloresce. The clay from the upper portions of the hill was comparatively free from the obnoxious salts, but was not as nice to work. Finally the discovery was made that brick made from the upper clay did not white wash to any injurious extent and the bank was transferred towards the top of the hill. But at this stage the financial standing of the concern was very much weakened (not alone due to "whitewash," but also to such factors as new-fangled kilns and incompetent management), and the result was that finally the whole thing collapsed.

The brick made at this yard, though now laid up in buildings

for a number of years, are still addicted to the whitewash habit.

—Another Example.—

Of the indifference which is shown by brickmakers on this subject has come to the writer's notice in another Ohio town. A large pressed-brick plant, with a fine equipment of machinery and kilns, costing many thousand dollars, was built, depending for its clay supply upon a bed of shale, practically full of sulphate of lime. This compound was present to such an extent that fine crystals of gypsum could be readily picked out. The result was not hard to predict. Not a first-class brick was made and a complete series of discolorations was produced. The high contents of sulphate also involved great trouble in burning the ware, great care being necessary to burn the brick without swelling. Owing to business energy and good management the plant has been kept going, but it is a failure as far as pressed brick are concerned.

Again, it seems strange that the question of soluble salts does not occupy a more prominent place in the buying and selling of clay land. A land owner would not dream of starting a mineral mine without carefully investigating the composition of the ores, the prospect of development, the cost of mining, etc. He would call to his assistance the chemist and the engineer in order to obtain definite data. But how is it with the clayworker? For the purpose of making front brick it should be known how much of the soluble salts is contained in the clay and no material high in such compounds should ever be used. The absence of ingredients giving rise to efflorescence should be equivalent to an increase in value.

In this respect the question of water supply also comes in, as much of the whitewash is due to salts present in the water used for tempering or moistening.

—Proper Method of Determining the Value of Clay Deposits.—

In starting a new front brick works it is obviously of great importance to know the kind, quality, variation and approximate quantity of the clay which is expected to be used. In order to arrive at this knowledge it is best to proceed systematically by means of test pits or drill holes. Digging can be practiced when the strata of clay has a large area but only a slight depth. It is best in such a case to dig channels or ditches running along the entire length of the clay land, in intervals of say, 150 feet, down through the bed of clay. In this manner it is a comparatively easy matter to test the clay at different depths, as well as to determine by simple calculation the approximate quantity of clay on hand. If the cost is too great to have the channels run the entire length of the clay deposit, they may be dug in intervals. A profile map should be made showing the different stratas of clay, their dimensions and direction. Where the claybed is deep and digging is out of the question, drilling must be resorted to. The drills, of course, are worked by hand and usually are so arranged that one tool, a steel cylinder about twelve or sixteen inches long, with a slit along its side, drills the hole as well as brings up the loose material. By means of this drill cylinders of clay are brought up, which represent the stratas at the respective depths. The tools vary in construction, according to the hardness of the material to be penetrated, and can be obtained from firms which make a specialty of this class of work. Where sand is encountered in drilling, the hole will have to be cased up with pipe, slightly larger in diameter than the drill, so that the clay sample is not contaminated with foreign matter. The samples thus obtained must be put in properly labeled boxes and kept for testing purposes. A record should be made of the depth of each strata, starting from a proper surface level as a basis which can be easily determined by means of a Y level. The holes should be arranged in regular order so that from the data obtained sections can be drawn which will prove of great value in the future. In order to obtain material for tests on a larger scale an opening will finally have to be made,

either a surface cut or a shaft. In thus locating clay beds examination of railway and road cuts as well as the use of geological reports will often give very desirable information. The next subject to be discussed is the proper testing of clays.

AMERICUS.

GOLDEN RULES FOR MERCHANTS AND MANUFACTURERS.

BY F. WAGNER.

—A Free Translation for the Clay-Worker from the Illustrated Gewerbe Zeitung.—

Hold your goods in esteem and don't slaughter them.
 Don't work more than your constitution will stand.
 Honor talent and don't try to make it the dollar's slave.
 Treat your workmen and employes as fellow creatures.
 Pay your bills promptly.
 Watch the progress of time and keep up with it.
 Keep an eye on your competitors, but watch your own business first of all, and adhere to your own principles.
 Let a fair profit suffice, but look for responsible customers, and sell for cash where possible.
 When selling on time study the character of the buyer as to honesty and ability, and don't slight small but responsible customers.
 Don't show too much anxiety to sell, and don't become the slave of your customers.
 Keep order in your books and in your bank account.
 Produce reliable goods only.
 Don't make everybody's way your own.
 Guard your reputation.
 Endorse no papers.
 Keep your office hours.
 Have your pencil ready.
 Don't squander your money.
 Save while young, so not to starve when old.
 Buy good material.
 Don't let your customers abuse you.
 Remember their peculiarities and the class of goods they buy.
 Evade slow payers and tricksters.
 Think more of the merit of your goods than of your old standing, that younger firms may not overtake you.
 Don't be hoggish. Give your competitors a chance to live.
 Break in young men. Fresh sprouts will help the old trunk.
 Further talent in order to further progress and yourself.
 Never lose courage during dull times. The earth is round.
 Don't waste time. Start early in the morning. Sleep at night.
 Give full measure.
 Don't split up your energy, but concentrate it principally upon one point.
 Time is money.

A GROWING BARN.

It is not often that a man builds a one-story structure and has it transformed from one to two stories almost without effort on his part, but this is said to be the experience of J. W. Fesler, who lives north of Morgantown, a village a few miles southwest of Franklin, Ind. He has a barn which threatens to develop into a "sky scraper." In 1891, having need of a new barn, he built a small structure and in its construction he used green willow posts at the corners and along the sides. These he sunk into the ground in the usual manner, says the Inter Ocean. For some time nothing unusual was noticed, but after a year he saw that whereas he laid the floor near the ground, it was now 3 feet above the soil. On examination he discovered that the willow posts, instead of being dead, as he supposed they were on putting them in, were in reality alive, and had taken root and were growing. In their upward movement they carried the barn along. He watched this with interest month by month and year by year. Of course, he had to build another barn, for it was inconvenient to use the constantly rising structure. Last spring the first barn was on stilts 9 feet high, and in August he put in a new floor and surrounded the posts with siding, thereby making it a two-story affair. There is now a space of 7 inches between the new floor

and the ground, and Mr. Fesler expects to have a three-story barn in course of time. He has built outside stairs to the second story. The neighbors come from miles around to see "Fesler's elevator," as they call it, and he and his barn are the subjects of a great deal of fun in and around Morgantown.

HOW LO MAKES BRICK.

An Unusual Sight at the Omaha Exhibition.

AMONG ALL THE wonderful things to be seen at the Trans-Mississippi and International Exposition, now at its very best, where there is a world of amusing and instructive sights that charm the eye of the most blasé of tourists, none seem to interest the visitors more than the Congress of Indians.

In an enclosure of several acres just beyond the Midway are

and with bows and arrows shoot pennies from sticks so long as the spectators furnish the pennies.

Some of the tribes have grass-thatched huts, while one tribe, the Pueblos, are making adobe or sun-dried brick with which to build a more aristocratic home.

—Making Brick with Straw.—

As our readers are particularly interested in this phase of Indian life, we picture them at work. The large view shows the first stages of the work, when they were just breaking ground and preparing to mold the first brick. A circular hole a few feet in diameter was dug, the top soil removed, the earth or clay loosened to the depth of a few inches, then water added, and after the mass was tempered slightly by treading with bare feet, a quantity of chopped hay or straw was mixed with it. Then a sufficient quantity to fill a wooden mold about 18 inches long, 12 inches wide and 3 inches deep is pressed into the box-



Indians Making Adobe Brick at the Omaha Exposition.

gathered representatives of all the prominent tribes, including many well-known chiefs, with their families and followers, numbering nearly a thousand, all told. Each tribe has been assigned space sufficient to enable them to erect their tents and spread their blankets in much the same fashion as they are wont to do in their native wilds. Here they build their camp fires and prepare their scanty meals with as little concern as though the swarm of spectators who line the ropes that keep back the too inquisitive were but so many flies. The old squaws trudge about their daily drudgery, or squat beneath their untidy tents, paying scant attention to the little papooses wrapped in blankets or strapped to boards or basket-like arrangements. The young bucks take some interest in the passing crowd, and frequently gather in groups of a dozen or more,

like affair, with handles or cleats across the end. When filled the top is smoothed with the hands, and the brick (?) is dumped on the ground and left until dry, or the builder is ready to place it in the wall. The smaller view shows the results of a week's work, the brick lying just where the molder dropped them. In the center may be seen a pile of the molds. In a dry climate these adobe brick answer a very good purpose, but a driving rain would play havoc with them very quickly.

If you want something you haven't got, or have something you don't want, keep an eye on our "Wanted, For Sale, etc.," columns.



Ninth Avenue near 14th Street, New York. Seven Years old.

Written for the CLAY-WORKER.

PAVING BRICK IN NEW YORK CITY.

THE VISITOR TO NEW YORK cannot fail to observe that there is a strange absence of brick paving. There appears to be some powerful hindrance at work which is able to prevent the introduction and use of vitrified paving brick for the roadways of the streets of this city. From all that can be learned by the writer up to the present time, the obstacle seems to be a lack of that peculiar influence which controls the contracting department of the Board of Public Highways. The asphalt paving makers have for years past been able to secure enough of that "influence" to obtain for them almost a monopoly of all the paving of the streets of New York, so that asphalt is the accepted paving material upon all those streets where cleanliness and quiet and easy riding is a chief requirement.

Some extensive attempts have been made to use asphalt upon the down-town or business portion of the city, but most of these attempts have resulted in disastrous failures, which have in no sense succeeded in maintaining any valid or good claim in favor of this material when subjected to heavy and continuous use for trucks and wagons. A noteworthy example of the unfitness of asphalt for road making under such conditions is shown upon the pavement of the new extension of West Broadway, between Chambers and Fulton streets. This specimen, although less than two years old, has from the very first months been undergoing constant and extensive repairs; creating serious obstruction of traffic, and being always full of broken and worn depressions, which collect water and mud with which to bespatter and spoil the garments of the foot passengers who are compelled to wend their way around those numerous lakelets to such an extent as to make the pavement a public nuisance.

In striking contrast to this miserable failure of the asphalt paving, there is a splendid example of brick paving upon the same thoroughfare near Fourteenth street. This brick pavement was laid about seven years ago by the Pyro Granite Paving and Brick Company, of New York. It has been subjected to exactly the same conditions of wear and exposure as the asphalt pavement referred to; both are covered by the Ninth Avenue Elevated R. R. and both are bisected by double horse-car tracks. Our illustration, which was photographed for the Clay-Worker on Sept. 17, 1898, will clearly show that this brick pavement is now, after seven years of severe use for heavy trucking, in perfect condition, and from all indications will remain so for an indefinite period. No repairs have ever been required or made. The traffic over both of these roads is ident-

ical in every respect. The asphalt road leads into Fulton Market, and the brick road leads into Gausevost Market.

This comparison of seven years of constant use and no repairs, against two years of frequent obstruction and costly repairs which began within a few months of its laying, is a remarkable and conclusive proof of the relative value of asphalt paving vs. brick paving, when given equal exposure and wear.

There are many other object lessons to be derived from the failures of asphalt paving in this city, which most positively demonstrate that it is that peculiar "influence," and not public utility, which determines the preference for asphalt as compared to paving brick in the city of New York.

Since this paper was prepared for the Clay-Worker, there has been published in the New York Herald, of Oct. 2d, 1898, an exposure of the operations of the so-called asphalt monopoly. As this is a subject for the serious study of every paving



Jamaica Avenue, Brooklyn. Two-years-old.

brick maker, it is surely allowable to make a somewhat lengthy quotation from that article, which appear in the New York Herald of Oct. 2, 1898, under the startling head

—New York Fleeced by Asphalt Ring.—

The system of excessive bidding by the companies in the ring is now being investigated. Estimates of Commissioner Keating, of the Bureau of Highways, for 1899 may include a requisition for an appropriation for the erection of a city asphalt plant.

The Herald may be able to aid in the investigation by presenting important facts gained directly from the Mayors of other cities. These statements show that the asphalt companies that have their plants in New York and lay streets here are paving streets elsewhere at reasonable prices.

—Low Prices to Other Cities.—

Companies in the New York ring are giving other cities asphalt streets at prices as low as \$1.80, and even \$1.70, a square yard, while they seldom take a contract in the Borough of Manhattan for less than \$3 a square yard. On one New York contract they have even obtained \$4.45 a square yard.

It is not necessary to go far to see what a large income the asphalt ring receives from Manhattan's treasury.

The average cost of asphalt paving in Brooklyn is \$1.77 per square yard. This includes concrete foundation and paving and a five years' guarantee. These figures come directly from N. P. Lewis, the engineer in charge of the highways in Brooklyn.

The specifications as they stand in New York to-day practically exclude all outsiders. The fifteen-year clause, the withholding of part of the pay until the fifteen years have expired and the usual provision that only Trinidad asphalt shall be used keep outsiders in the cold.

The following table shows what New York has paid per square yard, on an average, both with five-year and fifteen-year clauses in its specifications, for the years 1889 to 1896, inclusive:—

	Five-Year Guarantee.	Fifteen-Year Guarantee.
1889	\$3.55	\$3.91
1890	3.14	4.01

1891	3.05	3.88
1892	2.74	3.93
1893	3.13	3.84
1894	3.08	3.80
1895	2.84	—
1896	—	2.75

These figures are taken from the annual reports of former Departments of Public Works. An annual report was not submitted for 1897. Inquiry at the Bureau of Highways regarding contracts made this year was answered by Commissioner Keating's secretary:—

"Prices range from \$2.80 to \$3.60 per square yard."

This makes an average of \$3.20 a square yard.

The shameless manner in which New York is again being held up by the asphalt combination is plainly shown by letters received by the Herald from Mayors and City Engineers of cities in various parts of the United States.

The price of asphalt paving in the District of Columbia has been limited by act of Congress to \$1.80 per square yard. Washington is expending \$250,000 for asphalt paving, while New York frequently expends twice and sometimes four times that amount for paving in one year.

—Milwaukee's Cheap Pavements.—

A New York paving company has been laying in Milwaukee a three-inch street asphalt pavement, on a six-inch cement foundation, including the necessary grading, at \$1.95 and \$1.98 per square yard. The same asphalt is laid on seven inches of cement for \$2.24 a square yard.

The testimony of Robert E. McKisson, Mayor of Cleveland, is perhaps more interesting than the statements received by the Herald from the heads of other municipalities. He says that the average cost per square yard of asphalt paving on bids of 1898, in Cleveland is \$1.70, with a ten-years' guarantee.

Mayor Ford's letter giving the conditions in Pittsburg is another important piece of evidence against the New York combine. The average cost of street asphalt paving in Pittsburg is from \$1.70 to \$1.75 per square yard. The Alcatraz Paving Company is one of the concerns that has obtained Pittsburg contracts this year.

Chicago pays on an average \$2.25 per square yard for its asphalt

used to break the asphalt combine, and have proved successful.

—Brick Pavements in Brooklyn.—

In the borough of Queens, New York City, the asphalt has been successfully replaced by brick, and it is likely to hold its own. A journey through Brooklyn presents many examples of paving brick work, which give such evidence of permanence as to promise a great demand for good paving brick in the near future. It is an open field and is being supplied by the Catskill Co., N. Y., the Canton Co., Ohio, the Johnsonburg Co., Pa., the Mack Co., and some other smaller concerns. Several photographs have been taken during the month of September for the Clay-Worker which will show the present condition of some of these brick pavements. The Jamaica Avenue pavement is a wide thoroughfare about three miles long, of a light-colored block made by the Mack Co. This road is the Old Jamaica turnpike, and is one of the main thoroughfares leading through an agricultural district to the markets of Brooklyn, it also connects several towns to the city, so that consequently it has a very great amount of traffic.

On the Washington Avenue, and Nostrand Avenue, and the Parkway boulevard, there is another very excellent specimen of the red shale paving brick made by the Haigh works at Catskill, N. Y. This is about two miles in length. This red shale brick is very carefully laid and will do much to increase the use of paving brick in Brooklyn, and now that the cities are consolidated there can be no doubt but that it will cross the river into old New York.

In Eastern Brooklyn they have also begun to use brick for paving. One example was photographed for this paper. It is located on Lorimer street, near Bedford avenue. From encouraging words spoken at the office of the Engineer of Public Highways in Brooklyn it is reasonable to suppose that the consolidation of these cities under the name of Greater New York will lead to a great demand for good paving brick.

Brooklyn has begun the good work, and every brickmaker needs to be grateful to her Engineer of Highways, N. P. Lewis, for his evident disposition to give paving brick a fair trial and equal advantages with any other material upon the streets of the Borough of Queens, so that now we shall receive a just recognition as the makers of one of the very best materials for paving roads.

JAMES TAYLOR.

(To be Continued.)

Five distinct rollings are required with a scientifically-constructed macadam road—the earth foundation must be thoroughly compacted, each of the three layers of stone must be made perfectly firm and hard and the final dressing of stone screening must be rolled into the interstices.



Nostrand Avenue, Brooklyn, N. Y. Two years old.

paving. The required guarantee formerly was for five years; now it is for ten.

Baltimore's Mayor and the city engineers of Albany and Harrisburg tell of high prices for paving in their cities. Two dollars and twenty-five cents per square yard is what Baltimore pays on an average for its asphalted streets. Albany has been in the clutches of the Barber and Trinidad companies. The result has been that for the last five years Albany has abandoned asphalt paving and used brick.

When it is considered that there is such a corrupt influence operating against the interests of the people, there is no cause for wonder that the isolated efforts of the paving brick makers have made no headway in New York. However, "Right is Might," and will prevail. It were better that never a paving brick should be used in this city than that brickmakers should sell their conscience with their brick. But the time of paving brick is surely coming. Already the monopoly has destroyed itself in Albany, N. Y., and Harrisburg, Pa. Brick have been



Lorimer Street, Brooklyn. Three-years-old.

Written for the CLAY-WORKER.

PAVING BRICK IN ST. LOUIS.



ST. LOUIS was probably the first of the large cities to experiment with paving brick, as an effort was made to introduce brick here as far back as 1880, after two years of encouraging private work. This early attempt was stimulated by the poor quality of the macadam that St. Louis has always relied on as its chief paving material, or a soft limestone which is quarried within the city limits. While the first cost of macadam is very low, it has proved a very unsatisfactory and costly paving material.

It wears out very rapidly, requiring almost constant renewal under heavy traffic, while it is most annoying from the fine dust produced in dry weather, and from the atrocious, extremely liquid mud that it makes in wet weather—a mud that is not quite thin enough to flow down the sewers, yet so thin as to bespatter pedestrians twenty feet in front of a slow-walking team. On one street that was subject to considerable traffic, sufficient macadam was hauled on it to have raised the street twenty-two feet, or to the second story, had it not been hauled away monthly as mud, or blown away as fine dust. The urgency of improving such a wretched paving material caused the city fathers to try three kinds of so-called paving brick that were offered them in 1880.

One of these pioneer brick was common brick that had been



Washington Avenue, Brooklyn. Two-years-old.

boiled in tar, on the assumption that it was the frost, and not the wear, that disintegrated the brick, and hence if building brick was made impervious with tar it would bear wagon traffic. Another was made from a sewer-pipe mixture of fire clay, shale and top clay, which was salt glazed, but not vitrified. The third series was made of the St. Louis fire clay, which is famous for its high refractory qualities, and, therefore, it is practically impossible to vitrify it. It is needless to say that all the brick proved failures, especially as they were exposed to heavy traffic, as they all lacked the properties of a modern paving brick, although they were handicapped by being laid on boards as a foundation. The party who offered the fire-clay brick was not discouraged, and recognized that his brick were too soft; he made fresh efforts to manufacture a brick that would stand heavy travel. He ground his clay finer, burned his brick much harder, and produced an incipiently vitrified brick with his fire clay. On testing the brick in 1881 under heavy traffic, they made a most excellent record during the two years they were on one of the busiest streets in St.

Louis, but, as only a small patch had been laid, they were torn up to make way for granite, which was then coming into use in St. Louis. These same brick were subsequently relaid at the entrance of the Missouri Pacific freight yards on Seventh street, where they were subject to very severe service for over seven years. The pioneer who made these few most excellent pavers found it very difficult to produce brick of equal quality on a large scale, so that he was unable to secure the capital for making them for the market, and no further efforts were made to use brick for paving until 1895.

It is interesting to note that these very hard-burned fire-clay pavers, which withstood nine years of very severe service, absorbed 5.5 per cent. of water after twenty-four hours soaking, or they would have been condemned by 95 per cent. of the engineers' specifications of less than five years ago.

The reintroduction of paving in 1895 marks the dawn of a new but very promising era of St. Louis that promises to rid her of the ever-present annoyances and wear and tear that arise from the dust and mud of the limestone macadam, and from the heavy annual expense of keeping them in repair. Yet this step was only made after a long, hard, tedious fight by the few engineers on the board of public improvements and a few others who had become interested in paving brick from the evidence of the splendid results they were giving elsewhere. For the average citizen then only knew of the failure of the early experiments made in 1880, and was not aware of the enormous strides that had been made in producing from special clays or shales the modern paving brick on a large commercial scale, and the average St. Louisian is nothing if not conservative. It has been a case where the city authorities have had to educate most of the taxpayers to the advantages of paving brick, and hence the tardiness with which they have been introduced. The main credit for the coming emancipation from dust, mud and heavy outlays for repairs is due to the very valuable and highly esteemed body known as the Board of Public Improvements, which is mainly composed of engineers, and to whom is due the initiative in most of the progress of modern St. Louis. In trying to introduce paving brick, they were very stubbornly and actively opposed by the macadam contractors, by the granite pavers, and by the asphalt people. The macadam quarrymen early recognized that it would be a very severe blow to their business if the large quantities of stone required for the annual repairs should be done away with, and they have used all the means known to the active politician and lobbyist to defeat the introduction of brick. But right will finally prevail, even in municipal government, and the Board of Public Improvements have not only the satisfaction of seeing a rapid growth in the appreciation of brick streets, but also most flattering indorsements of their foresight and wisdom from some of the phlegmatic taxpayers who at first opposed them.

Private enterprise slightly preceded the city government in using paving brick, as the Burlington freight yards, the new Union Depot and a few private carriage ways were paved with brick in 1893 and 1894.

The first work was done by the city in 1895, when three and a half miles were paved, most of which was alley work. Local brands of brick were used, some of which were decidedly inferior, to the great detriment of the cause of paving brick, and at once creating a well-founded prejudice against their durability. The very inferior brands have since been kept out, with marked advantage to the cause.

In 1896 paving brick were more freely used, especially on the streets, when 6½ miles were laid, out of a total of 15 2-3 miles of new street work. In 1897 the total mileage of improved streets and alleys was 25 1-5 miles, and of this 13½ miles, or more than half, was paved with brick. Better brands of brick are being introduced from Illinois, Indiana and the Ohio Valley,

and paving brick can now be said to be firmly and permanently established in St. Louis.

It is being used in the second-class streets, or in the up-town residence district, and on the alleys, replacing macadam on the former and limestone block on the latter. Granite blocks are exclusively used on the down-town streets, asphalt on a few streets that are used as light thoroughfares, and macadam is still retained, on account of its low first cost, in the newer and cheaper outlying districts. Wood has been very carefully and thoroughly tried in St. Louis, and with such unfavorable results that it has been condemned for future use. The respective mileage of streets and alleys in 1894, or on the eve of the introduction of paving brick, and at the close of 1897, is herewith given, which clearly brings out the growth of paving brick and the big future in store for it in largely replacing the present macadamized streets, as well as securing quite a large percentage of the heavy mileage of unimproved streets:

	1894.	Per Ct.	1897.	Per Ct.
Miles of granite.....	50.63	11.1	57.83	11.1
Miles of asphalt.....	9.06	2.0	10.28	2.0
Miles of wood.....	8.35	1.8	7.93	1.5
Miles of macadam.....	300.04	65.9	339.80	64.9
Miles of limestone block.....	86.84	19.0	81.65	15.0
Miles of vitrified brick.....			24.98	4.7
Total miles paved sts. and alleys...	455	100	523.55	100
Total miles unpaved sts. and alleys	602.65		661 31	

The St. Louis brick streets and alleys have a six-inch concrete foundation, on which a 1½-inch sand cushion is laid, and a Portland cement grout (1 to 1) is used as a filer, and no traffic is allowed for seven days after grouting. Either standard brick or block sizes are permitted, but with the exception of a few 3 by 4 by 9-inch block, the work thus far has been done with standard size brick, which are repressed. The Board of Public Improvements first required complete tests to be made of the brick, requiring the filing of twenty-four samples previous to bidding, and the option of constant sampling and testing during the laying.

Their first specifications required a standard maximum rattler loss of less than 15 per cent. (old method), an absorption of not over 1.5 per cent., a cross-breaking strength of at least 2,400 pounds per square inch, a crushing strength of not less than 12,000 pounds per square inch, and a specific gravity of not less than 2.0. Since the work of the committee on paving brick of the N. B. M. A., to which the city of St. Louis testing laboratory was a very valuable contributor, under Mr. M. L. Holman, all but the rattler and cross-breaking tests have been abandoned, and at present the requirements are a rattler loss of not more than 30 per cent., in a rattler 28 inches in diameter run at 30 revolutions per minute for one hour, and a modulus of rupture of not less than 2,500 pounds per square inch.

The cost at present of brick paving in St. Louis ranges from \$1.30 to \$1.60 per square yard, whereas granite costs from \$2.50 to \$3, asphalt from \$2 to \$2.50, macadam from 50 cents to \$1, and improved Telford \$1.20 to \$1.50. Concrete foundation is employed under asphalt, wood and granite, except in a few alleys, where sand has been used under the granite. It will thus be seen that brick enjoy the very great advantage in St. Louis of securing a high-grade, clean, sanitary, easy traction, durable pavement at a much lower first cost than any other paving material except the cheapest macadam, and the latter has proved too short-lived, too extravagant in repairs and cost of cleaning, and gives too much annoyance from mud and dust to meet with consideration, except in only the poorest, light-traveled or outlying districts. The outlook for the future of paving brick is, therefore, very bright in St. Louis in furnishing a very large and continuous market, and it promises in time to redeem it from the stigma that it well deserved of having the poorest, dirtiest streets of any of the large cities of the world.

METROPOLE.

BRICK MASONRY.

PROF. IRA O. BAKER, of Champaign, Ill., has published a very valuable treatise on "Masonry Construction," which should find a place in the office of every contractor and architect. Brickmakers, too, will find in the book much information of practical value, one chapter being devoted to Brick Manufacture, Methods of Testing, Strength of Brick Walls, etc., etc. Price in cloth \$5.00.

Prof. Baker, whose pleasant face is pictured here is an exceptionally able engineer and a very forceful writer as our readers well know for he is an old time contributor to the Clay-Worker



PROF. IRA O. BAKER, Champaign, Ill.

and we hope in the near future to have new matter from his pen of special interest to paving brick manufacturers.

GOOD ROADS.

Those of Dirt are the Most Expensive.

Professor J. A. Holmes, of North Carolina, has written a letter on good roads, in which he says:

"Dirt roads are the most expensive roads that can be used.

"Macadam roads, properly constructed, are the most satisfactory and the cheapest roads yet discovered.

"Trained labor and competent engineering supervision are as important in building public roads as they are in the building of railroads, or any other special business.

"Convicts make cheap and satisfactory road builders, and every short-term convict in North Carolina ought to be at work on the public roads of the State.

"Hills and mud-holes, both of which are avoidable, are the two most expensive features about the dirt roads.

"All road work should be done with a view to its permanency. A poorly-built macadam road is largely a waste of time and money.

"Good roads are expensive, but in the long run they are far cheaper than bad roads.

"The bad roads in North Carolina to-day cost her people in labor and money but little less than \$10,000,000 a year, and yet over two-thirds of the counties in the State will refuse to levy a small pittance of a tax for good roads which would help throw off this terrible burden.

"This enormous bad-road tax is to-day the biggest factor in the industrial depression from which our people are suffering. It is as real a tax as any man ever paid. It is the largest tax we pay."



MAKING BRICK IN HOOSIERDOM.

HOOSIER brick plants, like Hoosier schools, Hoosier Presidents, Hoosier poets, Hoosier literature, or Hoosier talent or enterprise of any kind, average up to the top level of the best in the land.

If the reader questions this proposition in the least, let him come with us to any of the modern Hoosier plants, and he will thenceforth cease to doubt, and echo our sentiment heartily.

These reflections come as an aftermath to a very pleasant trip to the new works of the Marion Brick Works Co. at Montezuma, in company with Frank W. Butterworth, whose enthusiasm in all matters relating to up-to-date methods of brickmaking is inspiring. A visit to any old yard with Frank as company would be a pleasure trip, for he is good company at all times, but particularly when headed toward Montezuma, for there, until quite recently (see wedding announcement in August Clay-Worker), was centered his chief pride and joy, and, notwithstanding there is now a very strong counter attraction in Indianapolis, he still spends much of his time at the Montezuma end of the line.

Some of our readers may wonder why the Marion Brick Co.,

operating an extensive plant at Marion, sixty-odd miles north of the Hoosier capital, should build a plant at Montezuma, about an equal distance west of Indianapolis. In a word, it is the exigencies of the trade. The demand for the Marion brick made it necessary for them to increase their capacity, and, as natural gas is diminishing, they decided to go to the coal region, where there is an unfailing supply of cheap fuel and excellent clay. Indianapolis is their principal market, and they can ship there as readily from Montezuma as Marion. In fact, more so, for in the Indiana, Decatur and Western railroad they have a direct route from the former place, and



FRANK W. BUTTERWORTH, Assistant Gen. Manager—and the Letter that never came.

over a road which, though not so aristocratic and important, may be, as some of the trunk lines, is much more accommodating, and renders better service to those who locate along their line.

The old plant at Marion, which was built in 1887, soon after

natural gas was discovered there, is a soft-mud yard. The new works at Montezuma is equipped for the stiff-clay process. This is the first attempt to introduce wire-cut brick in the Indianapolis market, and not a few of the wiseacres prophesied trouble and failure for the venture, but they were all false prophets. Perhaps, with ordinary management, trouble might have followed such a radical departure from an established custom, but, under the direction of Mr. Frank T. Melcher, the general manager of the plant, difficulties that would stall the average man were but trifles light as air, and now, after a few months' use, the contractors and masons are finding that stiff-clay brick are just as good and desirable as the old hand-made or machine-molded article, a trifle more trouble to lay, may be, because more difficult to cut, but this is made up by the freedom from waste or bats. Being side-cut brick, they take mortar readily, which perhaps would not be the case with end-cut brick.

—The Works at Montezuma.—

Sixty miles west of Indianapolis there lie immense beds of the finest of clays and shales, and beneath them are rich veins of coal, which for years past have been mined and shipped in large quantities. Here, near the town of Montezuma, on a side-track of its own, is located the new plant of the Marion Brick Co. They have 122 acres of land, with ninety-five feet



The Swift Coking-Table Furnace Kiln.

of workable material, mostly shale; so, long years after the present operators have passed away, their children's children may continue the making of brick, with no fear of exhausting the supply of raw material.

They are now working the shale to a depth of twenty-five feet. It is hard and rock-like, but a Marion steam-shovel eats into the bank with ease, taking at each bite a strip three or four inches in depth from top to bottom of its face, and deposits it in cars, which dump automatically from each side when the proper point on the trestle is reached. The cars are hauled by cable up over a high trestle. As they pass into the clay house, a trip releases the catch-pin or hook, and the sides swing out and up from the bottom, being hinged at the top, and the shale falls into an immense bin or storage-room with openings at the bottom, near which are three Frost dry pans. The bin holds enough clay for a week's run, so they are never delayed by inclement weather. The pans are the heaviest made by the Frost Engine Co., Galesburg, Ill., one of which is illustrated on page 324, and do the work to perfection.

From the pans the pulverized clay is taken in cup elevators to the floor above, and, without screening, goes into an American Clayworking Machinery Co.'s open-top pug mill, some eighteen feet in length, where water is added, and the mass is

thoroughly pugged and fed into a large Chambers single-stream brick machine, which turns out 85,000 brick per day. An American Clayworking Machinery Co.'s automatic side-cutting table cuts and separates the brick, which are carried along on an off-bearing belt a hundred feet or more in length, along one side of which are ranged three large Eagle represses. It was the intention originally to repress the entire output of the plant, but the bricks are so square and perfect in form that this idea has been abandoned. The brick are taken from the belt and piled on double-deck cars and run into a Chicago iron-clad dryer. There are four four-track tunnels about one hundred feet in length, giving them ample drying capacity. From the dryer the brick, bone dry, go to up-draft kilns.

For a time they burned in common clamps, desiring to test their clay and become thoroughly acquainted with it before building permanent kilns. Having done this, this summer they built seven of Swift's up-draft kilns. Six of them are built in a line at right angles with the dryer. They are 33 brick wide, 24 arches to the kiln. They now set 46 high, giving each kiln a capacity of 400,000 brick. By using the Swift furnace, they are enabled to watersmoke and burn entirely with slack coal, the entire operation consuming ten or twelve days. To say that they are pleased with the Swift kiln is putting it very mildly. Mr. Butterworth grows enthusiastic whenever he broaches the subject. He says he never expected to burn brick with coal as cheap as they are doing at Montezuma, and this, too, despite the fact that the clay is difficult to burn. Setting 46 high, there is a settle of 18 inches or more. Nevertheless, the brick stand up well, and they have no trouble at all from sticking. For a time they used a double course of platting on top, and, when the fires were well through the platting, covered the top of the kiln with clay. This, while effective, was objectionable, and they have of late used but one course of platting, and then at the proper time covered this with sheet asbestos, which is just as effective and much easier handled.

From the kilns the brick go direct to cars, their entire product being shipped by rail. The bulk of the product of both plants is shipped a distance of 60 miles, and it is not an uncommon thing for them to ship to points 100 to 200 miles distant. This reminds the writer that when, a few years ago, he expressed the opinion that eventually common building brick would be shipped by rail to large markets from distant points, he was considered visionary and impracticable. There is a railroad siding extending the entire length of the kiln shed, which is 600 feet long and very substantial in appearance, as is everything about the plant.

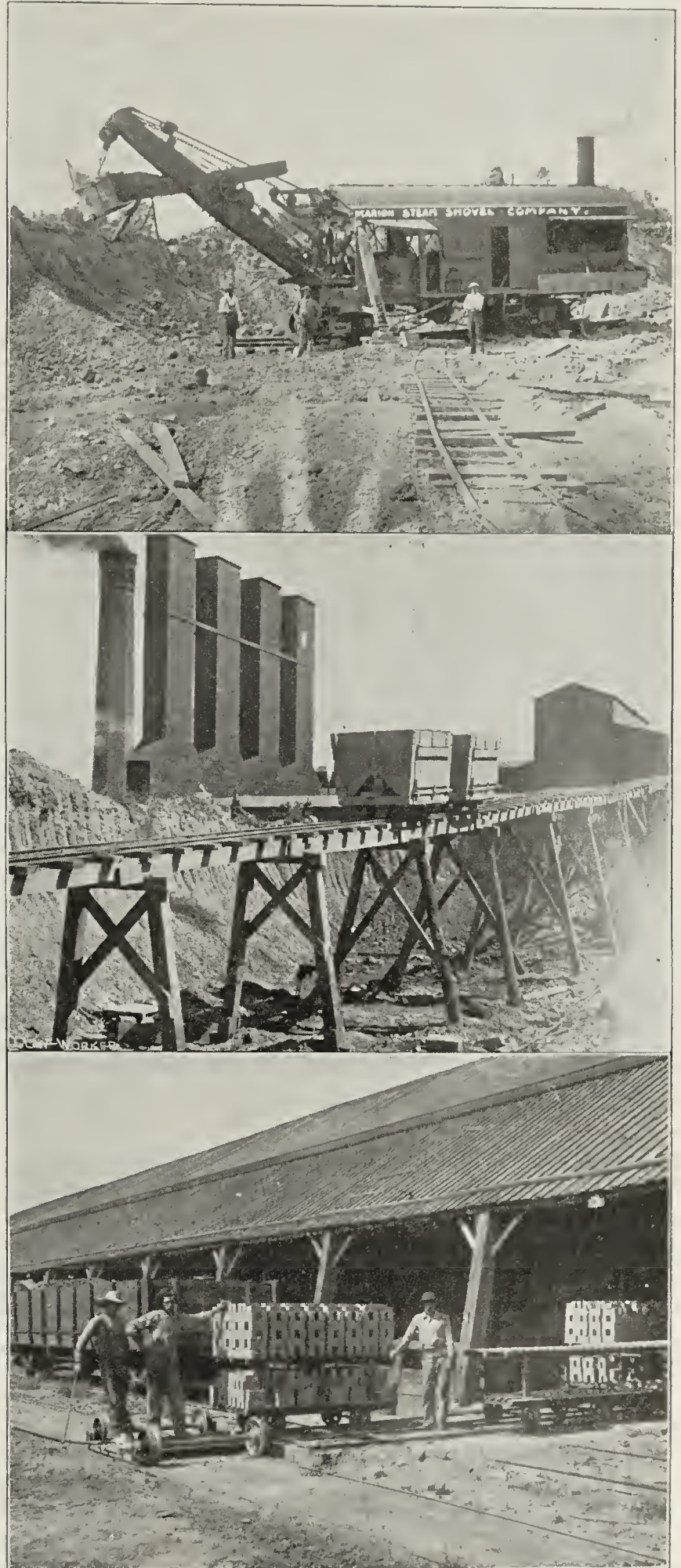
A commendable feature is a complete system of water mains which extend to every part of the works, with hydrants at convenient points, affording ample protection against fire. The water is pumped from a crest into an immense tank placed at a point 95 feet above the level of the works. Two Dean pumps of large capacity are so placed that they can be connected direct to the water mains if necessary.

Their boiler and engine capacity is much greater than is actually necessary, so there is no unnecessary strain on the seat of power, but everything runs easy and smooth.

The plant as a whole presents a very pleasing appearance, every detail being well planned and substantially built, the engine, boiler and machine houses being built of brick. Above all towers a fine brick stack 91 feet high, which is the admiration of the native inhabitants, all of whom regard the brick plant as a great concern, and well they may, for it gives remunerative employment to a large number of workmen. The pay-roll includes nearly one hundred names. Heading the list is S. S. Curry, the superintendent, who is the right man in the right place.

He who conceived the plant and has carefully watched and superintended its erection and operation, Frank T. Melcher, is a past master in the art of brickmaking. He comes of a family

of brickmakers, his father having been a pioneer in the business in Philadelphia, where the name Melcher is familiar to all connected with the building industries. During the summer Mr. Melcher's health failed, and he is now in the mountains of Eastern Pennsylvania, with every prospect of recovery.



At the Clay Bank—Hauling in the Clay—From Dryer to Kiln.

His open-handed generosity and cordial manners win the good will of all who know him. A host of friends throughout Hoosierdom will rejoice to learn of his complete recovery, and gladly welcome him back among them.

You aren't whipped till you cry "Enough!" You haven't failed till you cease trying.

Written for the CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN.—No. 7.



RELIMINARY to the subject of burning, I should like to emphasize a few ideas of some of the former numbers of this series. Thorough drying in sheds, on the yard or in dryers, is absolutely essential. In fact, of so much importance do I consider this subject that I am of the opinion that the man who has the best dryer should be able to make the best bricks. Slow drying has proven of great value to our clay. A rapidly dried brick, even when no checks appear upon the surface, is never so sound and strong as one dried slowly. For our clay, five days is rapid drying, and ten days as rapid as we aim to secure, while much of our product stands in our large sheds for as long as thirty days before being taken to the kilns.

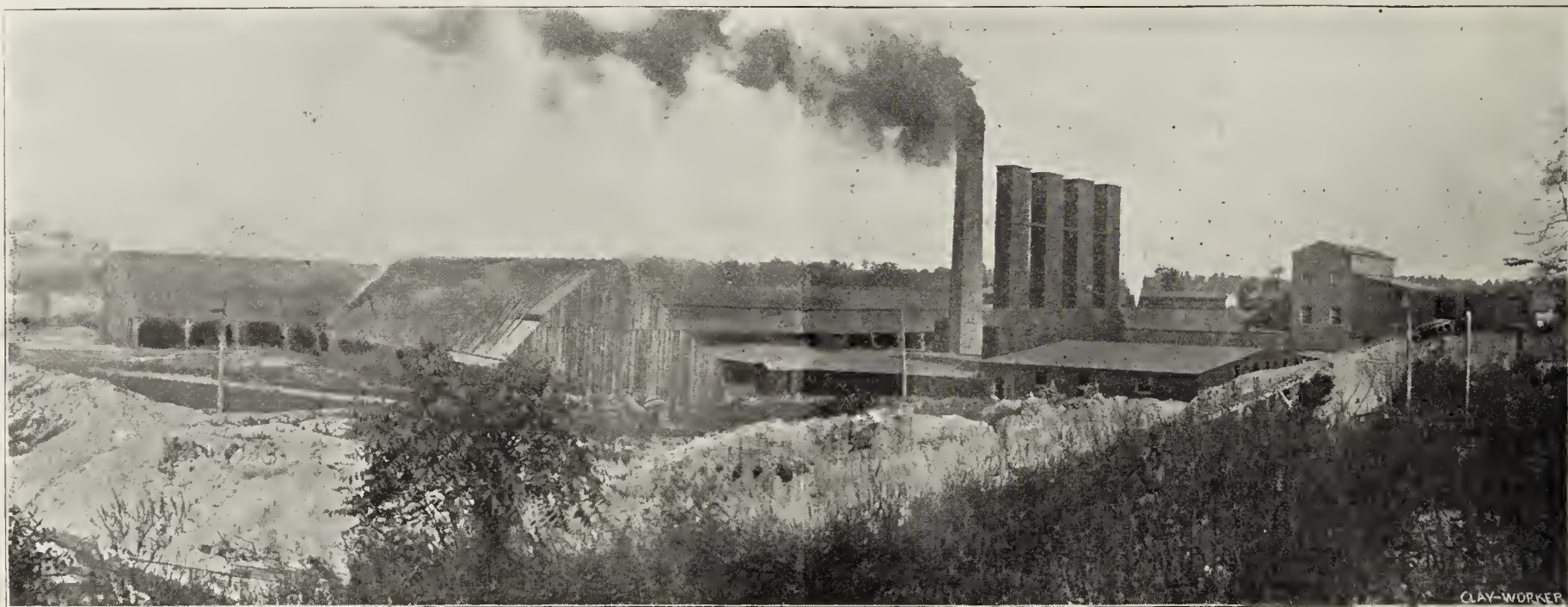
Take these well-dried bricks, set them in the kiln so that there is an open, free and even draft in all parts of the kiln, and you are ready to start the fires.

We have to proceed very carefully with our first fires, on account of the tender nature of our clays. It takes us about five

after they are exposed to the weather. But our remedy is of no assistance to our neighbor, for his bricks are a good red when taken from the kiln, but change color when stacked upon the yard or built into a wall.

We are troubled with swelled bricks only when we get too much vim into our burners. "Make haste slowly" is our only safe rule. When satisfied it is safe, we begin hard firing. Brisk fires are kindled in the outside furnaces and in the center of the arches. Gradually the heat is raised to a greater and still greater degree, until the arch bricks are almost as hot as they will bear without melting. Then is the period for the burner to do careful work and use good judgment. Too rapid firing at this stage of the burning would melt the arches, cause the overhangers to tumble and give serious trouble to the burner as well as to entail considerable loss from over-burned bricks. Only the experienced eye can decide when the heat has reached that degree called the danger point.

In starting a new plant, or making a change of clay banks, even the most experienced burner may make serious mistakes before he learns the fusibility of his new material. And as a certain famous artist once said, when complimented for his skill, he spoils bushels of eyes in learning. However, in burning one kiln, if he has good judgment, he should gain suffi-



The Marion Brick Co's Works at Montezuma, viewed from the Top of the Clay Bank.

days to watersmoke a kiln of brick without damaging them in some way. Before attempting to raise heat in any great degree, we have to be sure the water is all off. And our safest plan we have found to be to bring the whole kiln, from bottom to top, to the boiling point before we commence rapid firing. Then we are sure the water is all off, and rapid firing after this period has never resulted in injury to the products in any way. Hard firing before the watersmoke is all off produces many evils—shaly bricks, cracks and warps, whitewash and swelled bricks.

There has been of late so much discussion of the subjects of whitewashed and swelled bricks, and the causes of these evils, that I am almost afraid to enter this field. I have no fine-spun theories to advance, no medicated remedies to suggest, no scientific terms to enlighten or befog the cranium of the average brickmaker.

I know there are different causes for whitewash. What causes whitewash on our bricks is not the same that affects our neighbor's ware, for his bricks whitewash after being exposed to the weather, while ours come out of the kiln in that condition. There are different causes, and there may be different remedies. We have tried but one remedy—careful water-smoking—and that never fails in our case. The bricks come out sound and red, and the efflorescence never appears on them

cient knowledge to enable him to proceed with subsequent burns without danger of serious mistake.

But he may have to make several burns before he learns to handle his clay to his entire satisfaction, if, indeed, he ever succeeds in doing that. I think the most experienced burners, and the most skilful, will unanimously admit that they need some sure guide, some never-failing measure, for the heat of a kiln. We have never used a pyrometer of any kind, but have to depend entirely upon our judgment from the color of the heat. Of course, we make some mistakes, some over-burns and vice versa; but long and careful observation has enabled us to make our burns very satisfactory. After heating the arches to the required degree, we hold the fires steady, and aim to maintain about the same heat until the top courses are at nearly the same degree.

For a long time we followed the old plan of judging from the settle when our kiln was burned to the required hardness. But, after making many failures, we discovered that our clay did not shrink to any noticeable extent until it reached its fusing point. Most of the settle was not from shrinkage of the ware, but from melted, twisted and tumbled arches. We saw that shrinkage was no criterion for us, and for years we have not taken the settle into account when deciding to close our furnaces. We depend entirely upon the color of the heat,

and when the top courses reach the required heat we close and seal the furnace doors, place dampers over the flues in the brick roof, seal them with mud, and call that kiln finished.

L. C. M.

Written for the CLAY-WORKER.

WHAT KILN SHALL I BUILD?



IN AN ENDEAVOR to answer intelligently this question, the writer commenced an investigation many months since, which has continued to date. It ceased to be a question upon which to base his own immediate action sometime ago; but the interest which the search for the best had awakened, and the conviction that no one question which comes before the clayworker is of larger moment, or has more to do with his success or failure, has been a constant stimulus and incentive to continue the quest. It is with the hope that others who are asking the same question may be saved some of the labor and expenditure of time and means which are involved in such search that these papers are projected.

amount of fuel used in the attempt to accomplish like results. As, for instance, we have been favored with the examination of carefully kept daily kiln registers, from which it would appear that ten tons of coal, as an average, was sufficient to burn satisfactorily a twenty-six-foot round kiln of vitrified salt-glazed pipe, while in other localities we have, in answer to our inquiries, found "about fifteen tons" of coal used in the production of unglazed hollow wares in twenty-two-foot kilns. In such establishments no kiln or fuel accounts have been referred to in answering the question asked, and when the suggestion of the value of a kiln account has been made, it has been brushed aside as "too much trouble," "require a book-keeper," etc.

It has been evident that a 50 per cent. difference (and even greater) exists in the use of fuel, in practice, and that, after making due allowance for difference in character of fuel and in demands upon it by some clays as against others, and for good or poor firing, a difference of 25 per cent. may often be set down to the difference between kilns, while it may also be stated that an equal loss or saving of fuel may often be accounted for by good or poor firing.

It is obvious that a good kiln may be made an instrument for piling up a balance on the wrong side of the profit and loss



Marion Brick Co's Works at Montezuma, Side View.

The clayworker who is not a fossil, if he be engaged in the manufacture of wares which demand better treatment than can be secured to them in clamp and continuous kilns, will never have dismissed the question until he shall have found a kiln that will give him an average of 100 per cent. of No. 1 wares, with the lowest known expenditure of fuel for a given output, for however short of perfection we may come in practice in our efforts, we aim at it, if we be live men. Hence, the question is a living one, and the young clayworker is quite sure to grow grayheaded while still in pursuit of an answer.

We shall make no attempt to single out any one kiln and present it as the nearest approach to a solution of the question which we have been able to find. We leave such treatment to the man or men who are each building "the best" and who can each save you from 25 to 40 per cent. over any other by the use of their kiln. This is not said in a spirit of disparagement, for these gentlemen have done much for the clayworkers of the country, and with the builders of clay machinery are, many of them, important factors in the rapid development of an industry, which but a few years ago was generally relegated to the unthinking plodder, while it now stands among the foremost industries of the country.

In our investigations it early became apparent to us that in practice there is a very wide margin of difference in the

account, if not properly handled, and hence we have come to the conclusion that we must, in any treatment of our subject, give equal attention to the proper use of fuel and its product, heat, as to the kiln itself, if we would be of any service to those in whose interests we write.

We have become aware that a slovenly habit and an indifference to the character and condition of the kiln, and to the methods pursued by the burners, are often begotten of the use of cheap fuel and easily and inexpensively mined clays. The best practice has been found where coal was costing the users \$2 per ton.

It may not be amiss to state in this connection that the writer's first experience was gained at a point where the fuel bill was as great as all the other expenditures of a clay manufacturing plant combined, including the cost of selling the product, and this not because of waste or carelessness in handling fuel, but in spite of it—coal costing an average of over \$8 per ton; hence arose an early appreciation of the need of the closest scrutiny of the expenditures in this department. Were we to confine ourselves to the delineating of our own experience, we would hardly be able to do justice to the subject. We shall draw freely upon the experience of others who stand among the recognized leaders in the industry, as detailed by them in National and State gatherings of clayworkers, and as

secured by correspondence, also upon what has come under our own observations reaching from the Atlantic to the Pacific, and we hope not to neglect the simple principles underlying all successful working; for, after all, success in this, as in all other departments of mechanics, depends upon the degree of our compliance with nature's laws—the divine laws—which, obeyed, bring success and, disobeyed, bring failure. If there be any who are disposed to question this proposition, we would remind them that the mechanic who ignores either the laws pertaining to friction or gravitation will utterly fail. The large introduction of ball bearings is in answer to the inexorable fiat of natural law as it relates to friction. Equally is this true of the laws of combustion. Nature says: "Give me two parts of oxygen to mate one part of carbon if you want heat," and experience tells us that one will not answer, and, if we admit three, it will be at a loss to ourselves. Therefore, the wise man will stop to inquire first, "What saith the law?" and then will constantly in his practice seek to regulate his action by it, and, should failure come, will inquire, "What law of nature has been disregarded?" Hence, a skilful burner is one who, having discovered nature's secrets, either by study and experi-

of things." Perhaps he sees the evidence about him of previous failures, and he knows he is expected to apply the proper remedy for a cure. He examines the kilns. Are they in good order? The floors, these are not as open as he has been accustomed to; the furnaces, the grate surface seems large or small; the draft, etc., etc. If he be a man of good judgment and self-reliant, he will make some changes before he makes his first burn, after having ascertained, as far as he is able from others, what have been the difficulties and what has been the previous practice. He is conscious, however, that he has entered upon a series of experiments more or less costly. He may score an early success, but he feels there is a large chance of failure.

On the other hand, take a man who is thoroughly familiar with the laws of combustion, and, to a reasonable extent, is familiar with their practical application, he, too, examines carefully the conditions about him, the evidences of previous failure, the general character of clay and fuel; does this under-burned or over-burned rubbish pile tell of faults in the setting of the wares? or of carelessness on the part of the former burner? or does it tell of unequal draft? In search of answer a section of the kiln floor comes up, and the area of grate sur-



Superintendent S. S. Curry, the right man in the right place, and a couple of his humble Assistants.

See page 270.



ence combined or experience alone, has brought himself into harmony with her requirements.

We are living in a day in which we cannot afford to waste our time or our money in acquiring "rule of thumb" experience. And the interest taken in the school for clayworkers at the Ohio State University is a practical recognition of this fact. We do not intend to underrate experience or the unscientific practical clayworker. All honor to those who have fought their way to success over the rough road of experience, guided by observation. They may not know what the books say about carbon or oxygen, but they will most certainly desire their sons to take a shorter cut and a smoother road than they themselves traveled.

Perhaps a simple illustration may make plain what we desire to impress upon our readers, viz., the value of a foundation of knowledge concerning the laws of combustion as against mere experience. The man of experience only works admirably when he occupies his own familiar camping ground. When he makes use of his own clay, his own kilns and his own fuel, he is master of the situation; but, bring him face to face with other kilns, clays and fuels, with no past experience in their use to guide him, and he is aware that he must begin a series of experiments before he has a very sure footing, and looks forward to under-burned or over-burned or unequally burned kilns as a thing to be expected until he gets the "hang

face and flue area come under observation. He examines and determines the area of the main flue, and the diameter and height of stack. It is not altogether a matter of judgment. He whips out a pencil and tablet to determine the question, is there proper proportion between grate surface, floor openings, flues, etc.? He examines the furnaces and bags to determine whether the conditions are such as to insure perfect combustion, and, when the diagnosis is made, such changes are made as gives him confidence that intelligent setting and firing will bring a satisfactory result.

We hear much said in conventions and elsewhere about the uncertainties attendant upon the burning of new clays. Our good brother Crary once said: "The eccentricity of clay is wonderful," and many stories of tribulation reach us in connection with the starting of new clay enterprises, most of which would have no existence except for this "cut and try" method, in place of the employment of methods based upon known laws. We are reminded of the old story of two honest farmers who sat down together to adjust their accounts. After considerable figuring, working on independent lines, they reached results with but a few shillings of difference, when one of the parties proposed settling by "splitting the difference," giving as a reason for so doing, "That's as near as figgers ever come." When will we learn to treat the clayworking business on some other basis than this? The answer is: When we base

our investments and construct and run our plants upon the ascertained facts of science, wrought out, if not in our own experience, in the experience of others, which, in a large sense, we may make as available as if our own.

But, says one, I have not the scientific equipment, and it is too late to acquire it. In many cases this may be true, but we write for the young, who are constantly stepping into the places of the old, and who should keep pace with the new order of things.

Very few young men can avail themselves of the facilities which are afforded by the Ohio University, but those who cannot may, by careful study of the columns of the Clay-Worker and other current clay literature from month to month, make themselves masters of the fundamentals.

We take occasion to make acknowledgement of our own indebtedness to one who was long a contributor to the pages of the Clay-Worker, but who recently laid aside forever the pen of instruction he knew so well how to wield—Wm. Waplington. In his series of inimitable "Letters to Will" and in those on "Chemistry for Clayworkers," he has performed a service that should keep his name in grateful remembrance. With equal heartiness we commend a series of articles on kiln combustion, etc., which appeared in the columns of this journal some years since from the pen of D. W. Stookey. We have often wished the papers written by the two gentlemen mentioned might be revised and incorporated in a volume, giving them permanent form as a text-book for the younger clayworkers of to-day, as much that is found in them will never go out of date, being a statement in attractive form of foundation truths.

The young man who can place his hand upon old files of the Clay-Worker which contain these papers, and who will digest the contents of the monthly issues of this journal and make his practice conform to such instruction as he may gather from them, has opportunities second only to those enjoyed by the favored few at the Columbus University.

Without a thought of laudation, we think we may further say of this magazine there is rarely a month in which the matter it contains is not worthy of being made a subject of thought and study until the next number appears, and as to the State and National convention numbers they should be kept in a handy place for reference the year through. At any rate, we practice what we preach.

Excuse our seeming round-about way of approaching a definite handling of our subject. We have written in the interest of a fair understanding of our point of view, and with the hope of encouraging a more careful study of the general principles upon which a direct road to the successful firing of clay wares may be laid.

We desire no controversy with those whose requirements are met in the use of clamp or open-top kilns, or, indeed, with the promoters or users of continuous kilns, for even the warmest advocate of these kilns for common wares, by almost universal consent, agree that a high-grade front brick, or a high per cent. of vitrified pavers, cannot be depended upon in the use of them. In these days in which the architect is looking for "shades" and "tones" as well as colors ranging from white to black, and in which colors free from the deadening influence of smoke bring a premium over other wares of equal merit otherwise, and in a day in which the specifications for paving brick and the inspection of them demand a Philadelphia lawyer to perform the one and a trained expert the other, the question, "What kiln is best adapted to meet these exacting requirements?" has been pressing for an answer. It will be proper and in point to show

—How This Demand Has Been Met,—

In large part, at any rate. Professor Orton, in the Clay-Worker of 1895, is made to say: "So far the production of paving material has been almost exclusively from down-draft kilns. Experiments have been made with up-draft and continuous kilns,

but without much mercantile success to date." In the May issue of the same year he gives tables of the kilns in use in Ohio. Those connected with the paving and sewer-pipe industries may be classified as follows: That out of 812 down-draft kilns, 621 were round kilns, the paving brick kilns having an average diameter of 25 1-10 feet and the sewer-pipe kilns 27 3-10 feet. So far as the writer's observation goes, the same conditions largely prevail in other States. In the three years which have elapsed since this summary was given, new developments have been largely on the same lines, as any careful reader of the clay magazines will be able to testify.

Before entering upon the arguments for and against the use of down-draft kilns for the purposes we have mentioned, let us give the testimony and admissions of pronounced advocates of up-draft kilns. In the September issue of this magazine, R. B. Morrison, who is himself the owner of a patented up-draft kiln, writes: "I believe that brick can be subject to a higher degree of heat, with less danger of warping or sagging out of shape in a down-draft than in an up-draft kiln." In April of the same year, writing over the signature of "R. Brick," he says: "When dry pressed brick are made only for face brick, it is probable that a larger per cent. could be obtained from down-draft kilns, for the reason that those subject to the highest degree of heat have least weight to sustain."

The left-handed compliment paid by that sturdy advocate of up-draft-burning (Father Crary) to the down-draft kiln is, after all, a most important admission, and is a truth worth noting here. "The unskilled burner can practice with less loss than with up-draft kilns," he wrote in his paper contributed to this journal in September, 1895. (It will be remembered that in that year the controversy over kilns was unusually lively.) The logical deduction from such a premise is that more uniform and better results may be expected under all conditions of attendance. Yours, FLAME.

ACTIONS SPEAK LOUDER THAN WORDS.

TWO MEN have developed out of the war situation who are pre-eminently men of action rather than of words. One of them is "fast and furious Dewey" and the other General Wood, of the Rough Riders. Admiral Dewey has shown a contempt for long-distance telephones and other instruments for the encouragement of chin music, which excites our admiration for beyond our feeble powers of expression. Even the mail is looked at askance by the great fighting admiral. His report of the battle of Manila was a simple statement that an engagement had taken place, and that he had sunk the following vessels of the enemy's fleet, and then followed the names of the ships. About a dozen lines contained the announcement of one of the great naval victories of the century. And since then we have heard from him principally through his actions rather than his talk, as witness the incident at Subig Bay, when he dispatched two cruisers and gave them peremptory and unqualified orders to take the island. He didn't telegraph for instructions nor hold a pow-wow with the department.

In fact, we cannot help noting the absence of messages from Dewey. There have been no complaints, no consultations, no telegrams, no talk. Not a word of criticism about reinforcements, or supplies, or repairs, or delays, or the climate. Neither the unreliable insurgents nor the discourteous Germans have disturbed this man's equanimity in the slightest or changed his plans. In the midst of it all he writes home to his sister in the little New England village that his health is good, and he can stand any amount of hard work. Evidently this man does not talk; he fights. Admiral Dewey is a typical American sailor, and is a direct successor of Paul Jones, Perry, Decatur and Farragut. Viva el Almirante!

Another man of the same kind is Colonel Wood, of the Rough Riders. When his command was surprised and set upon by the enemy in overwhelming numbers, the excitement of the soldiers expressed itself in the vigorous language of the camp. "Don't swear—fight!" was the pithy rejoinder of their officer, and under his lead the brilliant action of San Juan hill took place.

When business is dull, "don't swear—advertise!"

Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 7.

Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

DARK BLUE DESIGNS. UNKNOWN MAKERS.

MANY OF THE BEST printed American views on old English china were never marked with the names or initials of the makers or of the factories, while others were only occasionally so distinguished. Why manufacturers should have been unwilling to attach identifying marks to their wares is difficult to understand. It is possible that some of them were super-sensitive about placing themselves in a position to invite criticism for catering to the American trade, so soon after the war of 1812. Be this as it may, it is impossible at this late day to determine the origin of the greater number of the former, while the latter can only be identified when an occasional marked example happens to turn up. For instance, the majority of designs produced by Joseph Stubbs did not bear his name, but by means of the few which are found with the word Stubbs impressed in the body of the ware all dark blue plates possessing the same eagle, scroll and



"A View near Philadelphia." (On Schuylkill River.)

flower border may be confidently assigned to that maker, for it is a singular fact that while competing potters of that period did not hesitate to appropriate each other's central views,—the most important parts of these engravings,—no instance is known where one manufacturer used the border device of another. This seems to have been considered the individual property of the factory which originated it, and by a sort of mutual understanding or tacit agreement it was as proof against infringement as though protected by copyright or patent. Strict originality of design was confined to the marginal embellishment so that, while some of the floral groupings possessed more or less similarity, they were always quite distinct and characteristic, and they can readily be distinguished by the observing collector.

It is quite probable, therefore, that specimens of some of the designs, listed here among the productions of unknown makers, may be found bearing identifying initials or names. Thus, entire series of designs, possessing a common border, may be identified hereafter through the discovery of a single example, so marked.

LIST OF AMERICAN DESIGNS BY UNKNOWN MAKERS.

—Designs in Dark Blue. Border, Large Flowers in Four Groups of Two Sorts.

"A View near Philadelphia."
Buenos Ayres (South America).



"Wright's Ferry on the Susquehanna."

Hobart Town (N. Y.).
Louisville (Ky.).
Near Fishkill (N. Y.).
Philadelphia (showing Penn's Treaty Tree).
Quebec.

Washington (City).

Wright's Ferry on the Susquehanna (from an engraving published by Longman, Hurst, Rees, Orme & Brown, London, 1812.)

—Designs in Dark Blue. Border, Fruits and Flowers.—

Baltimore, Court House.

Baltimore, Exchange.

Philadelphia, The Dam and Water Works (stern-wheel boat).

Philadelphia, The Dam and Water Works (side-wheel boat).

Among the most interesting blue designs are those which possess, at the upper margin, medallion portraits of Revolutionary heroes, such as Washington, Lafayette and Jefferson.



"Baltimore Exchange."

with different central views. These were, doubtless, produced by more than one potter. On some the name of Clews is said to have been found, while others, judging by the border pat-

terns, were probably made by R. S. W. or A. Stevenson. Plates bearing these portraits are so uncommon that it has not been possible to complete a list of them, and, because of their somewhat uncertain origin, those that have come to my notice are here grouped together.

—Various Border Designs.—

Washington and Lafayette at top, City Hall, New York, in center, entrance to Erie Canal at Albany at bottom (Probably by R. S. W.).

Washington and Clinton at top, Capitol, Washington, in center, entrance to Erie Canal at Albany at bottom.

Jefferson and Lafayette at top, Capitol, Washington, in center, view of the aqueduct bridge at Rochester at bottom.

Jefferson and Lafayette at top, remains of Covetham in center (Probably by Clews).

Washington, Lafayette, Jefferson and Clinton around margin, Faulkstone Hall in center, view of the aqueduct bridge at Rochester at bottom (Probably by A. Stevenson).

Jefferson and Clinton at top, scene in Albany in center, view of the aqueduct bridge at Little Falls, N. Y., at bottom.

MISCELLANEOUS DESIGNS IN DARK BLUE.

—Various Border Designs.—

"American Villa;" border, fruits and flowers. (Not an American view.)

Baltimore, Almhouse; floral border.



"The Dam and Water Works," Philadelphia, (Stern wheel Steamboat.)

Boston Harbor (so-called). Large eagle and shield, with distant view of a city.

Connecticut, Arms of State (gravy tureen). Marked on base, "Oliver Stoke."

Erie Canal at Albany.

Erie Canal. DeWitt Clinton Eulogy in center. Border, canal boats, etc.

Erie Canal at Little Falls, N. Y.

Erie Canal at Rochester.

Erie Canal at Utica (1824).

Fulton Market, New York.

Fulton's Steamboat (so-called), primitive steamboat with tall smokestack.

Hartford, State House.

Lafayette (bust, in uniform). "General Lafayette, welcome to the Land of Liberty; vine-leaf border.

Lawrence Mansion, Boston.

Mount Vernon, "The seat of the late Gen'l Washington." (Washington standing beside horse.)

New York, Castle Garden; set border, trefoil and knobs.

Philadelphia, United States Hotel; border, foliage and flowers.

Savannah Bank; vine-leaf border.

View of Washington from Mount Vernon.

York Minster (English view, showing vessel flying American flag). Border, thistle, rose and shamrock.

BENJAMIN FRANKLIN'S SAYINGS.

Many of the English potters manufactured cheap white crockery for the American market with engraved devices illustrating the "Morals," "Proverbs" and "Maxims" of Franklin. These were made principally for the use of children, in the



Don Quixote Platter, "Peasant Girl Mistaken for the Lady Dulcinea." Collection of William A. Cooper.

forms of small drinking mugs and plates of circular or octagonal shape. They are found in such variety and numbers that collectors are slow to commence collecting them. The most familiar are given in the following list:

FRANKLIN'S MORALS.

—Designs in Dark Blue. Broad Border of Fruits, Flowers and Shells (two groups of each), extending well toward the center of plates.—

"The Used Key is Always Bright."

"Many a Little Makes a Mickle."

"The Eye of the Master Does More Work Than Both His



"United States Hotel," Philadelphia.

Hands." (On back, "Hill & Henderson, importers, New Orleans").

FRANKLIN'S MAXIMS.

—Designs printed in Green, Black, etc., on circular or octagonal Plates, Mugs, etc. Border generally in relief.—

"The Way to Wealth, or Dr. Franklin's 'Poor Richard,' illustrated."

"If You Would Know the Value of Money Try to Borrow Some."

"When the Well is Dry They Know the Worth of Water."

"The Way to Wealth, or Dr. Franklin's 'Poor Richard' Illustrated."

"Not to Oversee Workmen is to Leave Them Your Purse Open"



"Arms of Georgia." Dark Blue Platter by T. Mayer.

"If You Would Have a Faithful Servant, and One that You Would Like, Serve Yourself."

"What maintains one vice would bring up two children."

"It is easier to suppress the first desire than to gratify all that follow."

"Keep thy shop and thy shop will keep thee."

"If you would have your business done, go; if not, send." (Border, inscription in raised white letters, "Fear God; Honour Your Parents.")

Same Maxims (Border, relief designs of animals, in white.)

"Now I have a sheep and a cow everybody bids me good morning."

"Rather go to bed supperless than rise in debt."



"New York from Brooklyn Heights," (by W. G. Wall, Esq.) Dark Blue Plate by A. Stevenson.

"The eye of the master will do more work than both his hands."

"Little strokes fell great oaks."

"Lost time is never found again."

FRANKLIN'S PROVERBS.

—Designs Printed in Black and rudely painted in colors by

hand. Border, Embossed Alphabet in White. Designs by J. & G. Meakin, Hanley, England.

"Now I have a sheep and a cow everybody bids me good morrow."

"He that by the plough would thrive, himself must either hold or drive."

"Make hay while the sun shines." Border, embossed leaves and scrolls, in white.

FRANKLIN INDUSTRIES.

View of men reaping and plowing. Found on sugar bowls, etc., in mulberry, etc.

MODERN REPRODUCTIONS OF FRANKLIN'S MAXIMS AND PROVERBS.

Some of the Staffordshire manufacturers are still producing cheap imitations of the earlier Maxim and Proverb plates. These usually occur with raised alphabet borders, the central prints being in green, brown or black. Among these are the following:

"Sloth like rust consumes faster than labor wears; while the used key is always bright. God helps them that help themselves; lost time is never found again."

"Employ time well if thou meanest to gain leisure. One to-day is worth two to-morrows. Since thou art not sure of a minute throw not away an hour."

"He that hath a trade hath an estate. At the workingman's house hunger looks in, but dare not enter. Industry pays debts while despair increaseth them."

"Want of care does no more damage than want of knowledge."



Dr. Syntax Platter, "The Advertisement for a wife," by Clews.

For want of a nail the shoe was lost and for want of a shoe the horse was lost.

A BUSINESS PROPOSITION.

WE ARE VERY LIKELY to get out of advertising just what we put into it, quoths Art in Advertising. A steady, determined and earnest effort will be repaid in turn by a gradual but steady increase of business.

Advertising follows the same law that governs all business enterprises—the law of seed time and harvest. The advertiser who is disappointed because his store is not crowded with customers or his mail burdened by letters as a result of his first efforts is unreasonable. There is no legerdmain about advertising. It is a business proposition, and must be pursued by the same diligent and persevering methods which are applied to all successful business operations. There is preliminary work to be done, for it cannot be expected that people are simply waiting your call. Few of them even know that you are living, and it is going to take some time to acquaint any considerable number of them with the advantages you can offer. They must be familiarized with your goods, or your establishment, or your name, or all three, before they begin to think of buying, and, after they become familiar with these in print, they may become acquainted with the goods in fact. But it all takes time and requires the exercise of patience, and patience is one of the leading characteristics of all successful advertisers. If a plan is properly formulated and carried out, there is no business operation which is as sure to bring as speedy and abundant results.

Written for the CLAY-WORKER.

NATIONAL QUARANTINE.

THE GULF STATES are again threatened with a yellow fever epidemic. Experience has demonstrated some facts that should cause our federal government to take some steps to prevent, if possible, a repetition of this scourge. We have learned that our South Atlantic and Gulf port cities are not guarded as they should be against this yellow invader; also, that the State, city and shotgun quarantine will not prevent its spread into other towns and into the interior of the adjoining States. All of these have been thoroughly tested, and even the co-operation of the federal government does not confine this disease to any one locality. There must be absolute harmony between the several powers to enable them to be effective against this dread destroyer. Absolute harmony and intelligent co-operation is practically impossible. A State quarantine is only effective within its own boundaries. There must be some power that can map out its work or plan of campaign regardless of State lines, and this can be done only by the federal government.

Prevention is better than cure. The United States government should undertake to prevent this plague from gaining a foothold on our shores. This is practicable. General Butler demonstrated this when he was in command at New Orleans during the war of the Rebellion by placing a competent physician at the mouth of the Mississippi river. He prevented the fever entering the port of New Orleans, and by strict sanitary regulations he kept the city in a healthy condition. I believe yellow fever can be kept out of the country. But should there develop a case in any of our cities, let the officers in charge see that it is discovered without delay and the patient isolated. The trouble with this epidemic a year ago was caused by letting the fever run along a month at Ocean Springs, Miss., before its presence was discovered. The germs had been carried to a number of other cities a hundred miles and more distant from the infected city. The whole country should be interested in this matter. If the fever had started as it did sixty days sooner, it would probably have spread over the greater part of the Southern and some of the Northern States. Late in the season as it was, notwithstanding the mighty efforts put forth to stay the pestilence, it existed in six States, traveling as far north as Louisville, Ky. Wherever the dread scourge was known to exist, citizens fled in terror from its presence. Business in many cities was paralyzed, and in many others seriously crippled. The actual loss to the business interests will aggregate millions of dollars. Some cities quarantined against infected cities only, some against the world, while in one town in Mississippi a gentleman writes they have quarantined there against the world, flesh and the devil.

It is high time our National Congress should take action in reference to this matter, and I have no doubt that such a measure would be supported by members from every part of our country; and I trust every member of our National Association will give it their hearty support.

R. B. MORRISON.

THE CERAMIC DEPARTMENT OF THE OHIO STATE UNIVERSITY.

Activity has begun in earnest at the school for clayworkers. Everything is stir and bustle. The laboratories have been thoroughly renovated, and now look as bright and cheerful as they have never looked before. All the apparatus has been dealt out to the students, and work will commence immediately. The outlook for a successful school year is very promising, the men of the second year's class being especially enthusiastic in regard to their work.

The department suffers a loss in the departure of Mr. Hughes,

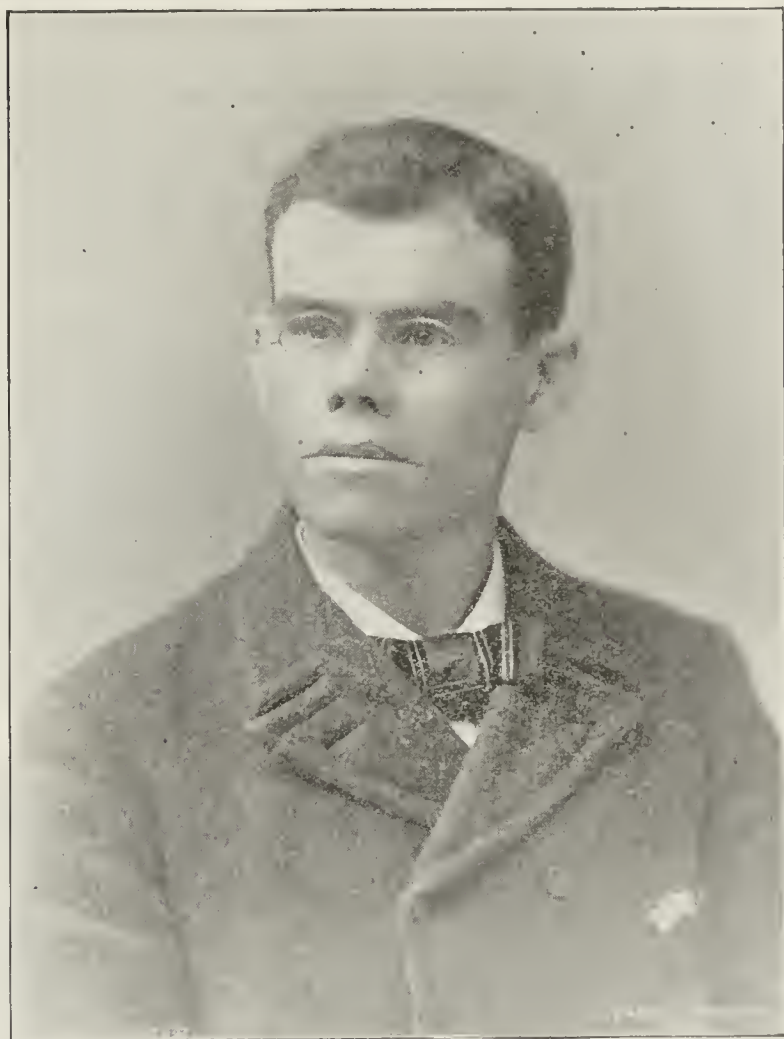
the assistant director, who has received a call to the professorship of chemistry at Oxford College. In his place Mr. A. V. Bleining has been appointed assistant.

Mr. Purdy, the holder of the N. B. M. A. scholarship, is busily at work preparing for this year's research, and the members of the association may rest assured that the work is in good hands.

FROM BRICKYARD TO BAR.

OUR FRIEND and contributor, Brian J. Dunn, whose name is familiar to the readers of the Clay-Worker, was admitted to the practice of law in the State of Maine last September. His office will be in Bangor, where we are sure his talents will win speedy recognition.

Mr. Dunn is a self-made, self-educated man. His kindergarten was a brickyard. His primary and intermediate education grew largely out of that experience. His college the world. During his early years he was foreman and afterwards manager of a brickyard. Later he was, by turn, reporter, city ed-



BRIAN J. DUNN, Bangor, Maine.

itor, night editor and general hustler for the Bangor Daily News. Thence to the Worcester Telegram, to the Elizabeth, N. J., Herald, to the Metropolitan Magazine. Then he was private secretary to Mayor Gleason, of Long Island City. During all this time his eye was on one mark—the study of law. The work in the brickyards, the editorial and business experience were a part of the journey to the calling in which he has now established himself. In recent years Mr. Dunn has contributed valuable matter to our journal. He wrote a historical review of the clay industries for the State Labor Commission of Maine. At one time he addressed the N. B. M. A. It is out of experience, grit and ambition such as this that strong men are born. To our mind there is no gainsaying the ultimate outcome of Mr. Dunn's work. We not only congratulate him on reaching the goal of his ambition, but we congratulate the community in which he lives and labors.

Fate may have dealt you a poor hand; yet, after all, a good deal depends on how you play your cards.—[Exchange.

Written for the CLAY-WORKER.

BALTIMORE BRICKYARDS.



HE ABOVE CITY is noted for its lovely women, charming men, and that toothsome morsel indulged in socially, the hard, soft-shell and devilled crabs. But as an adjunct to this and an agent for beautifying and making more comfortable homes, this first city of the South is surrounded by many large brickyards and plants.

As the Clay-Worker's representative entered its environs while yet aurora was young and the baby cloudlets yet lingered over the face of the virgin morn, the soft gray mist arising from the near-by waters seemed to beckon a silent but welcome greeting, and a shrill voice rang out: "Fresh Baltimore crabs, hard and soft-shell and devilled crabs." Leaning out of the car window to catch by ear the musical rythm of that Southern crescendo, I soon realized that I was then in the midst of a clayworking fraternity. The next stopping place was Biddle-street Depot, and here I alighted and walked back down the track for about half a mile, only to find myself hemmed in on every side by huge palisades or boardings some fourteen or sixteen feet high, designed for the express purpose of keeping people like myself from trespassing on the railroad properties. Knowing the lay-out of yards generally, I concluded that if I could scale that fence I would be sure of finding a handy brick pile or stack on the other side. I made the attempt and landed camera and owner safe, by a series of sectional movements, right in the yard, thus saving a long tramp back. This proved to be the

— Plant of Jacob Kline & Son,—

And once in the office, Senior Kline gave me, as the Clay-Worker's representative, a very hearty welcome, and an invitation to inspect the plant.

The yard, covering about twelve acres, has been worked by Mr. Kline for about fifteen years, and, I am told, was worked fifteen years before that. Any way, the lay-out was good. With a fifty-horse-power Post & Hunt Baltimore engine and a sixty-horse-power upright boiler, they are able to run their machines with fifty-pound steam pressure, hauling the clay



Loading up. Baltimore Brick and Terra Cotta Co.

from the bank on the belt, thence to the crusher, making the disintegrator do the work for the Potts machine.

All this is pro forma, but wait. Turning to the left or south, I walked down towards the two twelve-arch and one eight-arch kilns, and here was a brick suicide.

The last burning was being taken out. The setting was twelve courses, forty-two high, with the woeful result that scarcely two were burned alike. Here were nearly 300,000 bricks, and the only good portion was found in the middle

courses and above arches. All the rest, when exposed, became sandy and granulated. Without ring and minus color, not hard enough to keep nor soft enough to reburn, this 275,000 brick lay, like the fleet of the vanquished Cervera, a mass of conglomerated something that might have been.

In company with the yard boss we walked over to the clay bank, and, I guess, the seat of the trouble; but that will be for Professor Orton to say. The clay had been taken from the excavations made by the railroad and thrown up in steep banks,



Jacob Kline and Son Albert Discussing their Troubles.

and exposed to the atmospheric changes for two or three years. In the original cuts, an inspection proved a top of good loam of about six inches, bedded by a coarse-grained reddish marly clay, followed by a heavy stratum of whitish, with huge seams of heavy, stony, semi-vitreous clays, which proved a holy terror when it came to the pugger. Herein seems to lie the seat of their trouble. One day they would make a good haul of blue clay and the next loam. This would be put through the machine, and, when finely "battered," would be allowed to remain four or five days, with a constant process of wetting down; but neither the machine or hand gangs are successful in setting up a brick with a good, regular color. Artificial coloring was resorted to in the shape of oxide of iron, but this fails to remedy the evil since the coloring matter easily precipitates, and thus gives a fluid devoid of strength to mix in the clays. The brick, if burned to a cherry heat, simply turned black when exposed to the air. A medium burning, with the introduction of the coloring matter after leaving the crusher, produces the result of a chocolate brown external coating, which, when broken, discloses a creamish interior.

Thus it will be seen that the Klines have a peck of trouble, and the only thing to be advised was for them to send both samples of clays and burnings to Professor Orton and await his valuable analysis and conclusion.

With a season lasting from April to October, they have hitherto turned out from 6,000,000 to 7,000,000, and Baltimore speaks highly of their delivery.

Chiefly colored help is used, since Baltimore furnishes the same cheap and good. One hundred and twenty hands claim wages every two weeks. This includes eight hand gangs, for Baltimoreans dearly love a hand-made brick. This is explained by the fact that when the Maryland Brick Company started up some twenty years ago, the dry process was adopted, with the result that when the frost attacked them, fronts were disfigured by the wholesale. Baltimoreans became so prejudiced as to declare against it.

The city has, unfortunately, been running ahead of itself.

Large speculative operations have been indulged in, with a result that over 8,000 houses are standing idle in one section alone, and the owners are ready to rent at any figure to save the taxes. Market price of

Repress stretchers	\$12.00 to \$15.00
Salmon and hard mixed	5.25 to 5.50
Arch, dark	5.50
Red	6.50

With a dollar added for delivery.

Mr. Albert Kline, the son, associated with his father and watching the outside interests of the business, was formerly secretary of the Brickmakers' Exchange in Baltimore. That institution is now in the last stages of consumption, having recently had a big dinner to bury the surplus funds and wind up its affairs.

—Smith & Schwartz's Plant—A Yard Without Machines.—

Lying well under cover of the banks of the Luzerne and Madison railroad I found the above yard, trim and busy, the



Smith & Schwartz's Yard.

"coons" working along in good gait, although the glass stood 98 degrees in the shade, and I was boiling, and my camera was baking.

Covering twenty-eight acres, the topography of the yard is good, the seven tempering pits along the line, flanked by the five kilns, forming a fine picture from the railroad cars.

The yard first started at Canton in 1875. Success attending their efforts, the banks were worked until the railroad forced them to their present location, where thirty-two hand gangs are kept busy from April to November. A fifty-horse-power engine and boiler and a Murray clay-grinding machine makes up the list of machine labor, this being strictly a hand yard. The clays are red and blue, very plastic, giving little or no trouble, and turning out a brick of good color and texture. Everything about the yard showed discipline and order. The foreman, N. Kolb, seemed very jubilant over the season's prospects. Turning out 10,000,000 stretchers last year, their incoming orders for this year would raise that by 3,000,000. Four million of these would go to the penitentiary at Jessups Cut, a car barn for the Consolidated railroad takes 1,500,000, and a large operation of two and three-story houses take over 2,000,000 more, besides a lot of other work. Being a non-committal young man, and it being also his dinner time, I consented quietly to myself to push forward, and therefore bade him "Aufwiederschen," and marched on across the railroad track and up along a cemetery, where the white, glaring marble slabs seemed to lean somewhat as though tired of that burning sun. I didn't mind shirt and collar weltering, but the thought that the inside of my camera was getting hot enough to bake potatoes caused me to hasten along until I reached the friendly shelter and office of the

—Baltimore Brick and Terra Cotta Manufacturers,—

Owned by William H. Perot. Here my card introduced me to H. C. Meeker, the manager, who immediately insisted on my

being made comfortable, and so, ensconced in his office chair, which he surrendered, I learned from him that they had given up making terra cotta, shipments being expensive and competition from New York and Philadelphia being too much. They now confine themselves to bricks, Martin's machine turning out about 28,000 daily, and, working in conjunction with ten hand gangs gives them a total for the all-the-year season of 10,000,000.

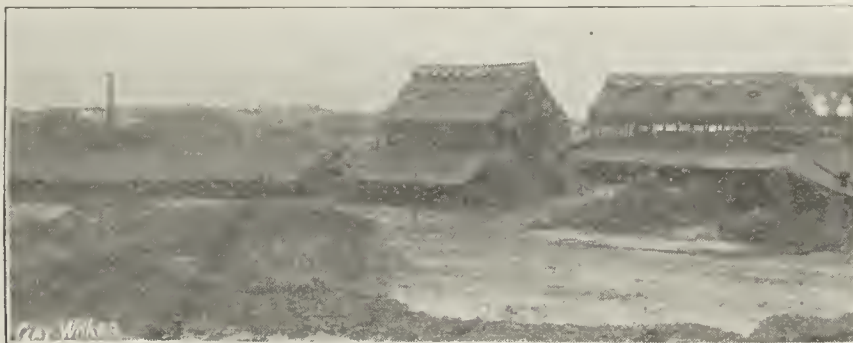
An inspection of the yard showed splendid possibilities. On the left was the sixteen-tunnel Sharer dryer, while flanking this on the south side were the six ten, twelve and fifteen-arch up-draft kilns. The clay is hauled from banks on to the belt into the disintegrator and thence to the pug mill and machine. This, with the machine houses, takes up the north side, while the six tempering pits take up the east side, giving the yard a very slick appearance.

Ten hand gangs and forty men extra make up the pay-roll. The commodity of the ground is a good pressed stretcher, sand and common hard, and these, like the yard, were clean cut and good in color.

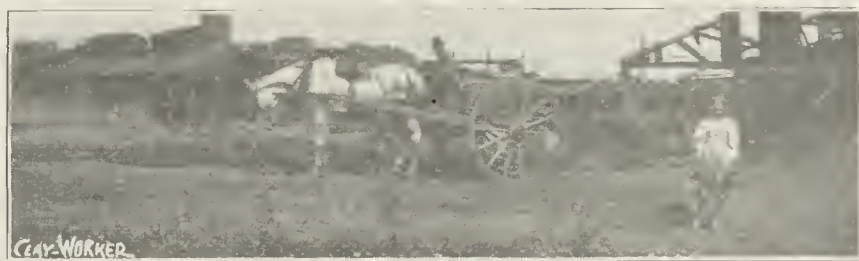
In general I learned that Baltimore awaits the throb of business revival. The overstocked condition of the market must be remedied; hence the reason of their coming into other markets. Annually she turns out about 130,000,000, while the local demand for the year may not reach 80,000,000 or 90,000,000. If Baltimore would only turn its attention to brick pavements

and roads, for certainly the condition of the streets have improved but little since 1890, Baltimore brickmakers may yet find a field for their pent-up energies and the contents of their yard.

Thanks to manager Meeker's thoughtfulness, the horse and buggy was brought around, and in proper form I drove over to the cars and into Balti



Baltimore Brick and Terra Cotta Co's Works.



In the Gloaming, at Wilmington, Del.

more for luncheon, having done my eleven hours since breakfast at 5 a. m. in Harford county. W. P. LOCKINGTON.

OBITUARY.

The Death of Mr. Theodore Fredericks.

DEATH HAS AGAIN entered the ranks of the old brick-makers by the removal of Theodore Fredericks. He did not "die in the harness," for three years ago he retired from the business after long service, which ranged from machine boy to proprietor. Through all the different grades he passed, and was always noted for strict attention to business early and late. He was known as a thorough brickmaker. His aim was always to make the best grade of brick possible with whatever grade of clay he had. Many years ago when he made brick in Mud Hole, now Roseton, his stock had a name in the New York market. At a later date in Haverstraw, with improved

machinery and the best of clay and sand, the T. F. brand of brick commanded the top price with ready sale.

Three years is a short time for a man to enjoy the fruits of a lifetime of hard work, and it was hard, too, at times in his case. To have one's little savings swept away by others connected with you in trade is trying, and such was his experience at one time.

Even for that short period he was afflicted with what at one time was supposed would result in total loss of eyesight. He was taken to a sanitarium for treatment, but had to be removed to his home on account of heart trouble, of which he died at the age of 72. Mr. Fredericks was a strict Prohibitionist, a consistent Christian, always ready to help any movement for the benefit of those in need. He leaves a widow, two daughters and one son to mourn the loss of a loving husband and father.

Ira L. Otis, Rochester, N. Y.

One of the oldest, active brick manufacturers of this city, Mr. Ira L. Otis, died at his residence, 274 Alexander Street, September 24, at the age of sixty-four years. The cause of death was heart failure.

He was actively attending to business the day before his death. Mr. Otis was born in Boston in 1835, and came to this city with his parents at an early age. He was educated in the public schools and graduated from the University of Rochester in 1855. Mr. Otis was connected with the Rochester Brick and Tile Manufacturing Co. for a period of thirty-five years, the last twenty of which was served as its president.

Mr. Otis was a republican in politics, at one time representing his ward in the Board of Aldermen. He was a member of the Hemlock Lake Commission at the time of his death. For many years he was one of the managers of the House of Refuge, now the State Industrial School. He also served one term as President of the Chamber of Commerce.

His immediate family, besides the widow, are one son and two daughters.

Hector McLean.

The brotherhood built up through the N. B. M. A., has its darker side as well as the enjoyable social and business features. It brings all together in a way which makes separations and dismemberment a cause for sorrow. We have to record the death of Mr. Hector McLean at his home in Bridgetown, Nova Scotia. He was a native of Cape Breton, was born February 14, 1843, of purely Highland Scotch stock. He graduated from the grammar schools in 1859 and studied higher mathematics and engineering during 1860 and 1861. During the next three years he spent most of his life at sea, and obtained a master mariner's certificate in Liverpool, England. Following the period of his sea life he engaged in practical engineering and for some years was engaged in railroad construction in the United Kingdom. In 1878 he returned to America as a member of the firm Parker & McLean and had charge of building and operating 1,350 miles of railroad in the States of Maryland, North Carolina and Ohio. In 1889, owing to injuries received in an accident, he gave up railroading and settled down to quieter life and was engaged in various enterprises as an investor and manager. Among others was his work as director and manager of the International Brick and Tile Co. of Bridgetown, N. S. He was deeply interested in the clay-working industry, its literature, and in the meetings of the N. B. M. A. In a letter his wife says that these meetings were a bright spot in his life and while he had unavoidably been prevented from attending the last convention, he had determined not to miss another. Mrs. McLean further says: "When the last number of the Clay-Worker came before his death, though he had been ill for several weeks, he seemed to be getting better and could read considerably. On one occasion he

said, 'Come here and sit beside me, I want to read you something good,' and I knew by the tone of his voice that he was deeply moved. When he had finished he said, 'What a glorious fellow that Gates is. We know something of what it all means, don't we, old girl?' He had read Mr. Gates' Button Hole Talk in the June number."

The death of Mr. McLean was a great loss to the community in which he lived. He is spoken of in the highest terms by the local press, both as to his relation to the church and municipal affairs. He combined strength with kindness, intense energy of purpose and execution with courtesy, and tender regard for the rights and feelings of others. One has said of him, "His heart is as large as the world, but there was no room in it for the remembrance of wrong."

AN IMPROVED SEWER PIPE PRESS.

Also a New Jolly of Remarkable Capacity.

TAPLIN, RICE & CO., Akron, Ohio, well-known manufacturers of pottery and sewer pipe machinery, have a new steel frame press, a view of which is shown on page 325, which they think is superior to any press heretofore introduced to the trade. Taplin, Rice & Co. are pioneers in this branch of clay machinery, their presses are installed in many of the largest pipe plants in America and have an established record for great capacity. Their latest machine is

—An Improved Jolly—

Of wonderful capacity. It is a machine which is destined to revolutionize the pottery business. With it an unskilled workman can readily turn out jars of any desired size up to 100 gallons at many times the speed of a hand turner, and make really a better jar. The eighty-gallon jars, illustrated on page 216 of the September issue of the Clay-Worker, are being made at the Monmouth Pottery on one of these machines. The machine not only turns out a much larger quantity of ware than can be made by hand, but it makes superior ware, ware that can be handled, dried and burned the same as hand made ware and with considerable less loss. When to this advantage is added that of dispensing with the plaster molds—no mean consideration—its importance to potters may be readily seen.

The machine, which is the most original in movement ever introduced to the clay trade, will be illustrated in the next issue of the Clay-Worker.

GERMAN VS. AMERICAN METHODS.

Mr. Emil Fernholtz, of the Fernholtz Brick Press Co., St. Louis, has returned from a three months' trip to Germany. He visited his old home, but had no desire to locate there permanently. St. Louis will continue to be his choice as a place of permanent residence. Mr. Fernholtz traveled over a large portion of Germany, visiting many of the principal cities and, of course, gave particular attention to the brick industry, which he says is generally in a prosperous condition. The brick business there is more stable than here, the manufacturers being content to do a moderate business and never try to extend or increase their business by cutting prices, which so frequently causes demoralization here. There the prices of brick fluctuate but little, averaging between five and six dollars the year through, notwithstanding labor is cheaper there. Fuel is a trifle more expensive, but the manufacturer gets a better return for his investment than do most Americans. Their common brick are not as good as ours, but they answer every purpose and so are good enough. Mr. Fernholtz remarked that the German manufacturers seemed on good terms with one another, trade rivalry being less fierce. Perhaps our manufacturers might profit largely by acting on this hint and work together instead of against one another as is so often done. A policy of "live and let live" would result advantageously to all.

THE SEASON IN MAINE.



THE BRICKMAKING SEASON in Maine is drawing to a close. All things considered, it was the best season for the manufacturers in many years. Perhaps it looks better in the retrospect, from the fact that it promised nothing in the spring and broke its promise. The weather throughout was the most favorable to brickmaking experienced for a decade at least. The days were days of drying, though the nights might weep their hearts out. The old-timer who prayed that the Lord might send the rain only nights and Sundays, that his crews might fill with profit every moment of the time spent in his employ, would have found his prayer answered had he lived. Through all the depression of business still lingering from the collapse of 1893, and through the stagnating influence of the war fever, hopeful ones were building and are building still, and the demand has been for in advance of the expectations of the most sanguine brickmaker. (But did anybody ever discover a brickmaker who was sanguine over the market prospects?) Prices have averaged \$5.75 net for up and down lots throughout the State. Nearly all of the mud yards have been running with half crews and many of them were obliged to shut down several weeks earlier than was planned, on account of lack of kiln room. The excellent weather had much to do with this.

Mason & James's brickyard in Lubec (the easternmost point of Uncle Sam's mainland), nearby the disappointing plant of the sea-water gold schemers, has enjoyed a very successful season, and its bricks have commanded the best price paid for common lots in Maine. The output has been about half a million, more than half of which has been sold. The principal demand was from the several Lubec villages, where building boomed until the bottom fell out of the gold scheme several weeks ago. There is still, however, a good demand from the thriving city of Eastport, located a few miles across the bay. Eastport has a population of 5,000, compactly settled, and all with a strong liking for brick as a building material, acquired in several bitter experiences with fire in the past forty years. It is a manufacturing city, with scarcely an idle man, woman or child. When the land fails of employment for the people the sea supplies it. Cod fish swim in schools within a rod of the shore, and any man may earn from \$1.50 to \$5 a day with hook and line. Eastport is building and bound to build, and its nearest brickyard is that at Lubec. There are many fine brick structures in town, and a big hotel at Shackelford's head, and other large buildings are promised for next season to gladden the hearts of the brickmakers.

The Columbia Falls brick plant, it is hoped, will be running again before many months. It is the finest brick manufactory in Maine.

Hosea B. Phillips' yards at Ellsworth, Hancock county, have turned out nearly a million bricks. Half the output will go into business blocks in the main street of the city, at profitable prices; the remainder will find ready sale in Bar Harbor and Rockland. Phillips uses Hobbs machines, and the bricks are of excellent quality.

George Patten's yard at Sullivan, across from Mt. Desert Island (Bar Harbor), has turned out about 900,000, all of which will go into buildings in the summer resorts along the bay.

Three yards in Orland and three yards in Penobscot (Hancock county) employed about four men each for four and a half months, and manufactured about 800,000 each.

A. W. & A. B. Hutchins, the pioneer brick manufacturers of Orland, are burning their last two kilns of 250,000 each. The market for Orland and Penobscot is chiefly Boston, with a demand from summer resorts along shore and the city of Rockland. Prices have ranged low, and competition is sharp. Brickmakers in that vicinity are discouraged. For the first time in the history of brickmaking in Orland the manufacturers suspended operations in their yards while the crews went haying. Some say that they would have suspended entirely had they not wood on hand that had to be burned to be saved. And now they say it was like a bad man's wind-up—burned and lost.

In Bangor Walter J. Hellier has burned 1,500,000 sand-struck bricks, and the demand continues brisk at about \$5.25 per thousand, up and down lots.

In Brewer (which is practically a Bangor suburb), Samuel A. Holyoke is burning twenty-six arcues, containing about 550,000. One other kiln burned by him contained 225,000, both kilns

constituting the product of four men's work during the months of May, June, July and August.

Aaron H. Gould has burned a kiln of 500,000 and one of 225,000, making 725,000 manufactured since May 10 by four men. John Flannigan and James O'Toole made the bricks and set them in the kiln upon contract, receiving therefor \$1.75 per thousand. They will be well paid for their season's work.

Hugh O'Brien's plant in Brewer, operating two Martin sand machines, is still in operation. The output will be between 1,500,000 and 2,000,000. The market for Brewer bricks is Bangor and along the lines of railroads north to Aroostook county and the boundary, and south along the Penobscot river shore towns. There have been some shipments to Rockland. The outlook is encouraging, but nearly every Brewer kiln ground is full. A reminder of Brewer's departed glory, and a tribute to work well done, came to Mr S. A. Holyoke recently in a letter from a firm in Boston, which said: "Twenty years ago we purchased bricks of you, and found them satisfactory. We are now about to erect a building, and we offer you a price a little in advance of the regular price quoted here." Mr Holyoke filled the order, but the result only emphasized the fact that Boston, once the chief market for the Penobscot river bricks, is moving farther and farther out of reach. Competition, the life of trade, is a killer of industries, too.

Brewer brickmakers feel the need of newer methods and improved machinery, in order to successfully compete in the great markets, but in the face of the thousands of inventions and expensive schemes for turning mud into brick they stand irresolute and fall back again and again to the old mud process or its younger brother, the sand machine. They need a Moses, and they know it, but they will doubt their Moses, if he ever appears, until he has landed them safely through the wilderness. By that time, if Moses is a modern business man, he will monopolize the industry, and his followers can look at his sneers from the near terminus of the tangle in which they struggle.

Kennebec river yards have done about half a season's work. The Gardiner yard was not operated this year. About 200,000 of last year's crop remain upon the kiln ground. Bricks from Sheepscot river way and from Augusta come into Gardiner as cheap as they can be manufactured in Gardiner. Augusta, with a population of 10,500, has manufactured about 1,500,000. These must be used within a radius of twelve miles. The demand so far has been light and prices low. J. E. Fuller's yard, Martin Higgins manager, put the season's output into one kiln of 850,000, which is burnt and ready for market. Horace Purinton is still striking at the Hicks yard, and will finish up with about 800,000 from his crew of six. Nearly all of Purinton's bricks from his Augusta, Winslow and Fairfield yards are used by the proprietor in his building contracts. Winslow and Fairfield yards (about twenty miles north of Augusta) will have made about 2,000,000. The demand for these in Waterville has been fair, and prices have averaged \$5.50 per thousand. Purinton's Fairfield plant is run by electric power, the only one of its kind hereabouts. Purinton's bricks are made and set by contract at \$1.75 per thousand. The plan seems to work very satisfactorily wherever it is tried.

The most northerly brickyard in Maine, and the only one in operation in Aroostook county, is run by Dan Mullen, in Ashland, at the terminus of the Bangor & Aroostook railroad. The yard was opened in June, and one kiln of 100,000 has been burned. They sold readily at \$8 per thousand right through. The last kiln will contain about 100,000 when completed. Aroostook county is greater in area than the State of Massachusetts, and it would seem, therefore, that Mr. Mullen's venture might prove profitable, even though the bears in his vicinity persist in pulling off the glass insulators from the telegraph poles, mistaking them for a new species of fruit. The brickyard is safe from the bears, though. Nothing but the lord of creation ever mistook a brickyard for a peach orchard or a paradise of any kind.

Wages of men in Maine this year have averaged \$30 a month and board for wood-yard hands. Good kiln wood is bought for from \$2.50 to \$3 a cord. The cost of bricks burned in many yards has not exceeded \$4 per thousand; and does this mean a profit? Well unless the Maine brickmaker has undergone a metamorphosis recently, it means that many builders will be buying good bricks next spring for about \$3.75 per thousand. But, then, there is a limit to all folly, and may be the Maine brickmaker will discover that if he maintains a margin of profit on his goods he can sell just as many and afford to make a little better article, and eventually sell more and more at a little more and more. Any way he should not be discouraged, for Maine is going to build as she never builded before, and the coming spring will see it well begun.

B. J. DUNN.



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Busy Times for the Brickmakers of Cleveland.

Dear Randall:

The long-promised good times have come at last; prosperity is here, and the builders and brickmakers of Cleveland are having all they can do to fill the demands for material. Never in its history has the city of Cleveland consumed in one season so many brick as this year, consequently prices are very good. All the yards in this city and within fifty miles, Canton included, are running full force, and no stock on hand; all sheds and kilns are empty. We are burning small kilns, and haul brick so hot that the wagon boxes catch fire, and it is so with every brickyard that I know of here and in the neighboring towns. Prices are from \$1.25 to \$1.50 per M higher than last year. There is now a local organization here. Building brick are selling for \$5.25, sewer brick for \$5.50, and shale sewer brick from Canton and other places at \$6 to \$6.50 on cars. Here the consumption is four times larger than last year, and the outlook for next season is immense. The yards are working ten hours a day. I have not lost one day all summer, and my men worked Labor day and made brick for a full day's work. Every yard is being worked up to its full capacity.

—Like Brick Streets.—

There are more streets paved with brick than with any other material in this city, and there has been three times more paving brick used this year than last, and the outlook for next season is greater than this. The city of Cleveland is doing more improvement, such as sewers and street paving, this and next year than has been done in the last twenty years. The factories, foundries and shops are running full time and sometimes over-time in this city and vicinity.

Glorious, good, golden times. Everybody is busy and no complaining.

I trust our next convention will be held in Columbus, Ohio, and hope that the good times have struck the Clay-Worker also, with best wishes, yours sincerely,

Cleveland, Sept. 27, 1898.

F. H. EGGERS.

Pavement Guarantees—A Contractor's Views.

Editor Clay-Worker:

I have been reading with a great deal of interest the articles which have appeared in the late issues of the Clay-Worker relating to brick pavements. Your efforts in behalf of the paving brick interests are well directed and will bear good fruit. The article in the August number entitled, "Do Paving Brick Receive Fair Treatment from the Engineers?" leads me to write on a like subject, and ask if Paving Brick Contractors Receive Fair Treatment? The one thing I object to most is the long-term guarantees that most city engineers now stipulate. I do not believe it is a fair practice considering that the contractor is compelled to lay pavement according to specifications prepared by the engineers and of material subject to their inspection and approval. Particularly is this true of brick pavements, for if an engineer knows his business he can tell as soon as the brick are delivered and before they are laid whether they are

good brick, and whether they are suitable for the service intended. This is not the case with asphalt, it is true. No one knows what asphalt will do or how it will wear till it is down and in use.

I do not think an asphalt man, even, can more than guess as to the wearing quality of a pavement he is putting down. If his material is all right and he gets it mixed all right and it is put down just right, being neither too cold nor too hot when it reaches the spot and is spread down, it may prove to be a good pavement. There being so much uncertainty about asphalt, maybe it is fair for engineers to require a guarantee, a reasonable guarantee from the asphalt company. But this does not apply to brick at all. Any engineer ought to be able to tell whether a lot of pavers are what they should be and if they are not he should reject them. If they are good, and acceptable, then the city inspector should see that they are laid right and having laid them right the contractor has filled his contract and should be released from further responsibility. I believe the guarantees that are now required are unfair and am not sure that they can be enforced legally. It's a question in my mind whether a contractor can be compelled to keep an ordinary contract as they are now made, for several reasons.

First. The specifications are prepared in the engineer's office and the contractor is obliged to lay the pavement just as the engineer directs.

Second. The material has to be inspected and approved by the engineer, every feature of the work is subject to his approval from foundation to finish. Now, after all this work with material specified by the engineer, laid according to his specifications, every stage of the work subject to close inspection and approval, is a long guarantee necessary, is it reasonable? I think not, and I believe if a test case was taken to court, it would fail, for the reason that the contractor is required to guarantee the results of specifications for which he is in no wise responsible, having had nothing to do with preparing them, and having carried them out under the direction of and subject to the approval of the engineer.

For comparison, say an architect in his specifications for a building should provide for a nine-inch wall four stories high and require the contractor to guarantee it—say this architect so specifying it should examine it as it went up and finally order payment for it, would the contractor be responsible if it failed and tumbled down? Any court in the land would say that the architect was responsible. If an engineer should specify the size and manner of constructing a brick pier would he be justified in requiring a guarantee from the contractor that that pier should carry twenty-four tons per square foot? Would he be justified in requiring damages from the contractor in event of failure? I think that no legal authority would hold the contractor responsible. In other words, should a contractor be required to make up the deficiency for faulty engineering? Should he be required to guarantee a specification for a one year pavement for five years? Should he be required to guarantee a five year specification for ten? Isn't this guarantee business so far as it relates to brick pavements badly overdone? It seems so to—

A CONTRACTOR.

New Haven News.

Editor Clay-Worker:

The brick business in this district is not as active as it might be. In volume it is considerably less than it was a year ago. There has been comparatively little building in New England this summer, because of the war scare chiefly, I guess. There were a great many plans ready at the time the war broke out, but they were laid aside and have not been touched since. May be building will begin again, now that the war is over, but not much of a boom is looked for before spring. We do look for decided improvement then.

The various brickyards in this section have been running

most of the time. The Merwin plant at Berlin, the largest brick establishment hereabouts, has accumulated nearly ten million brick. W. L. Davis has his sheds full and some piled out. Tuttle Bros. have not made brick since the middle of August. The Berlin Brick Co. has about five million. The Donnelly Brick Co. quit making Sept. 1, with about the same quantity in stock. Richard Murray has not made any brick since the middle of August. He stopped then with his sheds all filled. From this it will be seen that the condition here is not very satisfactory. Last year at this time the sheds were fairly well cleared.

Now at the present time there is a great deal of work talked of in Hartford, New Haven, Waterbury, Providence and New London, and all along through this locality, and all can be reached very handy from this place by rail. All those buildings which were going up are of the better class, and will require a large amount of terra cotta.

The Donnelly terra cotta plant, the only one there is north-east of New York, is offered for sale. The works are situated in Connecticut, a very central location for this business. As there is a very large amount of terra cotta used in the buildings that are going up now, this is a good chance for some experienced party to build up a large business, as the location cannot be beat. They have plenty of good clay and all the necessary buildings, appliances, etc., but they are brickmakers, not terra cotta.

A YANK.

New Britain, Conn., 10-1'98.

Making Brick From Faraway India—After the Mud-Pie Style.

Editor Clay-Worker:

Though India is one of the most ancient of nations, yet her people seem to be still in their childhood. As an evidence of this I would give you their prevalent way of making bricks. After considerable difficulty the following information was obtained on the ground. (The makers had fear that I would introduce some new method by which the old might be supplanted and our native Christians boycott them generally.)

Red earth sediment is generally used, found along the banks of streams or deposited in backwater eddies. Such soil is conveyed, per cart or on men's heads, to brickyards quite near the homes of the makers. And a poor brickyard it is! Anything but a smooth place, generally wedged into the private yards of their little wretched houses in the potter's ward. This class or occupation constitutes a distinct caste, having its own peculiar custom, and in many senses its own religion.

The clay deposit has to be first pulverized by a slow bamboo cudgel process, and then made into mud by a vigorous treading of the feet. A strange kind of "sea-sawing" as they call it is used. One-fifth of the mud consists of ashes, horse dung and a very fine sediment of clay. This very unique and costly ingredient is added I am told to prevent bricks from cracking while drying in a torrid sun, also to cause proper hardness while burning.

We have now come to the moulding. The mould used is a four-sided arrangement, open at top and bottom and always single. Placing it on the ground its sides are well lubricated with a wet rag, then handful by handful the mud is filled and packed in with as much deliberation and care as though it were the first and last brick ever made. With equal sobriety and motherly touch the hand, now appearing something like a beaver's tail, passes over the top again and again, the wet rag again being used in the meantime to cause as smooth and shining surface as possible. Then after you have sufficient time to take in all the wonderful process, up goes the mould, slowly and more slowly, 'til at last, with a triumphant flourish of red-turbaned head and dark bony hands, a not unpleasant-looking form burst upon your view. About the same nature of honest innate pride fills the breast of this poor child of nature as when, the reader, you and I, in our lowly innocence, made our first mud pies. But our chief artisan, after crawfishing a little here and there, is actually ready for another such development. Under favorable circumstances—when the mind is not diverted by a caste wedding, or in tears and sobs a dear friend has not to be escorted outside of the ward on a long, hazardous journey of ten long miles—three men can leave behind a bright array of 200 such bricks. As such occupation is considered

very trying and skilful, these men, working eleven hours, must be paid unusually high wages, ten cents per day.

After three days the bricks are turned and after eight more are ready for the kiln.

The burning process I think is well worthy the consideration of those even who are accustomed to natural gas and a more ornamental and efficient kiln. The Indian brick kiln is arranged in reference to economy in fuel, a matter of great concern in a land so destitute of timber. A spot sloping towards the breezy side is selected, and on this a rude wall about two feet high, inclosing a space of something like 15x10 feet is built. Towards the lower or breezy end, two very small doors of about one foot square are made. On the bottom of the kiln about a 6-inch layer of good wood is placed throughout; over this a thin layer of inflammable material, such as straw, leaves and trash generally, then over this a layer of bricks, and so on alternately bricks and such rubbish, ending in an oblong dome-like mound, of say, 8 feet high. Over all is packed about one foot of earth, and after the outer part is watered and plastered over with mud, fire is applied at the small doors. When the inside fuel near the door is well ignited, all the doors are tightly closed. Then for one week the whole is allowed to smoulder after the style of burning charcoal. After 15 days the bricks are removed in a red state—the red ones considered the best. They are about as hard as the ordinarily red burnt bricks at home, but make very serviceable rain-proof walls.

The dimensions are generally as follows: 12x6x2½ and 9x4½ x2 and 10x5x2. The respective prices are about \$4, \$2 and \$1.75 per thousand. Sun-dried bricks are the bricks for the masses of India. The best material for such is called "white earth," a well-pulverized earth resembling ashes. In and quite near the thousands of Indian towns regular mines, as it were, are found. The origin of such earth, as is supposed, is well decomposed garbage. Hundreds of years ago carts were rarely found, and as a consequence town garbage was not conveniently conveyed as enrichment to the fields, but thrown together in some convenient place near by. Such ashy looking and rich formation make a brick that is about rain and whitewash proof. Mortar of such earth is very extensively used in erecting large stone and brick buildings. Sun-dried bricks of such earth are generally about 12x10x4 and cost something like \$2 per thousand. It is a very common thing to see high town walls made of such bricks.

During the late famine I used pretty successfully dried cactus or "prickly pear" as fuel for burning bricks in our relief work.

L. B. T., Kolhapur, India.

The Situation in Chicago.

Editor Clay-Worker:

The brick situation in Chicago is about the same as last month. Considerable building is going on for this time of year and the architects still have considerable work on their books for this fall and winter. Everything now indicates an old-time building season for next year. During the month of September 372 building permits were taken out, at an aggregate cost of \$1,375,950, which looks pretty well for this time of year. The largest part of this is apartment buildings.

The system of big intercepting sewers is making a large extra demand for common brick, the largest of the sewers being twenty feet in diameter. The pressed brick men are doing considerable hustling.

Chicago seems to be finally waking up to the paving brick question, in which she has been far behind her smaller neighbors, perhaps on the principle that large bodies move slowly. At any rate, a much larger amount of brick paving than ever before has been contracted for this fall, and still more will be put in in the spring.

Fire-brick men and cement men are still far behind in their orders

TEMPLE BARR.

Chicago, 10-12-98.

CLAY CAST LIKE IRON.

A discovery which may revolutionize the pottery and porcelain industry, if successful, is reported by the Philadelphia Record. It is simply that the clay, instead of being molded wet and baked, can be fused by means of an electric furnace and cast in molds exactly like cast iron. If the mold is sufficiently smooth inside no glazing is needed, but, should any be required, powdered glass is sprinkled over the surface of the casting while it is still hot enough to fuse the glass.

Written for the CLAY-WORKER.

THE USE AND ABUSE OF CLAYWORKING MACHINERY. Fifth Paper.

BY A MASTER MECHANIC.

IN TRANSPORTING CLAY material, we have reviewed the so-called dump cars, in our last article. Namely, cars which travel on wheels upon permanent tracks. As mentioned before, there are other means however. These we will now consider in this treatise.

When a large clay deposit is quite near the factory, we will say a clay bank from twenty to a 100 feet high, to be worked upon, continuous apron carriers can be used to advantage. These are made in various ways. The simplest construction is a plain belt carrier, for a location where the incline is not over thirty-five degrees. Of course, the quality of the material modifies the incline. For dry and friable clays the incline must be less than the above mentioned angle, while soft and sticky clays can be steep as quoted. A steel or iron frame made of angle or channel iron, is always preferable to wood, for this style of carrier. It should be constructed with series of transverse shafts, no less than three feet apart. The shafts provided with a number of travelers of about six inches diameter, upon which the belt travels upward. In some of these carriers, the travelers are made somewhat smaller toward the middle of the belt, so that the material to be carried has a tendency to work toward the centre, to prevent spilling over the sides while in transit. When the frame is provided with protecting strips on the sides, which project a few inches over the belt, the travelers are all made of one diameter. In order to have this class of carriers work well, it is necessary to have large drums at the ends of the carrier frame for the belt to run over. Inasmuch as the upper drum is usually the driver, or the point on which the driving power is applied, this should be the larger of the two. Should it become necessary to drive from the lower drum, then this should be the larger, even more so, than when the upper drum is the driver. The reason for this is obvious. Inasmuch as the strain and weight is carried by the upper drum, very little tension is required, whereas if driven from below, the strain must be made excessive, hence the larger the driving surface, that much less the longitudinal strain. The drums are usually made somewhat larger in the centre ("crowning" as it is called in mechanical parlance). This insures a tendency for the belt to run more even, than when the surface of the drums are of equal diameter. At the end of the carrier, which has the non-propelling drum, the boxes for it are placed in longitudinal slides, so that, by means of long adjusting screws, the traveling belt can be made to receive the proper strain required. These endless apron carriers are used very extensively, also, inside of factories to convey clay to the different machines and are adapted to various positions. Sometimes these are used horizontally to convey the clay to such points as desired.

The plain belt is often provided with transverse slats or buckets of different shapes when the clay is fine or the incline steep. The bucket elevators for ground clay is so well known, that I need not dwell long upon this subject. However, there are many in use badly constructed, causing much delay and annoyance. Further on I may describe the well made, as well as those which can not be recommended, also the abuse these useful appendages to the clay industry receive often undeserved.

Formerly many of these clay carriers were made of chain. Generally two chains running over sprocket wheels. Between the chains slats were provided, the ends made fast to special attachments on the chains, by means of which they were carried along synchronously. Upon the slats, heavy canvass was stretched upon which the clay was carried. While this gave a positive motion, it proved not to be durable, as every joint in

the chain would wear, often more on one side than the other, so that the sprocket wheels would not pull evenly and excessive wear result. Lately, however, an improvement has been made in using only one heavy chain in the centre, having guide pieces on the underside. These fitted a smooth chain wheel at each end of the elevator frame. As these have only been in use for a year or so to my knowledge, the durability has not been fairly tested, yet the action so far seems far in advance of the sprocket wheel system.

All this class of endless apron or chain carriers need constant attention, otherwise much delay and annoyance are experienced. With soft and sticky clays this is more required than when dry material is handled. For this sticky material only smooth belts are advisable so that scrapers can be attached to the lower side to keep them clean. For erecting these apron carriers, care should be taken to have a large open space below the lower end of them. It is unavoidable to have some portion of the clay drop back and off the carrier. This accumulates, and if not frequently removed the carrier has to drag through it causing extra wear, consumption of power and frequent stoppages. Where only a small space is left it is obvious, that more frequent cleanings are required. Another mode of carrying clay is that of buckets carried either on overhead tracks or wire ropes on trolleys. The buckets are made somewhat similar to those on steam shovels, namely, with a hinged bottom that can be dropped at will. This is either done by an automatic arrangement or a trip cord. This construction is used where the clay has to be carried over gullies, water courses, or railways, where bridges are inadvisable or too expensive.

Recently other devices were illustrated and advertised in the clay journals. These I will not now criticise, but leave it to the readers to draw their own conclusions, as they were fully described by the makers.

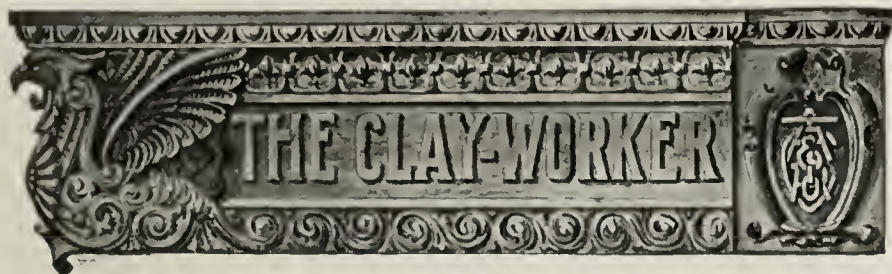
NO SWEATING—NO SWEARING.

THE LAYMAN'S attempt at technical description of machinery, while perhaps very expressive, is often amusing. A machinery concern well known to the readers of the Clay-Worker recently furnished an entire outfit for hollow brick, common and repressed building brick to Mr. Dennis Buckley, of Wilkes Barre, Pa. They had full swing, and put in boiler and engine, as well as machinery proper, shafting and belting. The local newspaper, with journalistic enterprise, sent a writer to witness the operation of "starting up." The engine and boiler were large enough, the belts sufficient, the crusher crushed, the pug mill did its part, and, in the language of the newspaper man, with "no sweating, no swearing, the thing made bricks right from the start. His description was ample for the engine and boiler, but when he reached the brick machine, his word picture was "that it resembled, more than anything else, a huge sausage machine, such as could be seen in any of our well-appointed meat stores. The clay fell into one end, where it was beaten and hammered by large paddles, and finally emerged as sanded bricks as fast as they could be taken away."

The application of "sausage stuffer" to the Chambers brick machine is by no means new. It has sometimes been heard in envious derision, and again, as in this case, through an attempt to find a familiar simile for a wonderfully automatic machine that never fails to excite admiration.

PROMISE SOMETHING GOOD.

The Battenfeld-Morgan Co., Cleveland, Ohio, advise us that while they have purchased the shops of the Central Machine Works in that city and are now well equipped to manufacture a full line of stiff clay machinery, including brick and tile machines, pug mills, clay crushers, represses, etc. They have not arranged to manufacture the "J. N. K." machine, which is still the property of Mr. J. N. Kaufholtz, the former proprietor of the shops, and may be built by him elsewhere. As stated in their ad. on page 330 they will have something new in our next issue, which they think will be of special interest to brick-makers.



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CURRENT COMMENT.

Nothing startling has occurred since our September review. Peace Commissioners are at work on the details of the adjustment of the late unpleasantness with Spain, and so far as details of progress have been given out, no very knotty questions have been wrestled with. French mind readers pretend to have "caught on" to some propositions made by Spain in the way of asking indemnities from us on account of the trouble and expense she was put to by our rudeness; and it would be just like her to make such a demand, but only those who insist that the war was badly managed from the beginning apprehend any concessions that will be inconsistent with national honor, and the American people will demand nothing dishonorable. Perhaps nothing has been more noticeable than the steady growth of the sentiment that we can spare nothing that has been acquired by the war. Many a large family of growing and grown children did not care to have their number increased by a newcomer, but when it had come, not one of them was willing to part with it on any terms. Porto Rico, The Phillipines, all of them, have come stay and soon to be petted and loved.

* * *

Even Cuba—poor scourge stricken, starving Cuba—is to be provided for, just how, nobody on earth can tell. There are indications that we may find ourselves in the predicament of the peace loving man, who interfered with a domestic disturbance by attempting to part a man and his wife who were pommeling each other—they both went at him with their bludgeons, informing him that his interference was not wanted. Unquestionably our relation to Cuba is anomalous. We have driven the Spaniards out, or will have to when they go, which is not likely to be soon, but we have no standing there. We have separated the belligerents, but we have no right to dictate the future policy of the island, and stranger things have happened

than an unpleasantness with the Cubans themselves, if not also a farewell shot from the Spaniards. But to an extent never before known, the American people are giving themselves no concern about the possibilities of the future; they seem to say they have hired Messrs. McKinley, Sampson, Miles and Company to look after that business, while they themselves look after farming, merchandising and manufacturing and the like, and never have these departments been in better shape. Railroads were never more profitably employed, money was never more abundant, nor the people more hopeful, the calamity crank has gone out of business.

* * *

An eve of prosperity is evidently before us, and no industry has a brighter immediate future than our own. Not for many years have the next summer's building arrangements been more forward at this time of the year than now. The duty of the brickmaker is plain. Whatever can be done in the winter must be done in anticipation of a good business next year. Of course every one will read the Clay-Worker carefully, taking down from the files the numbers which were hastily read or not read at all during the busy days and short nights of summer, and those who from experience know the pleasure and profit of our mid-winter conventions, will be storing up good things to tell the brethren at these yearly meetings—all the conventions, National and State, should be well attended this winter. We shall confidently expect all the old members and many new ones and a good time socially and intellectually.

PAVING BRICK IN LARGE CITIES.

This issue of the Clay-Worker contains two practical and valuable articles relating to the paving question as applied to large cities. We refer to those discussing the paving of New York and St. Louis. In such cities the paving question is a momentous one. The matter of paving is subject to two very heavy strains, one physical and the other political, and it is difficult to tell which entails the greater wear, friction and cost. Certain it is, however, that in these large cities brick has never as yet succeeded in getting in the center of the ring politically, though it has covered enough territory on the out edges to make a record. By the grace of good material and good work there can be no question as to the ultimate standing of brick in its physical and possibly political relations. In the city of New York it is said that the words "scandal" and "asphalt" are spelled with the same letters. We don't know just how it is done, but we do not question the possibilities. In many sections of this country asphalt is coming to have a bad smell. We all know that brick are odorless.

STATISTICS OF CLAYWORKING.

From the Geological Department of the United States Government we have received two documents, one the Statistics of the Clayworking Industries in the United States in 1897, by Jefferson Middleton, being an extract of the nineteenth annual report of the survey, which is under the general direction of David T. Day, chief of the Department of Mineral Resources. The other report is on the Kaolins and Fireclays of Europe and the Clayworking Industries of the United States in 1897, by Heinrich Ries, and under the direction of the same department. Mr. Middleton has to say in his introduction that at the opening of the building season of 1897, clayworkers were encouraged to believe that the year would be one of unusual activity. The result of his canvass shows that the hopes were not well founded, and 1897 closed as one of the poorest years known. In speaking of this report he says, in general terms: "Like all new statistical investigations, where the means at command for carrying on the work are limited, the results of the first canvass are not all that could be desired, but on the

whole are satisfactory. It is expected that in 1898 the returns will take yet better form."

From the reports received at Washington it appears that the value of clay products of the United States in 1897 in brick and tile was \$51,460,000 and that of pottery \$9,450,000, making a total for the year of \$60,911,000.

Of brick the State of Pennsylvania had the largest product, \$7,171,000. Of pottery, Ohio had the largest product, \$4,720,000, being 49.95 per cent. of the product of the United States. Of clay products generally, Ohio had the largest product, her aggregate of brick, tile and pottery being \$10,716,000. A number of the States produced no pottery at all. The State of Idaho produced only \$15,914 in brick. The State of Vermont only \$53,485, and Wyoming only \$3,550.

The average price of common brick in the various States is interesting. In the State where the least was made the price was the highest, \$7.24 per thousand. In New York the average was the lowest, \$4.41. Pennsylvania got a good price for her brick, \$5.69; Massachusetts, \$5.66. The average for the United States was \$5.00 per thousand. For pressed brick, California got \$37.90; New York, \$15.48; Michigan, \$5.28. The average for the United States was \$12.14. The average price of paving brick in the United States was \$8.22. New Jersey leads all of the States in the production of fancy and ornamental brick, terra cotta and fire-proofing, her terra cotta alone amounting to \$539,000, and fire-proofing to \$987,000.

During 1897, 7,180 plants reported. Of this number 1,176 were idle during the year. The reader should bear in mind that these reports are not complete, but are as near so as the government has been able to make them. Many manufacturers fail to reply to the department's inquiries. We would not be the least surprised if the value of our clay products amounted to double the sum named in the report.

The report on the Kaolins and Fireclays of Europe, by Heinrich Reis, is of a special technical and practical value. It deals with the preparation of pottery materials, glazes, the washing of clays, their rational analysis, the effect of fluxes on clays; and, on the face of the report, it bears evidence of being done intelligently and well. The range of the report extends over all European clay, France, England, Austria; Denmark, the Scandinavian Peninsula and Russia, giving a scientific and practical analysis of the well-known products in the various sections. Supplementary to this report is one on the Clayworking Industries of the United States in 1897.

THE LABOR PROBLEM.

The overshadowing social and economic problem of the hour is the labor question. The difficulty lies in the fact that labor is an unvarying law of our being and yet, in popular thought, it is too often regarded as a penalty for Adam's transgressions or a hardship imposed by some cruel authority which it is lawful to resist to the uttermost, accepting its demands only as the alternative of starvation and nakedness, whereas work is what most conspicuously differentiates man from lower animals and the civilized from the savage races. Though the motive of producing something useful to one's self or to others should be foremost, leaving food and raiment as the incident; with too many, food and raiment are a first and often the only consideration, leaving the product of labor, if there is any, a matter of indifference. In the progress of civilization there comes a division of labor, and this leads to the relation of employer and employe, every man, at times, becoming one or the other and no one ever being independent of all others. Later in this progress the concentration of capital in enterprises too great for any one man to control, becomes a necessity, hence come railroads, and mining and manufacturing corporations which necessarily become extensive employers. This has led

to an artificial classification of society, those employed choosing to call themselves laboring men and the others capitalists, and assuming that the interests of each class antagonize the interests of the other; and hence in self-protection it becomes necessary to organize, and from that comes what is known as organized labor. In the progress of development the several specific organizations have combined and there is, what is known as a federated labor organization ramifying every branch of industry which seeks to control all industrial interests and all social and political interests as well.

A DIFFICULT QUESTION.

Just what is to come of all this is the perplexing social and economic question of the hour, and it affects politics as well, for a candidate who wears breeches not made by a union tailor is tabooed by all federated labor. But a worse condition has developed. The organizations do not embrace the one-hundredth of those who must live on the products of their labor and by so much as these organizations enhance the cost of their products above a corresponding cost of the output of unorganized labor, it is a hardship.

The most damaging feature yet displayed is the closing of doors of remunerative labor against those who are not in the combine and cannot be. This has resulted in violence and death at many points, and much more is to follow. In the nature of things it cannot be possible for a handful of men to take possession of an industry and keep all others from it. The question of wages cuts but a small figure. It is the right of every man to sell his labor in the market at whatever price he and the purchaser may agree upon.

The question now to solve is, what to do in the premises. The Clay-Worker has no suggestions, because the case has passed the domain of argument and it has entered that stage in which nothing but the cold logic of events can be heard with effect. Mr. Lincoln was no prophet when he said this nation cannot exist half slave and half free; he was only a reader of conditions. To suppose for a moment that the unorganized ninety and nine will always tolerate the tyranny of the hundredth man is absurd. But, like the other form of slavery, it must go out in its own madness. The trend of opinion is against combines, and the most damaging of all is the combine of labor.

BRITISH FIRE PREVENTION COMMITTEE AND ITS WORK.

The work of this Committee is to colate, edit and publish material relating to fire prevention. Thus far they have issued nine pamphlets under the following titles: "What is Fire Protection?;" "American Opinions on Fire Protection;" "Paris Bazaar Fire;" "Theatre Exits;" "New York Fire Department;" "Cotton Fires and Cotton Bales;" "Fire Resisting Floors used in London;" "Fire Service in Factories;" and "How to Build Fire Proof." The last named is a paper by Francis C. Moore, President of the Continental Insurance Co., and delegate from the Board of Fire Underwriters to the Board of Examiners of the New York Building Department. This report is of especial interest to builders dealing with the insurance value of constructive details. It considers slow burning construction, fire proofing of iron members, rust, expansion of metal, relative expansion of iron and masonry, unprotected iron work partitions, height of buildings, thickness of walls, skeleton construction, beams and girders, and, in truth, is a comprehensive and valuable report which will add largely to the world's stock of knowledge in a practical, available form. The general line of reports mentioned is considered by a committee composed of an imposing array of English architects, engineers, factory

managers, merchants and theatrical managers, and is in keeping with the modern thought of thorough, systematic investigation along special lines.

TRADE LITERATURE.

The Wallace Manufacturing Co., of Frankfort, Ind., is to be congratulated on the possession of one of the handsomest leaflets that the clay trade has seen for 10, these many moons. In both design and execution it is original and extremely attractive. It strikes us that the recipient of a copy must be impressed with the idea that "Wonder Machinery" is first-class machinery, for a firm getting out first-class advertising matter is sure to get out first-class machinery. We advise our readers who appreciate a good thing, particularly those using stiff clay machinery, to write to the Wallace Manufacturing Co. for a copy of this pamphlet, which is beautifully illustrated with cuts of their Big and Little Wonder Brick and Tile Machines, Open Top Pug Mills and Cunningham's Combination End and Side Cut Automatic Brick Cutter.

The Architect's Catalogue of Face Brick, made by the Ohio Mining and Manufacturing Co., of Shawnee, Ohio, is another valuable contribution to the literature of building materials. The products of this concern, thanks to the wise management of W. D. Richardson, are now well and favorably known, but this catalogue is particularly valuable in showing the architect the various forms and shapes that may be utilized advantageously in actual construction. It is work of this character which is helping to lift the building trades and clayworker's art above the commonplace. A few of us only are gifted with much imagination, and when we see new forms and beautiful details, all of us are not able to make use of them in a concrete way. A decided novelty which it illustrates is the use of round brick, which are utilized in the manufacture of circular columns. We commend this catalogue to those interested in the use of decorative brick. The book is substantially bound and handsomely printed.

THE CERAMIC ASSOCIATION'S NEW OFFICERS.

The Ceramic Association of the Ohio State University held its first regular meeting for the year 1898-99 on Tuesday evening, September 27, with a good attendance.

After the election of a temporary secretary to take the place of Mr. Chandler, who has been obliged to discontinue his studies on account of his health, officers for the year were elected as follows:

President—L. E. Barringer, of Washington, D. C.
Vice-President—J. F. Butler, of Houston, Texas.
Secretary—M. P. Post, of St. Louis, Mo.

The work for the coming year was then discussed and plans mapped out, in which all took an active interest, so that prospects are bright for even better progress than was made last year. The policy inaugurated last year of inviting, from time to time, well-known clayworkers to address the Association will be continued, as much good resulted from these meetings of the young clayworkers with the older men of practice and experience.

ASPHALT ENGINEERING.

Asphalt advocates tell us that their experts, chemists and others prescribe different compositions for different streets under different conditions. We strongly suspect that these differences in prescription are those which have to do with economy of construction to the asphalt companies rather than physical excellence as related to the city. We have certain pavements in Indianapolis where asphalt has been used which show fair service. There are certain new pavements in the outskirts which have been down only a short time but which are now

showing serious depreciation. We know of one particular pavement which has been down only a relatively short time, but which is already in a dangerous condition next to the car tracks. The pavement has forced itself well above the tracks, is very irregular, is very injurious to vehicles and decidedly dangerous to wheelmen. Evidently an inferior composition has been prescribed for this street, but we do not hear asphalt pavements condemned because of that. If a brick pavement was to prove so unsatisfactory, we would be told that brick pavements are failures—why the difference?

FIRE-PROOFING.

The question of fire-proofing has received serious attention from the architects of this country during recent months. A decision is unanimous that when the best is wanted, the best forms of burned clay products must be used. When the cheapest is wanted, it is cement. This is the gist of several months of discussion, bringing out the best experience of all of the well-known architects of this country.

FROM EMPLOYE TO PROPRIETOR.

A new name appears on our back cover space, where that of the Wolff Dryer Co., has been conspicuous for several years. That firm now passes from view and A. F. Barron's name is substituted. As is pretty generally known, Mr. Barron has been connected with the old firm for years past, having superintended the erection of many Iron Clay Dryers in all portions of the country. Consequently he is well known to brick and tile makers generally, very many of whom will be pleased to know that he has stepped from the position of employe to that of proprietor. We extend our congratulations and wish him a large measure of success, which should be his portion, for he understands thoroughly the dryer business in all its details.

A CENTURY RUN.

The Williams' Patent Crusher and Pulverizer Co., St. Louis, Mo., are making extensive improvements in their factory. Additional buildings have been erected and a new power plant put in, largely increasing their capacity, which has been taxed to the limit throughout the summer. The demand for their pulverizer is greater than ever before. Since the first of the year they have sold more than a hundred of these machines, completing a century run, as it were, of which they are quite proud. Mr. Williams is more than ever convinced that "nothing succeeds like success," and is more than half convinced that he should have named his pulverizer, which is pictured on page 309, "The Success Pulverizer," for its record of successes is remarkable.

AN INVITATION TO THE PEACE JUBILEE.

T. A. Randall, Esq., Secretary National Brickmakers' Association:

Dear Mr. Randall:—As perhaps you know, the city of Chicago is going to give a great demonstration on the 17th, 18th and 19th of this month, known as the Peace Jubilee. The grand military parade on the 19th, which is to be reviewed by the President, will pass our office.

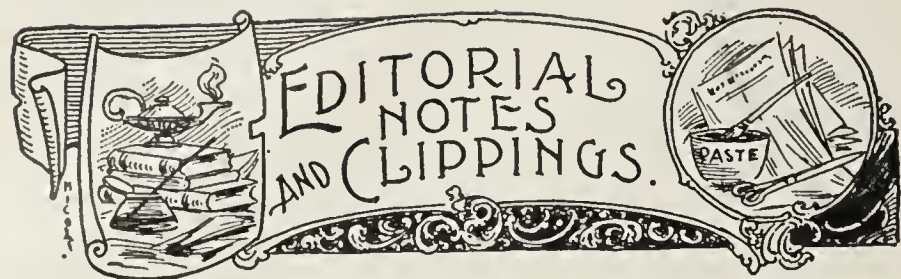
We wish through the Clay-Worker to extend an invitation to members of the N. B. M. A., and all brickmakers who visit Chicago during the Jubilee, to make our office their headquarters and watch the parade from our windows, which have a good view of President McKinley's reviewing stand. Very truly yours,

CHICAGO BRICK MACHINERY CO.,

Chicago, Oct. 10, 1898.

John J. Moroney.

Mr. Fritz Wagner, of the Northwestern Terra Cotta Co., Chicago, Ill., has offered three prizes, 1st of \$50.00; 2d of \$30.00, 3d of \$20.00, for the three best designs for a terra cotta column and lintel with wall surface above, to be competed for by members of the Chicago Architectural Club. We hope to lay the winning designs before our readers in due time.



S. C. Smith will establish a brick plant at Colon, N. C.

C. A. Lower has purchased the brickyard of Dale & Roache, at Cicero, Ind.

A brickyard will be started at Apex, N. C., by Jos. J. Rogers and J. B. Parks.

A brick plant will be established at Flatbush, N. Y., on the land of John Reis.

H. H. Melick, of Roseville, O., will establish a paving brick plant at Cambridge, Ohio.

A loss of \$125 was caused by fire at the brick plant of A. F. Edwards at Kansas City, Mo., recently.

The tile factory of D. Curtis, Wingate, Ind., which has been idle for three years, has resumed operations.

The Builders' Brick Manufacturing Co.'s plant at Hooper, Neb., was damaged to the extent of \$500 by fire.

Reid Brick Co.'s plant on Woodburn ave., Walnut Hills, Cincinnati, O., was damaged to the extent of \$1,000 by fire recently.

Wm. Downer has discovered a good supply of clay at Irondale, O., where he will establish a brick plant in the near future.

O. P. Worseley has sold his tile factory at Triumph, Ill., to Mr. Wilson, of Earlville. Mr. Wilson will take possession at once.

Geo. E. Fell & Co., brick manufacturers of Trenton, N. J., have purchased the brick plant of Howard Newell at Florence Station.

Horton & Mabie, fire brick manufacturers of Peekskill, N. Y., have dissolved partnership. Mr. Horton will continue the business.

Chas. Gleeson, of Carrollton, Mo., writes that he is in the market for a complete stiff-mud equipment, including machine, pug mill, crusher, etc.

David Mullen contemplates some extensive improvement at his brick plant at Warren, O., in the shape of larger buildings and permanent kilns.

A. O. Benjamin, of Greenville, Pa., writes that a company has been organized to manufacture paving brick. The plant will be located at Conneaut, Ohio.

The Mt. Savage (Md.) Fire Brick Co. are very busy these days, and in connection with their regular trade are making large shipments to Santiago, Cuba.

Chas H. Price has purchased the brickyards of F. S. Hartzell, near Telford, Pa. He will enlarge same at once and go into the business on an extensive scale.

The demand for brick and tile at New London, Iowa, is so good that C. E. Magers, contemplates putting in a new machine to enable him to meet the increased demand.

The brick yard of Edward Carr, at Danvers, Mass., was damaged to the extent of \$5,000 by fire October 3. The fire is thought to have been caused by an overheated kiln.

Warden French, of the Federal prison at Leavenworth, Kan., has been given authority to purchase brick machinery with which to equip a yard in connection with the prison.

The plant of Mr. Mench, brick manufacturer at Grants Pass, Ore., was badly damaged by fire recently. The loss is estimated at \$1,400, which is partly covered by insurance.

It is rumored that there is an opening at Blue Earth City, Fairbault county, Minnesota, for a good brick plant. There being a good demand there for brick and the nearest yard is 40 miles distant.

The Ensley Brick Works at Ensley, Ala., which were but recently completed, are now rapidly being enlarged to double the present capacity. In a short time they will be turning out 40,000 brick per day. A belt to the governor slipped off a few weeks since and the big fly wheel was torn to pieces by the

CONTINUED ON PAGE 300.

TABLE OF CONTENTS.

Terra Cotta Fronts.....	261	New Haven News.....	284
Button-Hole Talks.....	262	Making Brick in Faraway India	285
Modern American Front Brick	263	The Situation in Chicago	285
How Lo Makes Brick.....	265	An Invitation to the Peace Jubilee	297
Paving Brick in New York City.....	266	Trade Notes from Zanesville, O.	300
Paving Brick in St. Louis.....	268	The New York Market.....	304
Brick Masonry	269	St. Louis Notes	304
Good Roads.....	269	Pacific Coast News.....	306
Brickyard Sketches.....	270		
A Brick Factory in a Wooden Town	272	EDITORIAL:	
What Kiln Shall I Build?.....	273	Current Comment.....	295
Anglo-American Pottery.....	276	Paving Brick in Large Cities... ..	295
National Quarantine.....	279	Statistics of Clayworking	295
The Ceramic Department of the Ohio State University....	279	The Labor Problem	296
From Brickyard to Bar.....	279	A Difficult Question	296
Baltimore Brickyards	280	British Fire Prevention Committee and its Work	296
Obituary—Theodore Fredericks, Ira L. Otis, Hector McLean ..	281	Trade Literature	297
An Improved Sewer Pipe Press ..	282	The Ceramic Association's New Officers	297
German vs. American Methods ..	282	Asphalt Engineering	297
The Season in Maine.....	283	Fire-Proofing.....	297
The Use and Abuse of Clay-working Machinery....	294	Editorial Notes and Clippings ..	298
No Sweating, no Swearing.....	294		
Promise Something Good	294	MISCELLANY:	
From Employe to Proprietor..	297	Golden Rules for Merchants and Manufacturers.....	264
A Century Run.....	297	A Growing Barn	264
		Actions Speak Louder Than Words	275
CORRESPONDENCE:		A Business Proposition	278
Busy Times for the Brickmakers of Cleveland.....	284	Clay Cast like Iron.....	285
Pavement Guarantees—A Contractor's Views	284		

Index to Advertisements on Inside Cover Page.

WANTED POSITION—Manager or superintendent; will take full charge of plant. Fire brick, cupolas, etc., common, red, building, paving and other goods. All kinds of kilns. Address 101 em D. K., care Clay-Worker.

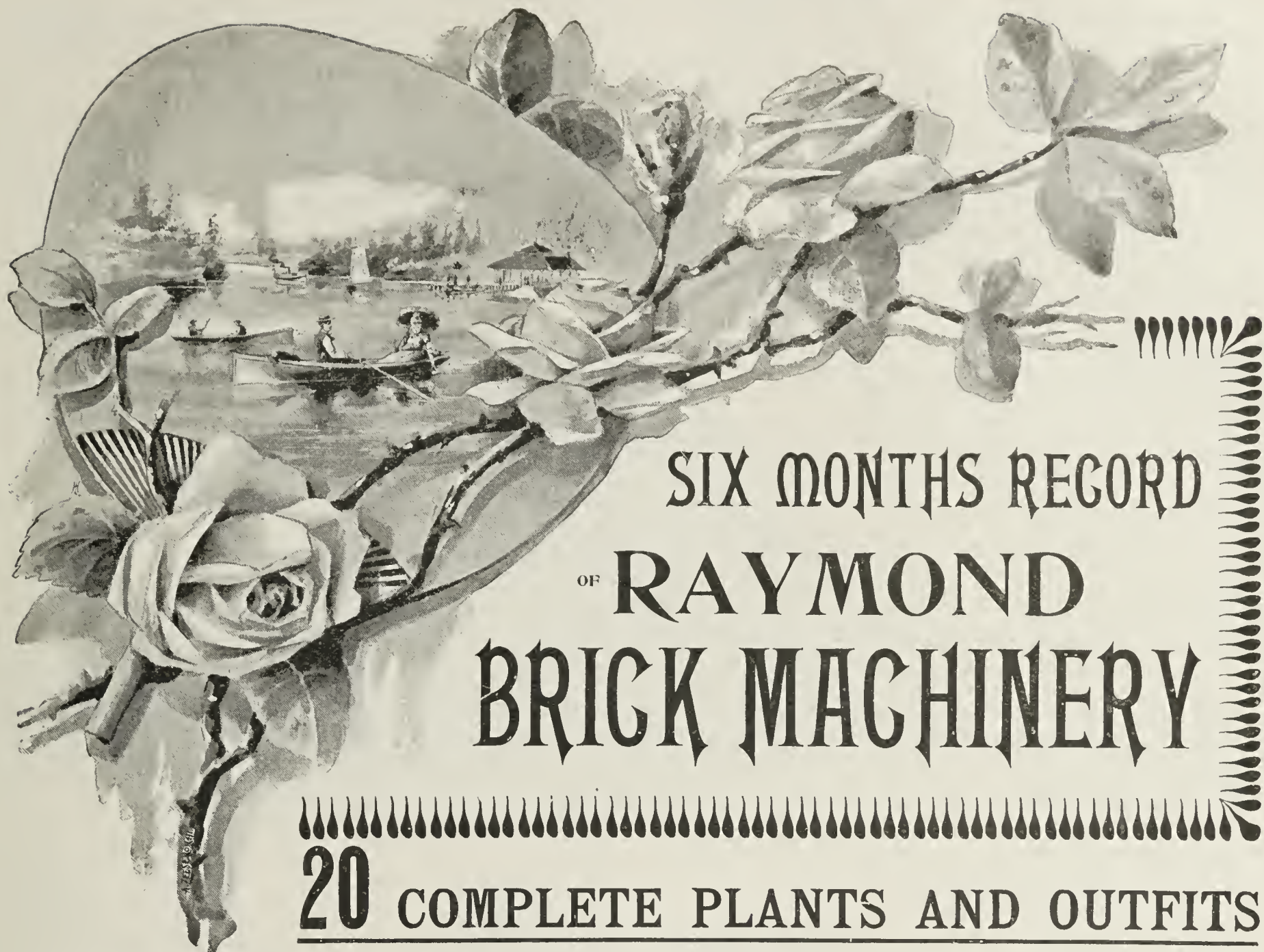
Books for...

Brickmakers.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.



of this famous machinery sold and placed in successful
 ✱ ✱ ✱ operation during that time. ✱ ✱ ✱

Augusta, Ga. Outfit, 50,000 brick per day, with Automatic Cutter.
 Bolivar, Pa. Complete Plant, 50,000 brick per day, with Automatic Cutter and Re-presses.
 Toronto, Canada. Outfit, 50,000 brick per day, with Re-presses and Automatic Cutter.
 Opelousas, La. Complete Plant, 30,000 brick per day.
 Kingston, Jamaica. Complete Plant, 30,000 brick per day with Re-presses.
 Lewiston, Pa. Outfit, 30,000 brick per day.
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 Vanport, Pa. No. 1. Outfit, 50,000 brick per day, with Re-press and Automatic Cutter.
 No. 2. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
 Doniphan, Mo. Outfit, 30,000 brick per day.
 Punxsutawney, Pa. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
 Cassadaga, N. Y. Outfit, 30,000 per day.
 Sieglerville, S. C. Outfit, 25,000 per day.
 Thomas, Alabama. Complete Plant, 50,000 per day, with Re-press and Automatic Cutter.
 Pittsburgh, Pa. No. 1. Outfit, 50,000 per day with Re-presses and Automatic Cutter.
 No. 2. Outfit, 50,000 per day, with Re-press and Automatic Cutter.
 Edenberg, Pa. Complete Plant, 30,000 per day, with Re-press.
 Mexico City, Mexico. No. 1. Outfit, 30,000 per day.
 No. 2. Complete Plant, 50,000 per day, with Automatic Cutter.
 Abbeyville, Ga. Outfit, 25,000 per day.

COULD A BETTER - - -
 TESTIMONIAL BE OFFERED?



C. W. RAYMOND & CO., DAYTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

speed developed, and the parts scattered to all parts of the plant, but fortunately no one was hurt and no damage was done to any of the machinery.

Iler & Stone is the name of a new firm recently organized at Revenswood, Mo., for the manufacture of drain tile. Mr. Iler has had practical experience in the business, so the venture is sure to be successful.

Sam'l Huggins, who has manufactured brick for many years at Hartford City, Ind., has added a tile machine, and as there is no other tile manufacturer in his vicinity expects to make the venture a profitable one.

The brick yard of Wm. Finnegan, at Green Bay, Wis., which has been idle for some time has been purchased by Hinkley & Power, who will at once put same in operation. Later on they will make extensive improvements in the plant.

Oliver W. Dunlap, of the firm of Elder & Dunlap, brick manufacturers, Bloomington, Ill., has crossed the State line, and carried off a Hoosier girl, having wedded Miss Maude Coates at the home of her parents in Valparaiso, Ind., October 12.

C. W. Raymond & Co., Dayton, Ohio, report a very satisfactory summer's work with flattering prospects for the coming season, inquiries for their represses, cutting tables and stiff-clay brick machinery indicating very busy times ahead.

On the evening of Sept. 24 the plant of the Morgan Brick Works at Trenton, N. J., was almost totally destroyed by fire. Most of the machinery was damaged to some extent. The origin of the fire is not known, and the loss is estimated at \$3,000.

Jno. Torrent has erected a new brick plant at Highland Park, Mich. The plant, though now about completed, will not be operated actively until spring. The works have been equipped with modern machinery, and when work is begun in earnest will have a daily capacity of 50,000 brick.

The local paper at Boyne City, Mich., says there is a good opening in that city for a brick manufacturer. Large quantities of brick are shipped in there, while there is good clay available, and an enterprising man with a little capital will find it to his advantage to locate there.

All lines of trade at Atlanta, Ga., are improving. Chief among them is that of the brick industry. W. D. Palmer, president of the Palmer Brick Co., says the demand for brick is attaining unusual proportions, and that he is confident the improvement in demand will be permanent.

The demand for brick in Toledo, Ohio, at the present time is very good, so much so that the price has advanced 50 cents on the thousand, bringing them up to \$5.25 for common brick, \$5.75 foundation brick and \$6.00 for sewer brick. The manufacturers are shipping many brick into Michigan.

B. D. Walcott, president of the Indianapolis (Ind.) Terra Cotta Co., states that at no time in the last seven years has the company had so many orders on their books as at present. Should they not get another contract until next spring their present orders would keep them busy until then.

Our good friend Jas. H. Horner, of Astoria, Ill., writes that the brick business in his town has been dull the past season. He says he is still making brick by hand and dumping them on the ground, but the continued wet weather the past season has caused him to consider a change in his methods.

The Moore Brick Co. reports business booming at their plant at Vanport, Pa. They have recently increased their capacity, having placed an order with the American Clay-Working Machinery Co. for an Eagle repress, cutting table and grinding pan, thus enabling them to turn out 25,000 daily.

W. T. Tasker, business manager of the Don Valley Brick Works, Toronto, Ont., says this is the most prosperous year in the history of the company. They have already turned out 10,000,000 brick and are now running night and day to fill orders. Prices range from \$6.50 upward for ordinary brick.

The McCauley-Miller Clay Co., of Dennison, O., has been incorporated with a capital of \$10,000. The new company has erected a plant where they will manufacture common red brick, fire brick, tile, grave vaults and tile fence posts. Those interested are Wm. McCauley, W. J. Miller, J. N. Moore and W. T. Perry.

Jno. Varette, of Berkeley Heights, N. J., was struck by a locomotive as he attempted to cross the railroad tracks at Summit, N. J., and sustained injuries from which he died

three hours later. Mr. Varette was 50 years old and had an interest in the Berkeley Heights brick yard. He had resided in Berkeley Heights about ten years, being a native of France. A wife and several small children survive him.

E. B. Spaulding, well known throughout the States of Maine and Massachusetts as a brick manufacturer, died at his residence in Everett, Mass., September 25. Mr. Spaulding was close to eighty years old, and had been retired from active work for some years. He leaves a widow, one son and one daughter.

The Twin City Brick and Building Association is the name of a new corporation organized in Kansas City, Kan., by a number of colored men. The company has already established a plant and have it in full operation. The officers are Jno. R. Smith, president; E. L. Thompson, business manager and general superintendent.

G. W. Reed, proprietor of the Reed Brick Works, at Abbeville, Ga., died at his home in that city Sept. 23. Mr. Reed had been a resident of Abbeville scarcely two years, but in that short time has won the respect and good will of all to such an extent that his demise will be felt by the entire community. He leaves a wife and several children.

In a recent letter Tom Richardson, secretary of the Houston (Tex.) Business League, writes that they would like to correspond with manufacturers of drain tile. He further says: "There are three million acres of land in Coast county quite famous as a producer of fruit, flowers and vegetables which I honestly believe can be trebled in value by underdrainage."

The Atlas Bolt and Screw Co., Cleveland, Ohio, has been exceedingly busy for the past few months, during which time they have run their large plant night and day and still have orders ahead which will keep them going full handed for weeks to come. The manufacture of brick cars and trucks, of which they make a large variety, is but a small part of their business, but they are glad to quote prices for anything of the sort.

Brick pavements are growing more and more in favor as their merits become known. Among the cities that are now putting down brick pavements, or will soon let contracts for paving with brick are the following: Bangor, Me., Beloit, Wis., Sioux City, Iowa, Winchester, Md., Bloomington, Ill., Bay City, Mich., Alexandria, Va., Tampa, Fla., Council Bluffs, Iowa, and Elkhart, Ind., while among the cities where the subject is being agitated are Marion, Ohio, Waterbury, Conn., Benton Harbor, Mich., LaCrosse, Wis., Annapolis, Md., and countless others.

James B. Meeds has filed a suit in equity against the Blatchford-Meeds Brick company, Pittsburg, Pa., asking for a receiver for the concern and praying for an injunction restraining the company from disposing of any of its property. The capital stock of the company was \$40,000 when it organized, and a plant in Plum township was operated. The plaintiff says the financial condition of the concern is bad and the plant is subject to a lien at any time. The unsecured debts are \$9,500, of which \$2,300 is for wages. The indebtedness is all overdue and executions are threatened.

TRADE NOTES FROM ZANESVILLE, OHIO.

The Townsend Brick Co. are running full capacity and extra time to fill their orders. Paving brick is their leading line. There are but few yards that can compete with the Townsend Brick Co. on common brick, as they have a capacity of 75,000 per day and burn them in continuous kilns, which are much cheaper for burning common brick. Prices are about the same as last year, but prospects seem better for next year.

The Harris Brick Co. is also running full-handed on paving brick, common and dry-pressed brick, making from 50,000 to 60,000 daily. They have one four-mold Simpson dry press, and make a very good brick.

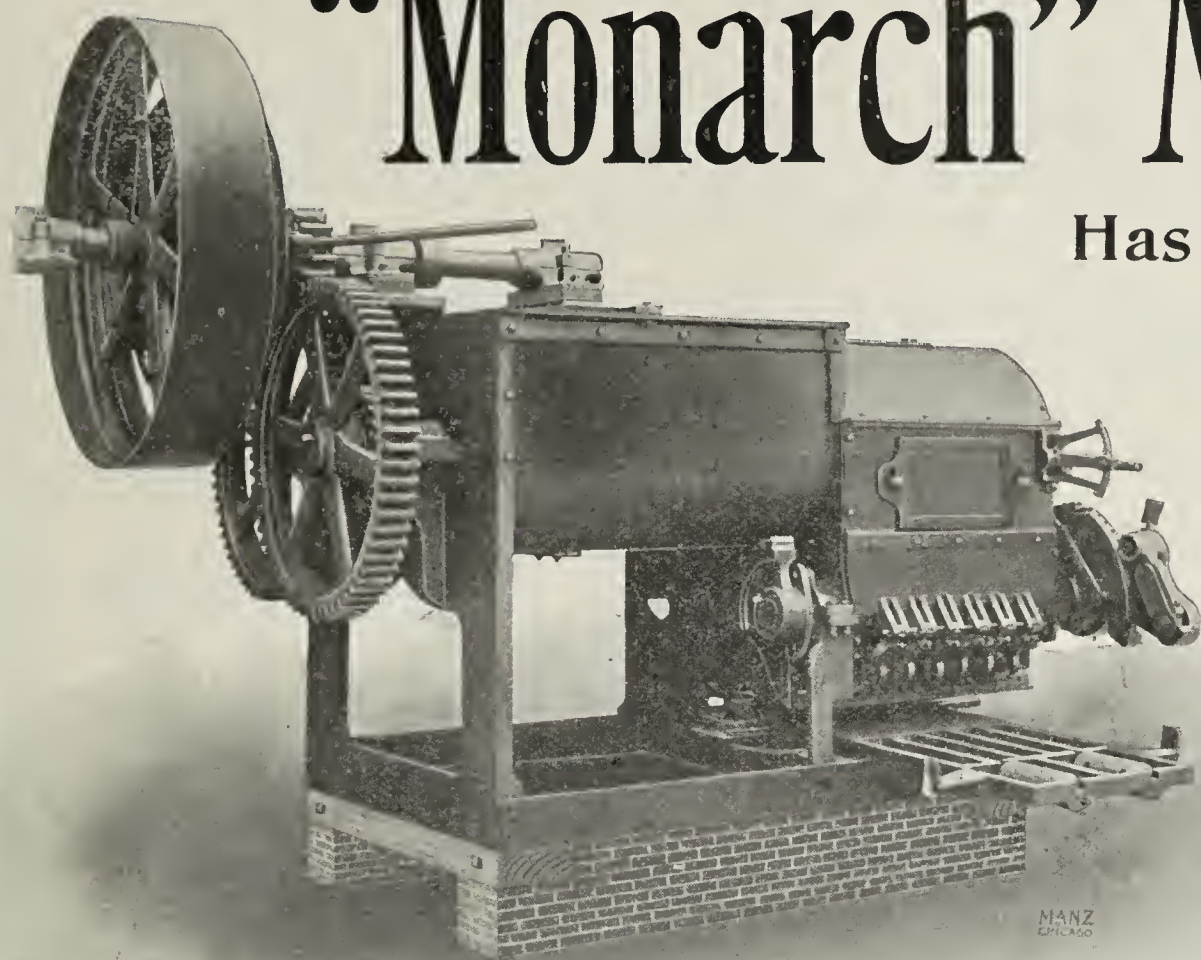
The Buckeye Pressed Brick Co. have a daily capacity of 30,000, and are running right up to the limit. They have one four-mold Lion machine and a two-mold U. S. machine. They make buff and mottled standard and ornamental fronts, and have all of their brick sold, and orders ahead for three million.

All of the tile works and potteries are in active operation, and no complaints are heard. Clay business in general promises to be still better next year.

"BUCKEYE."

FOUR STYLES OF....

"Monarch" Machines



Has Double Pug Mills,

Giving the most tempering capacity of any Machine made.

Double Presses

Giving the most pressing capacity of any machine made.

Presses

Are "all in the mud," thereby eliminating all unnecessary friction and wear.



These and other MOST IMPORTANT points which are

IN NO OTHER.

The "Iron Quaker" Machines

For 1898 are BETTER THAN EVER.

This cut shows the steam power in connection with our Mould Sander.

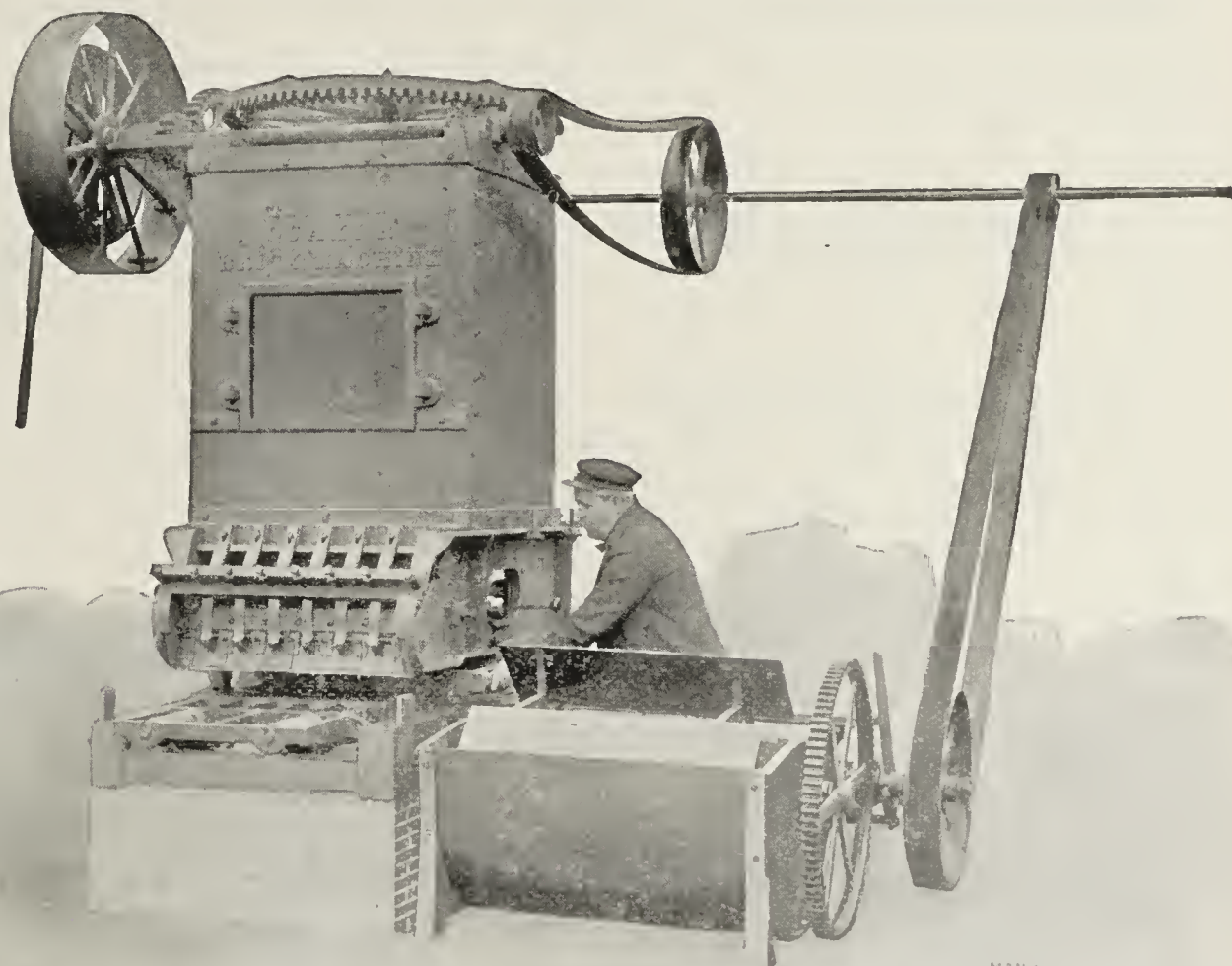
Our Horse-Power Machine

Is the most generally used of any made. Simple and reliable and the price is right

All other Auxiliary Machines and supplies.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE. At Bargain Prices.

Odd sizes of moulds. Have not been used.

20 moulds, 8 13-16 x 4 3-16 x 2 7-16. 9-16 in. partitions.
2 moulds 9x4 1/2 x 2 3/4. 9-16 inch partitions.
3 hand moulds (3's) standard size.

Second-hand, but used a few days only.

10 moulds, 9 1/2 x 4 9-16 x 2 3/4. 1/2 inch partitions.
19 moulds, 9 1/2 x 4 5/8 x 2 9-16.
16 moulds 9x4 1/2 x 2 1/2. 9-16 inch partitions.
19 moulds, 9 x 4 3/8 x 2 1/2.

The Wellington Machine Co.,

WELLINGTON, OHIO.

Send for Circular.

The Des Moines Brick Manufacturing Co.,

—MANUFACTURERS OF—

Vitrified Paving Brick,

DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities

Estimates on Brick pavements cheerfully given.

The Clinton Paving and
Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: Clinton, Ind.

INDIANA PAVING BLOCK,

The Standard Shale Block for
Street Paving.

Manufactured at Brazil, Ind., by the

Indiana Bermudez Asphalt Co..

Main Office, 25 and 26 Baldwin Block,

INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.

W. C. SIBLEY, PRES.

J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES,
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of \$1.00.

T. A. RANDALL & CO.,
Publishers,

INDIANAPOLIS, IND., U. S. A.

T. B. McAVOY,
President.

FRANK B. McAVOY,
Secretary and Treasurer.

McAvoy Vitrified Brick Company,

OF Philadelphia, Penn.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee. Correspondence solicited.

OFFICE:
1345 Arch St., Philadelphia.

WORKS:
Perkiomen Junction, Penn.

The Purington Paving Brick Co., of Galesburg, Illinois,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business. Correspondence respectfully solicited.

THE NEW YORK MARKET.

THE BRICKMAKING SEASON has reached that point where the boss counts the number of pits that he would like to mold, or, that it will take so many pits to fill his shed. Weather conditions will materially change all calculations. If October should continue dry, with north-westerly winds without frost, there is no doubt that many will mold late. Some yards would be well filled, one in particular. If twenty more molding days are vouched for, the entire capacity will be filled, ninety-two arches, or something over four million of brick will be under shed. Other yards will not have their sheds full, as they have been free shippers during the summer, thereby making space under shed which will not be completely filled. One of the bosses who has two yards adjoining has seven green kilns to burn this fall, so that if he should begin burning the first of October, and kept steadily at it, he would not finish up until the first of December. If Providence, room and good weather permit, he would like to make and burn about four arches of a coal kiln, just to see if he, without any experience, could make it a success. Room under shed this season is scarce, but, if he should ship freely for a week, he might have room. Some would say, just put it off for a more convenient time, when the loss, if any, would not be a burden. Although the present price is remunerative, it would not be to some if much experimenting should be indulged in.

—The Strike.—

The strike on the yards at Haverstraw is, happily, a thing of the past, and the yards are producing about 60 per cent. of their usual quota. As mentioned in last number, the end was not then reached, although on the 25th of August all were at liberty to go to work. One of the yards, after that date, brought a gang of Italians to work on the yard. During the night of their arrival the shanty was fired on by the strikers and one of the inmates hit. The next morning the shells found showed that Winchesters had been used, and for more than a week there was more or less trouble. The strike of 1898 was a record-breaker.

—Holding Back Wages—

On the yards at other places on the Hudson was used as a means to hold the men from going back to work on the Haverstraw yards after the strike was over. At present all yards are short of men along the Hudson, Hackensack and other points. Where the men have gone so early in the season is the question.

—Affect Prices.—

Last June, when the strike begun, the market was firm, but yielding slowly in price, with a range from \$5.75, \$6.25 and \$6.50 for specials. One would say that with Haverstraw out of the market it would hold steady. Just the opposite—less brick going on the market, and prices gradually giving away. One week after molding began in earnest at Haverstraw they touched as low a figure as \$4.75, with the confident expectation that they would go far below that rate. As usual, the unexpected happened; the shipment was not as free as looked for, but decidedly the reverse, with a corresponding disappointment to the buyer.

The result will, if properly handled, be a great benefit to the manufacturer, as he is near the end of the molding season. The buyer put off the evil day of stacking stock for winter use, confident that Haverstraw would soon be a shipper, and freely—and they are left.

—The Outlook—

For the use of brick this fall is no better than a year ago, if as good. The number of new buildings from Jan. 1 to Sept. 24 is 2,594 for 1898. Covering the same length of time in 1897 there were 2,659, just 65 more permits in 1897 than this year. Nothing to cause a very great demand for brick in the near future. In Brooklyn the total number of permits for the same length of time in 1897 was 2,402; in 1898 it is 2,346, or 56 more in 1897 than the present year.

—The Market—

Is in the hands of the seller, being so near the time when he can hold without any great stress to him, with certainly more money in sight later on, if he handles his stock with any judgment. Monday, the 19th of September, the largest sale of the season was consummated; thirty-three barges went out of market, making at least eight million brick sold on that date, with the total arrivals for the week of fifty-five barges. Pale

brick has quite a call at \$3.75 and \$4—about a hard-brick price of a year ago. The best grade will bring \$6 per M., with other grades close behind. Hackensack are gradually creeping up, with the present week showing at least \$5.67½ and possibly \$5.75. Those which are slightly off in color are classed as light hard, and command \$4.25. Certainly such figures before the close of navigation, with a shortage of many million brick, should insure a higher rate before the stock of 1899 reaches the market, with any judgment used in shipping.

A. N. OLDTIMER.

ST. LOUIS NOTES.

THE MONTH OF September showed an improvement in number of building permits, but the aggregate was nothing to boast about. The prices for common brick are still ruling low, but the first week in October shows a tendency to stiffen prices. Your readers may not be aware of the fact that 95 per cent. of all building brick produced here are made by the dry-press process. This necessitates good weather to harvest clay. The past season has not been "good." The clay sheds at this season should be full, but they are only partly filled. Some of the yards have begun to realize this fact, and unless there is exceptionally good weather between now and Nov. 15, brick will be considerably higher in the spring.

Red pressed brick or "stock" are actually scarce, yet the ruling price for the very best quality is \$10.00 per M, delivered at building. This figure is ridiculously low, and it would be just as easy to get \$15.00, but some time ago the Brick Makers' Association was anxious to establish a uniform price for stock brick and requested the Hydraulic Press Brick Co., as they controlled the situation, to set the price. The Hydraulic Co. responded by reducing the then current price of \$13.00 to \$10.00 per M., and it has been \$10.00 ever since. The unfortunate part of the affair to all concerned is, that a \$10.00 delivered price makes an \$8.00 quotation F. O. B. cars for foreign shipments and the darker colors or No. 2 grade are piling up in the sheds. This may be good business policy, but it doesn't appear so to "the man up a tree." The day is past when combinations can dictate a policy or prices to others.

Poor business for the last three years has weakened the market. Prices have been low, profits have been lower, surplus funds have been absorbed. Stockholders have been put off with one excuse and another, and the times are not now propitious to keep up a fight to make your competitor lose 50 cents and you lose a dollar. The sooner the signs of the times are read, the better it will be for all industries, and if some of the brick-makers in St. Louis have not been "up a tree," they had better climb the first one they come to and look over the situation.

—An Illustration.—

The tobacco trust has had a long fight, ending in a cash deal of \$3,500,000 in the purchase of the Drummond Tobacco Co. of this city. It is stated that actual assets are less than \$500,000 and the balance is made up of good will, brands, etc. The deduction from this fight is, you can't rule by making war on your competitors. The worm has an endless amount of vitality and grit as well, he will turn if he can, and if he can't he will squirm.

The contract has finally been let for another office building on Sixth and Olive streets, T. C. Link, architect. The design is very handsome and contemplates brick and terra cotta for exterior. There is also a fine mercantile building in progress of erection on Fourth and Vine streets, T. B. Annan, architect. Exterior stone and terra cotta.

Cheap money is inducing some speculative building in swell houses and flats, but the present outlook is not very encouraging.

On Sept. 30th there was a row in the school board over a brick resolution. The interesting part to brick men was the difference of opinion on red versus buff and other color brick. The school board adopting a resolution advocating the exclusive use of hydraulic red pressed brick in school buildings. The argument being that colored brick were passe and that red were again coming in style. During the afternoon the St. Louis and Chicago telephone lines got mixed up, and when the board adjourned all the brick men in St. Louis using telephones heard S. S. Kimbell laugh. "And the next day it rained."

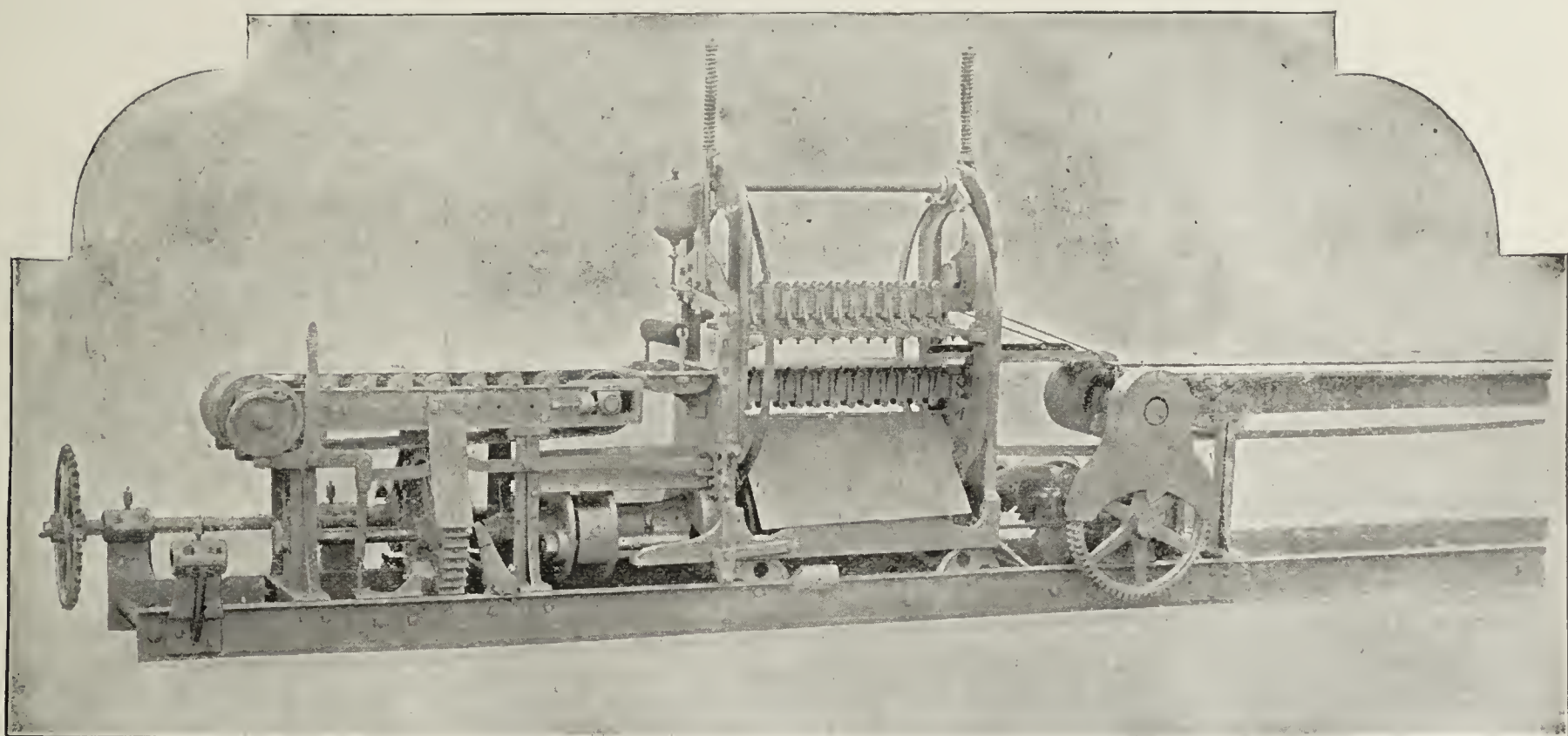
A. SAINT.

The Ear Marks of Originality are so
Prominently Displayed in the



Cunningham's Improved Combination Automatic End and Side Cut Brick Cutter,

That we Feel Justified in Claiming Priority.



There is a difference of opinion as to whether end or side cut brick is the best. With this Cutter, you can give your customer just what he wants and not what you happen to have.

For particulars regarding this Cutter, and a full line of Brick and Tilemaking Machinery. Address,

Wallace Mfg. Co.,

CHICAGO AGENTS:
Chicago Brick Machinery Co., Chicago, Ill.

FRANKFORT, IND.

See Ad. on Page 335.

PACIFIC COAST NEWS.

THE CLAY and brick industries in the Northern sections of California, Washington and Oregon are in a very satisfactory condition. Reports are constantly coming in of new buildings going up and of other improvements being made which tend to stimulate the clay industry at these points. Of our local trade we cannot speak so encouragingly, for the fact is, the supply is much more than the demand, consequently the bricks are sold in many cases at a less price than they can be manufactured for. While considerable building is being done most of the time, less brick is used than formerly, since so many foundations are now made of concrete, which makes at least one-third the amount less brick used in all buildings where concrete foundations are used. What the outcome will be it is hard to predict. However, while at present the local trade does not offer much encouragement we cannot tell what may be in store, something may occur that is not looked for, and the situation may be entirely changed.

The Remillard Brick Co., of Oakland, Cal., reports their yards at San Rafael, Pleasanton and San Jose, all busy on common, pressed and stock brick.

Clark & Sons, San Francisco, are running along smoothly at their yard. Building brick and terra Cotta are mostly in demand.

The Wetson (Ore.) Brick Yard has received an order for 400,000 bricks, to be used in the new machine shops of the Gilbert Hunt Mfg. Co., at Walla Walla, Wash., and in the new foundry of J. L. Roberts, whose establishments were both recently destroyed by fire.

The agent for the Washington Brick, Lime and Manufacturing Co., of Spokane, Wash., has secured the contract for furn-

ishing the pressed brick and lime for the new school building at Walla Walla, that State. The company is also furnishing brick for Weinhard's new building at Dayton, Wash.

Work will be started in about two weeks by the Western City Mfg. Co., of Portland, Ore., at their works in North Portland. Sewer pipe and chimney pipe will be turned out. The works have been closed down for several months.

The Mexican Clay Manufacturing Co., of the City of Mexico, Mexico, has taken from its kilns the first lot of clay, which is to be used in the city sewers. The pipe was not the best, but was all that the company expected, as they are working with new clay, and everything is still to a certain extent in the experimental stage. The second lot has now been put in the kilns, and will be better than the first, as the company has now found out where improvements can be made in making the pipe. The lot just finished was large pipe.

There is a demand for building brick in Riverside, Cal. In fact, contractors are finding it hard to secure brick enough for foundations even. At present there is a good deal of building going on throughout the valley, and as brick will be required, they will have to be brought in from other places.

Angus Johnson and Luther Spainhower are burning 300,000 brick for the creamery at Tempe, Arizona.

Through the heavy rains and floods, which visited Naco Junction, Arizona, and vicinity recently, Balter Bros., of that place, lost over 35,000 bricks.

The Holt & Gregg Co. have burned something over 900,000 brick at their yard near Anderson, Cal., this season, and if the weather is favorable another kiln of 300,000 will be burned.

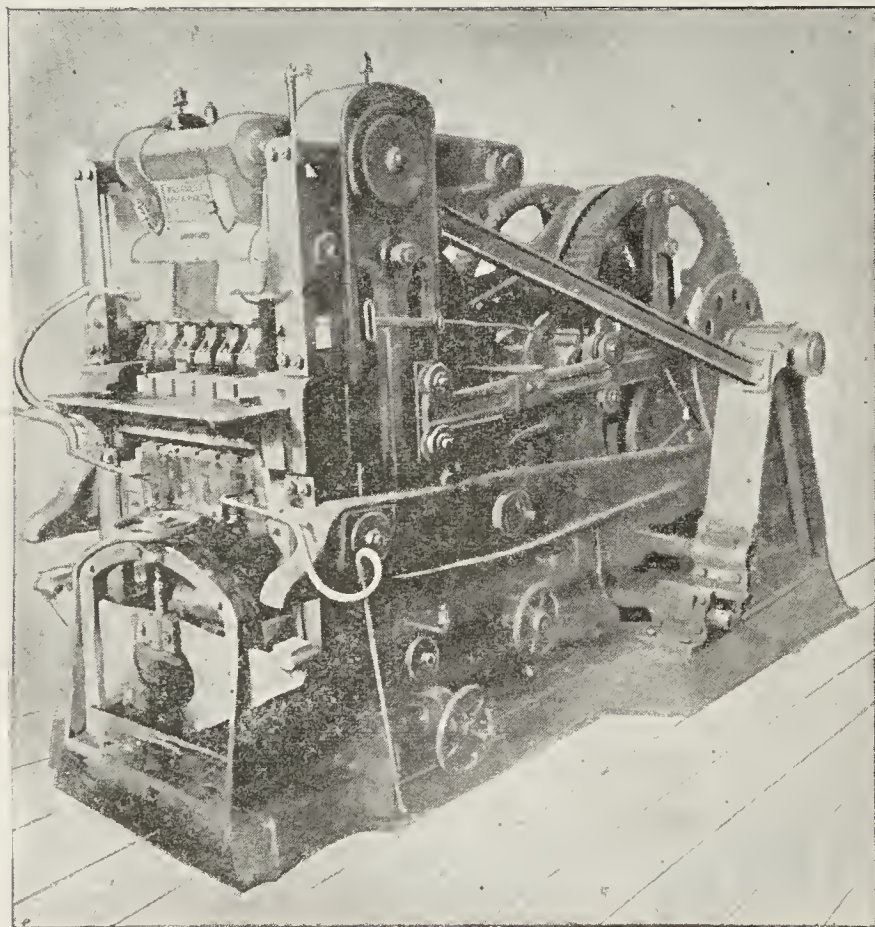
There is not time for anything except "business" just at present at the Dallas, Oregon, brick yard. One large kiln has already been burned, and another is just about ready to be fired. The brick is first-class in quality.

Another kiln has been fired at the Weston, Oregon, brick yard. The kiln has eighteen arches and contains over 350,000 brick.

The Tempe-Mesa Produce Co., at Tempe, Arizona, has begun the burning of 300,000 brick. About 12,000 a day will be turned out.

SUNSET.

The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION.

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,
920 Market Street, - - - ST. LOUIS, MO.

ARE YOU LOOKING FOR A

Steam Brick Dryer?

We have the Simplest, Cheapest and Best.

No Cars. No Tracks. No Fans. No Tunnels. No Brickwork.

Will dry your Bricks in 12 hours. For particulars, address

Martin Dryer Co.,
P. O. Box 87. LANCASTER, PENN.

The Best Brick Drier



Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS. Agent and Patentee, 161 Grand Street, Rahway, N. J.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in
United States, Canada
and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chenoa, Ill.



FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED—One good kiln setter and one good brancher. Address
SAN ANTONIO SEWER PIPE & MFG. CO.,
103 d San Antonio, Texas.

WANTED—Position as superintendent. Chambers Bros. machine preferred. Ten years experience. Salary moderate to commence.
101 em THOMAS, care Clay-Worker.

WANTED—Management of a dry press or still mud brick works by a thorough and reliable brickmaker. Address
101 td KEYSTONE, care Clay-Worker.

WANTED—Situation as a first-class burner or superintendent; can give the best of references as to ability, etc. Address
101 e TERRE HAUTE, care Clay-Worker.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address
101 d F. B. care Clay-Worker.

WANTED—Good business man with \$7,000 to \$10,000, as business and financial manager. Practical knowledge of business not necessary. A rare opportunity. Investigation solicited.
101 d W. E. HELMICK & CO., Zanesville, O.

WANTED—Situation as maker of enamelled brick, bath tubs, sinks and glazed terra cotta. Excellent reference. Twelve months present position. Reference from present employer. Specimens forwarded on application. Address
101 em ENAMEL, care Clay-Worker.

WANTED SALESMAN—Young man who is a hustler, one who has knowledge of brick machinery, preferred, and had experience as a salesman. Give experience and salary expected. A good position to the right man. Address,
101 d H. M. C., care Clay-Worker.

WANTED—An enamel brick maker who has some capital, to take an interest in an enamel brick plant located handy to the New York market. A splendid opening for a man who thoroughly understands the process of manufacturing. References required. Address,
101 d TIBAND, care Clay-Worker.

BUFF CLAY WANTED.

A large bed of first-class buff burning clay, located on or near Lake Michigan or Lake Superior, is wanted by an extensive manufacturer of clay ware. A good price will be paid for desirable property. Give location of clay and quote price before sending sample. Address,
101 d SCULPTOR, care Clay-Worker.

FOR SALE, CHEAP.

Two four-mold Johnson semi-dry press brick machines and four represses. Used six months. Duplicates of this machinery can be seen working at the Christy Fire Clay Co's. Works, St. Louis, Mo. Reason for selling, not suitable for manufacturing vitrified paving brick. Address,
103 d THE BARR CLAY CO., Streator, Ill.

FOR SALE.

A terra cotta plant located in Berlin, Conn. Good railroad accommodation, switch runs alongside of building and fitting shed. Brick building 100 x 50 feet, two stories high, of heavy construction, 1,500 square feet floor space. Dry floor 100 x 17 feet. Engine house 40 x 25 feet, 50 h. p. engine and 80 h. p. boiler; dry pan, Disintegrator and pug mill, 5,000 lb. elevator; two 14 ft. kilns and everything in first-class condition, ready to start at once.

All red clay can be had on the lot. There is also a shale ledge goes with the plant, of the finest quality. Would be pleased to furnish samples, either burned or in raw form. Plant is centrally located for the Eastern market, being 100 miles from New York and 130 miles from Boston, besides the surrounding towns would use more than could be turned out in this plant.

This plant will go very low and on reasonable terms, if sold before December 1st. It will pay any one to visit it. Address,

1015p M. H. DONNELLY, Pres.,
New Britain, Conn.

FOR SALE—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address **F. D. BROWN**, Room 13 Palmer House, Chicago, Ill.
3 t f d

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.
C. SIEDLER, Pres.
9 t f d 156 Fifth Ave., New York, N. Y.

WANTED—A party thoroughly experienced in the manufacture of brick from coal measure fire clays, mill brick, vitrified brick, pipe, etc., with some capital, to combine and form a company to work some veins of fire-clay in connection with a coal mine. Every advantage as to location and cheap production, and fuel. Clays and coal within 200 miles of Baltimore and Washington on B. & O. R. R. Address
E. COAL COMPANY,
93 c care Clay-Worker.

FOR SALE — Fire clay property and factory site; 2,500 acres within six miles of Baltimore, Md., a large part underlaid with clays of fine quality and great variety, suitable for making red, buff and other kinds of brick, tiles and terra cotta. Railroad through property connects it with Baltimore and Washington. Water connection with Baltimore and Chesapeake Bay by channel 15 feet deep. Good water power on property. Fine site for factories. Parts of property are suited for suburban development and parts for truck farming. For sale as a whole or in lots to suit, on reasonable terms. Also a small factory equipped for making roofing tiles and brick. Address
CURTIS CREEK M. F. & M. CO.,
56 cm 12 St. Paul St., Baltimore, Md.

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
6 spring brick trucks.
Lot shafting, belting and pulleys.
1 Barr Pumping Company steam pump.
All new or little used, and in excellent condition.
WALNUT,
4 t f d Care Clay-Worker.

FOR SALE CHEAP.

One second-hand, double die Columbian Repress; practically as good as new.
One Quaker Horse-power Brick Machine, in good order.
One Ten Horse Power Portable Engine, in good order. **THE HORTON MFG. CO.,**
1 t f l Painesville, O.

FOR SALE.

Two 8-foot dry grinding pans, under gear pan.
One 8-foot, under geared, iron frame wet for wood work.
One new 5-foot wet pan for wood frame.
One Potts stock brick machine.
One Potts sanding machine.
One 7-foot horizontal pug mill.
Two vertical pug mills.
Large lot of steel and iron, pallets.
Twenty pallet cars.
One 30 H.-P. horizontal tubular boiler.
Lot of boilers, tanks, etc.
THOMAS CARLIN'S SONS.
11 12 c Allegheny, Pa.

FOR SALE. A BARGAIN.

I have about 225 acres, 100 of which is clay suitable for the finest brick, both red and buff, runs 25 feet above navigable water on which it fronts 500 yards. Newport News, Norfolk, Portsmouth and Hampton, and Fortress Monroe all terminal of railroads reaching to every section of the country and which are rapidly forging to the front, use 100 or more millions of brick a year and are distant about 35 miles. The soil or clay on all the water routes is quite sandy and unfit for making the finest grade of brick, for which my clay is especially suited. There is also a large demand among the truckers around Norfolk for tile which they have to get elsewhere. There is no clay in Virginia better for that purpose than mine. I have a large brick mill supplied with water from an unfailing pond. House 30 by 60, three stories and an annex 24 by 40, two stories; dwelling house, kitchen, out houses of every description, barns, stables, quarters for hired hands, etc. 50 or 60 acres of land cleared, balance heavily timbered. Wood costs at kiln \$1.50 per cord, labor 50 to 75 cents per day. Lumber \$8 per M, transportation \$1 per M. I will take for the entire property, all of which is in excellent order \$6,000—\$2,000 cash and balance in five annual installments, with interest at six per cent. The cleared land is in excellent state of cultivation all in growing crops. The property lies on the James River. Address
91 c **JONES,** care Clay-Worker.

FOR SALE.—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address,
1 t f d **JESSE T. MORGAN,** Wilkes-Barre, Pa.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.

T. W. CARMICHAEL,
Inventor and Manufacturer,
Clarksburg, W. Va.
6 t f d

FOR SALE CHEAP.—One Second-hand, double die Columbian Repress; practically as good as new.

One Quaker Horse-power Brick Machine, in good order.

One Monarch Brick Machine, only used one short season. All in running order.

THE HORTON MFG. CO.,
1 t f l Painesville, Ohio.

FOR SALE, DRY PRESSES.

I have two Simpson Dry Presses, that are just as good as new, that I will sell for \$1,500 each, F. O. B., Cleveland, Ohio. These presses cost \$3,500 each. **FRANK B. MANY,**
809 Cuyahoga Bldg., Cleveland, Ohio.

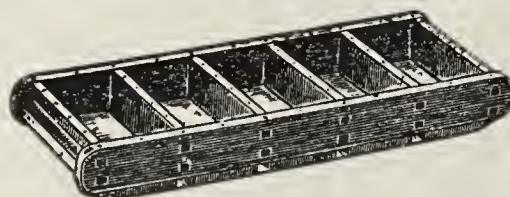
G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and....

MACHINE

MOULDS



We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

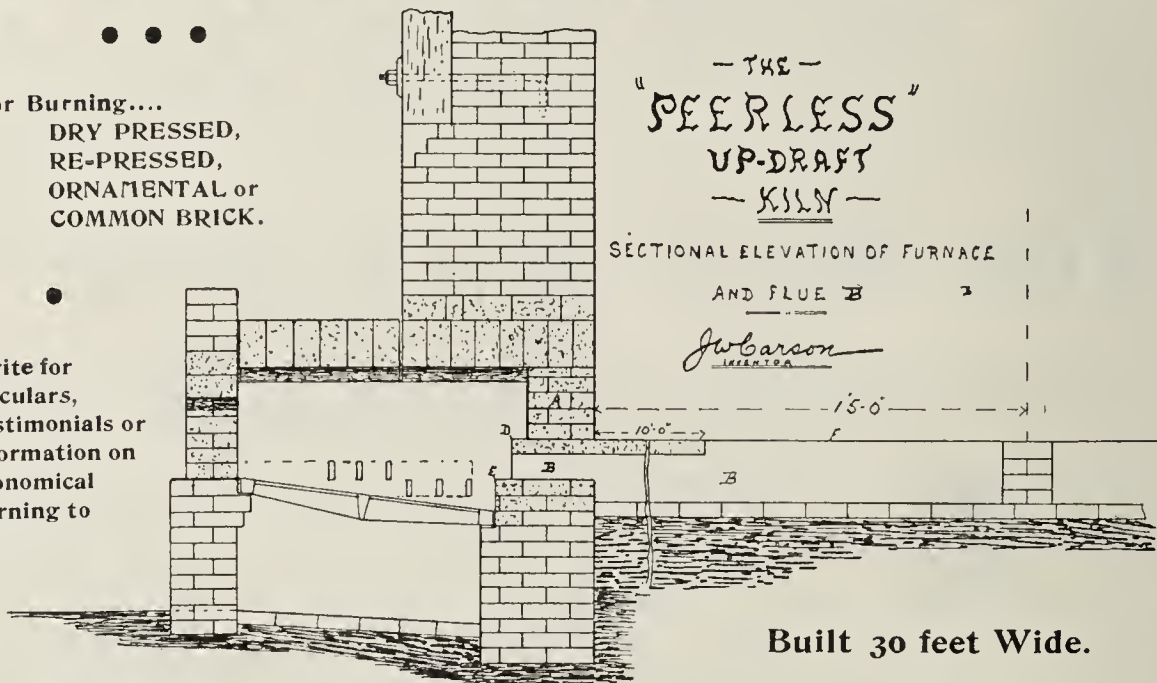
No. 829 Sixth St., Milwaukee, Wis.

The "PEERLESS" UP=DRAFTKILN.

For Burning....

DRY PRESSED,
RE-PRESSED,
ORNAMENTAL or
COMMON BRICK.

Write for
Circulars,
Testimonials or
Information on
Economical
Burning to



Built 30 feet Wide.

J. W. CARSON, LaPrairie, P. Q., Can.

IF YOU
NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.

Get good Pallets from those who know how to make them. It will pay you in the long run.
Send for circulars and prices.

W. B. MERSHON & CO.,

Saginaw, East Side Mich.

No Dry Press Brick Plant Complete

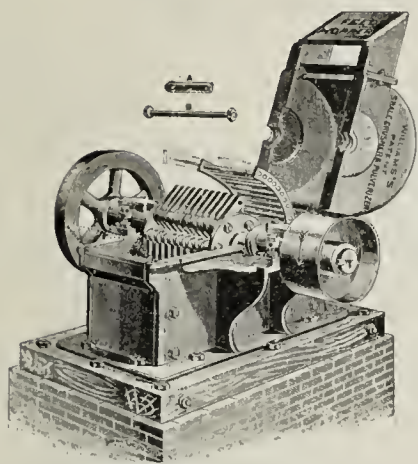
..... WITHOUT

The Carmichael CLAY STEAMER.

T. W. CARMICHAEL, Manufacturer, Wellsburg, W. Va.

Williams's Combined Shale Crusher and Clay Pulverizer,

A Clay Pulverizer of Wonderful Capacity:



WILLIAMS'S SHALE AND CLAY PULVERIZER, with Clay Steamer Attached.

M. F. WILLIAMS & CO.,
2705 N. Broadway, City.

GENTLEMEN:—In reference to the No. 3 Pulverizer which we purchased of you last winter, and have had in operation since the latter part of February, almost continuously. My son Warren, under whose advice and recommendation it was put in, has this to say concerning same: "The Williams Pulverizer is doing its work with entire satisfaction—it prepares clay for three machines; each making 22,000 common brick in a day of 10 hours. Speaking in the vernacular—'It has a cinch.'"

ANTHONY ITTNER.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

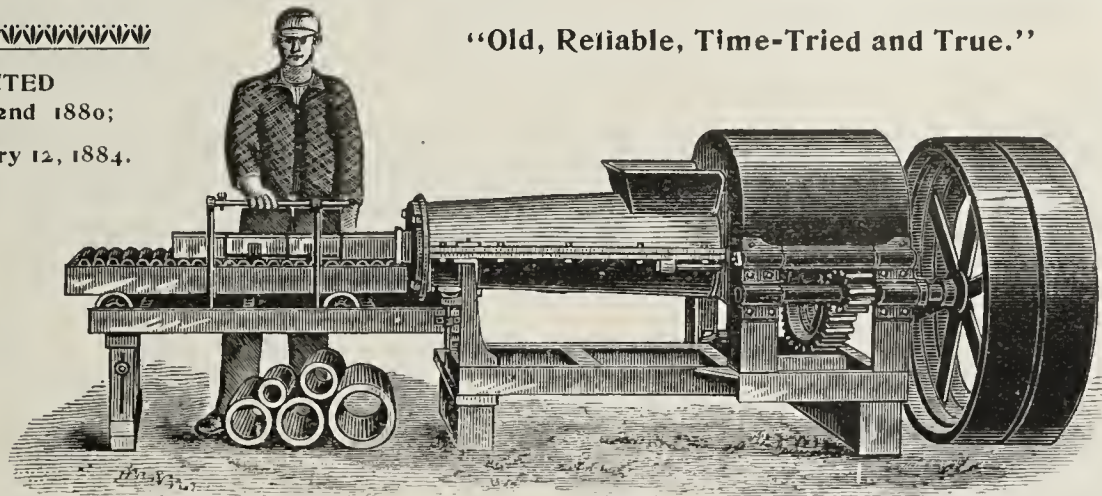
2705 North Broadway, St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

PATENTED

June 22nd 1880;
and
February 12, 1884.



[P. H. Kells, the Original Inventor of the Auger Machine.]

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

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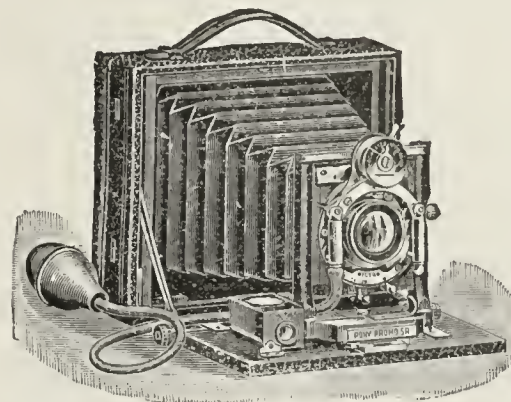
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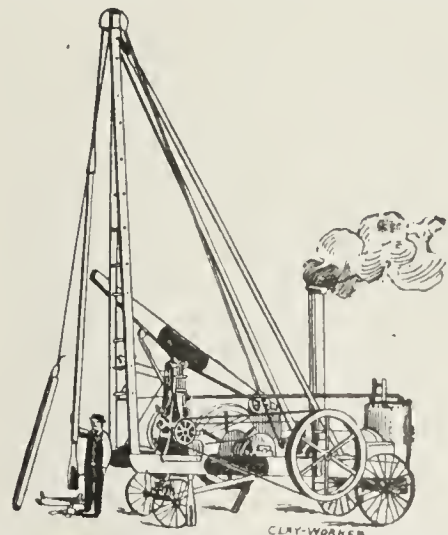
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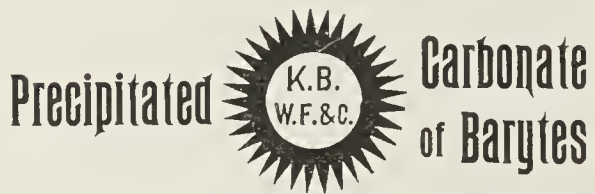
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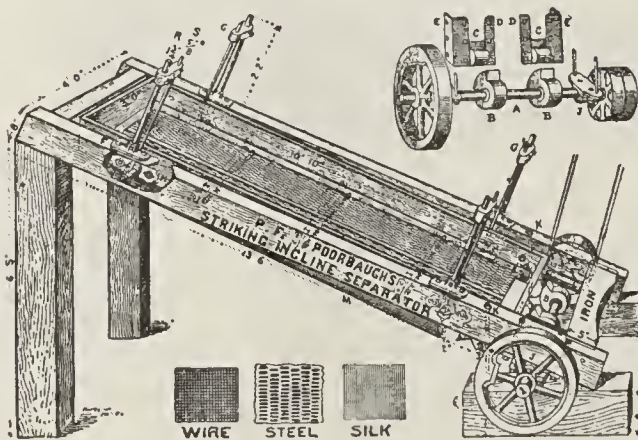
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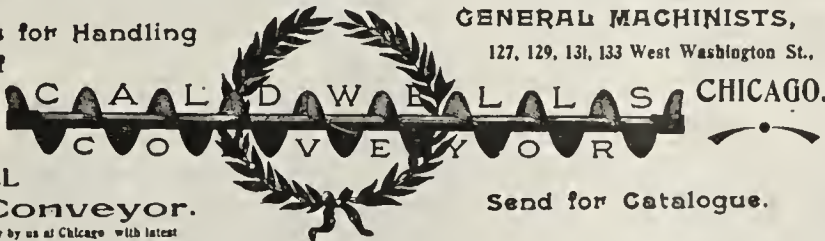
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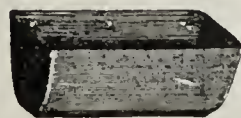
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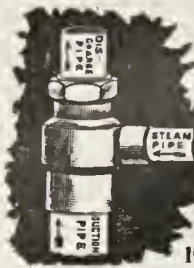
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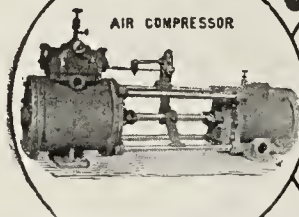
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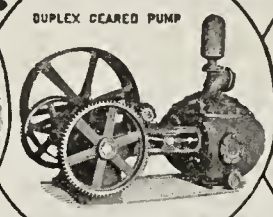
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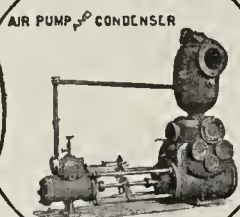
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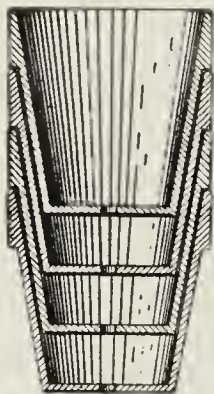
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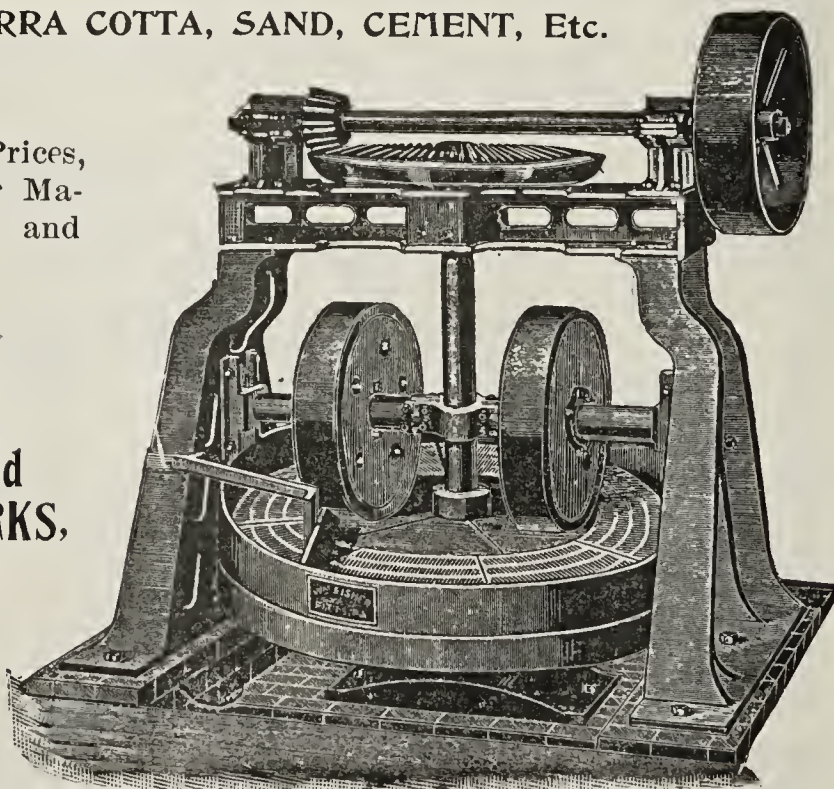
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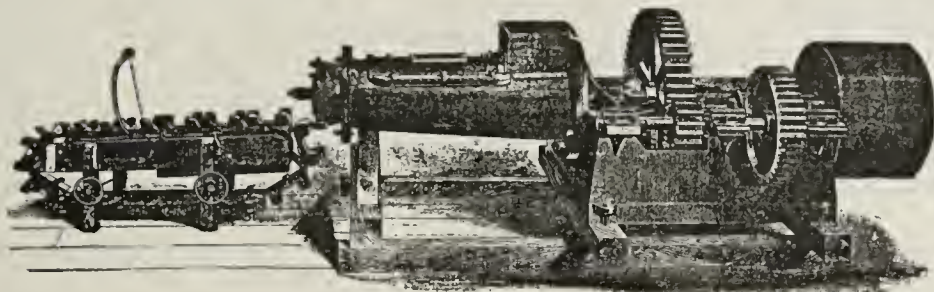


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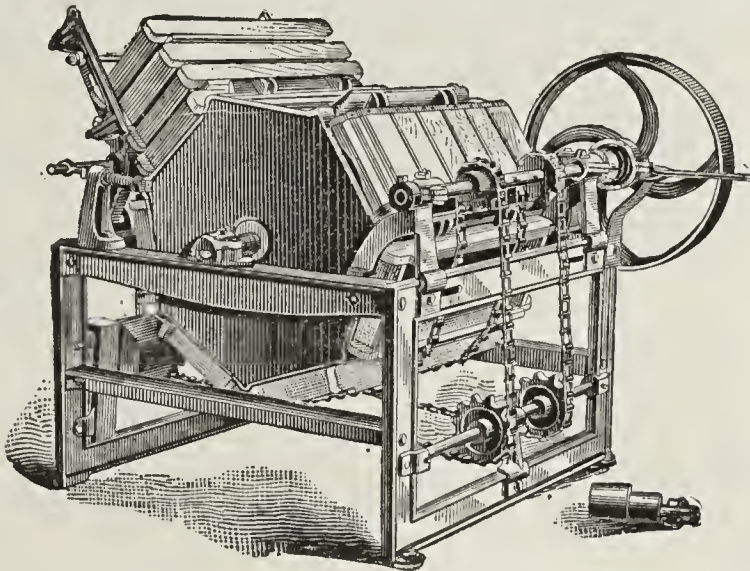
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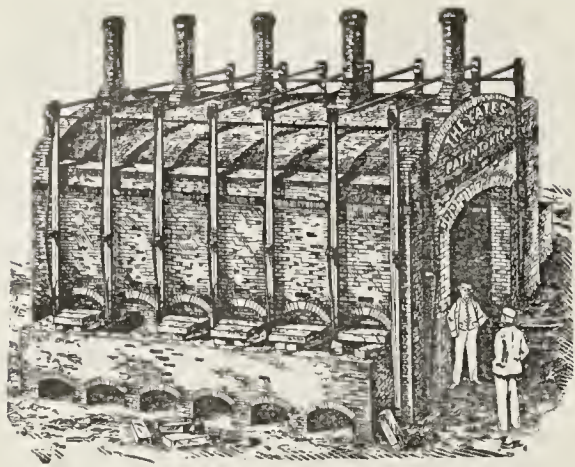
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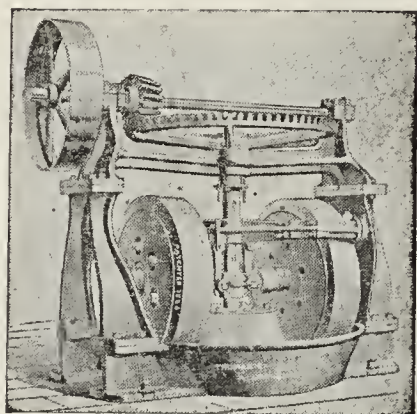
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THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



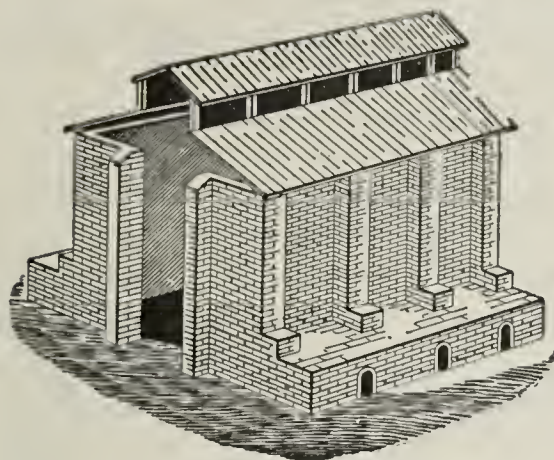
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Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

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Up-Draft Kiln.

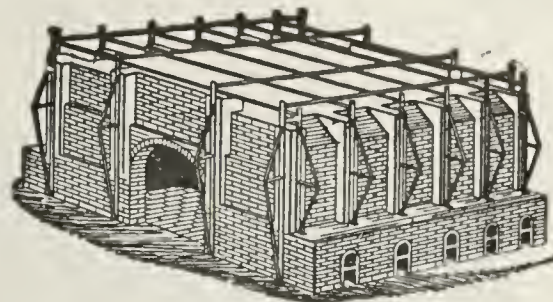
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Investigate and be convinced.

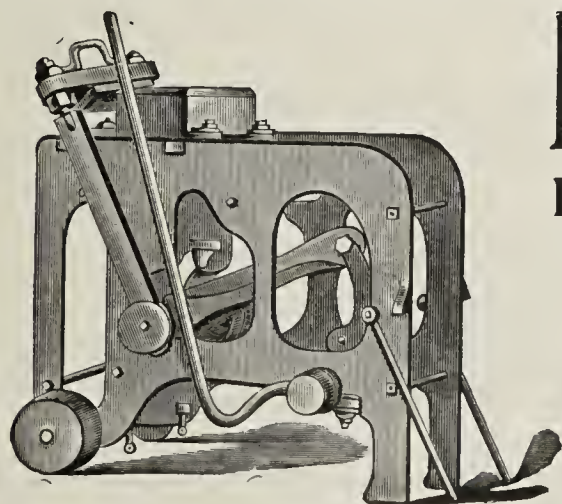
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

Days Brick Works.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

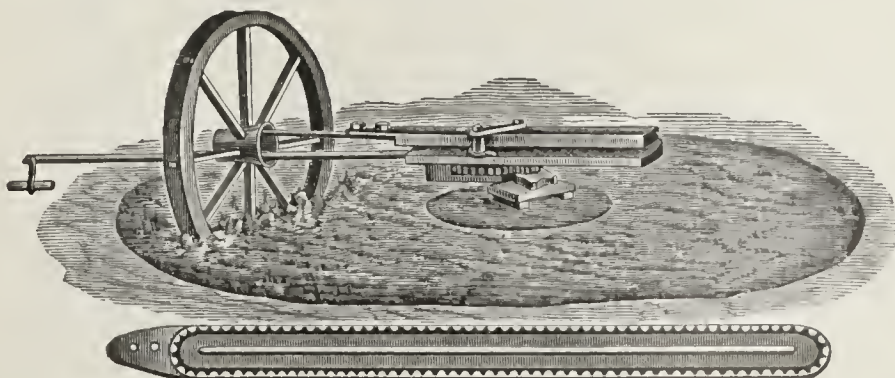
Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



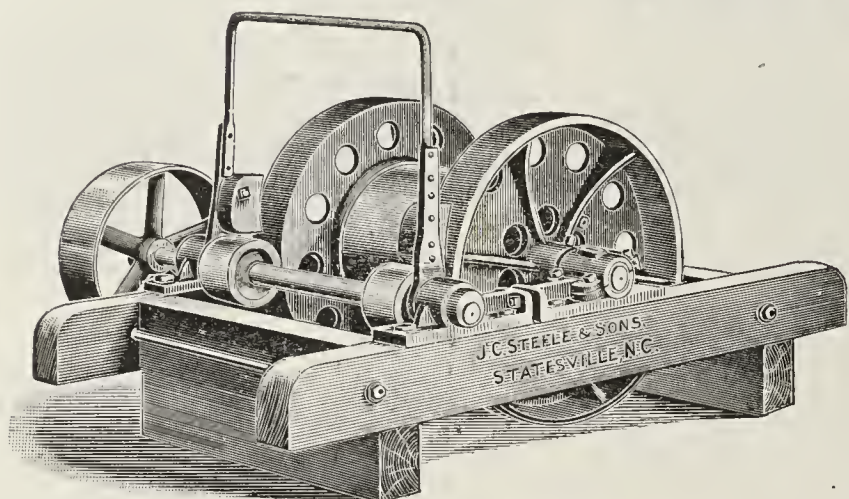
These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.

The 'New South' Brick Machinery

Manufactured by

J. C. STEELE & SONS,
Statesville, N. C.



New Double Friction Winding Drum.

Twenty-four outfits of Brick Machinery sold in six months, besides many of our new Double Friction Winding Drums (of which cut is here shown,) and lots of our Iron Frame Revolving Clay Cars, not to mention Brick Trucks, Automatic Cutters and other Brickyard equipments.

Let us make your acquaintance.

J. C. STEELE & SON, Statesville, N. C.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,
Grassy Point, Rockland Co., N. Y.

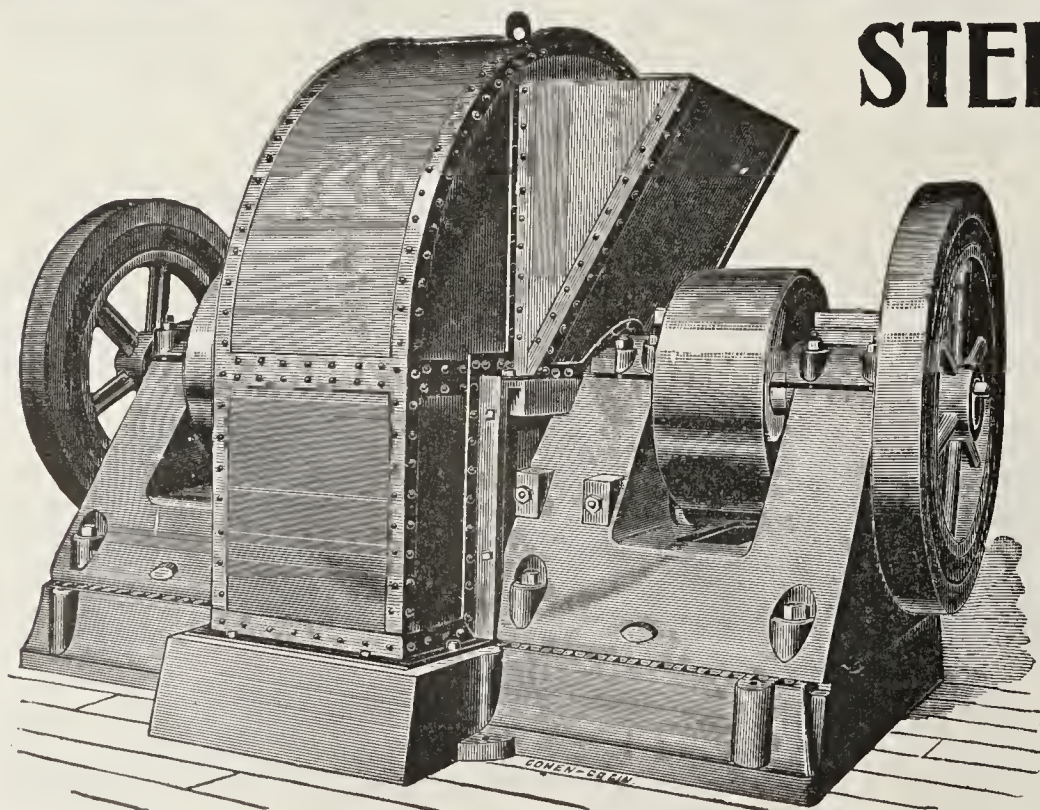
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

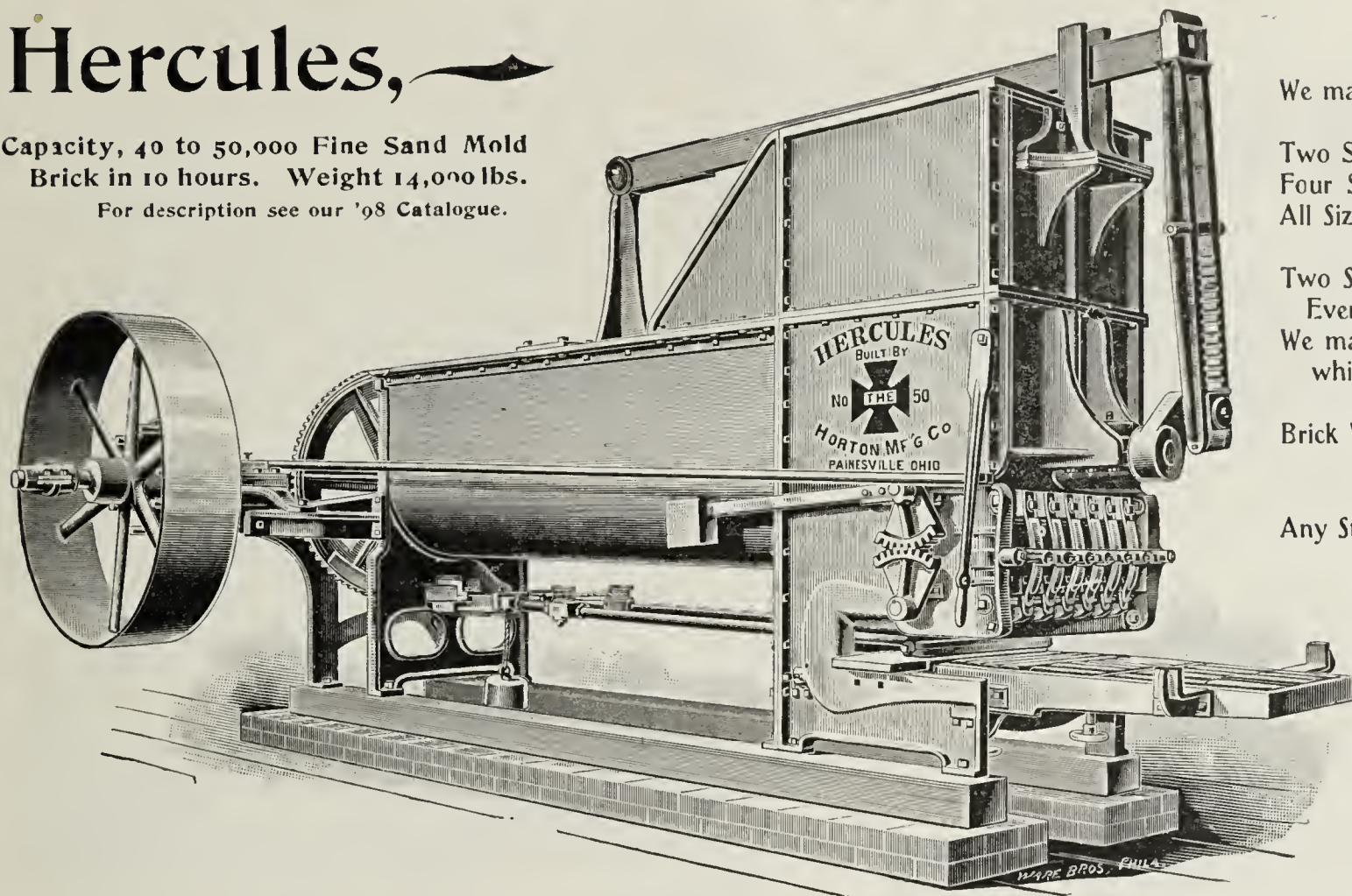
Stedman's Foundry & Machine Works,

Aurora, Ind.

Do You Want the Best Machine on Earth?

Hercules,

Capacity, 40 to 50,000 Fine Sand Mold
Brick in 10 hours. Weight 14,000 lbs.
For description see our '98 Catalogue.



We make Seven Styles
of Brick Machines.
Two Styles Mold Sanders.
Four Sizes of Disintegrators.
All Sizes of Pug Mills.
All Styles of Elevators.
Two Styles of Hoists.
Everything in Dump Cars.
We manufacture Molds,
which have no equal in
Quality and Price.
Brick Wagons.
Dump Tables.
Brick Pallets.
Any Style of Barrow
used on a Brick Yard.
Double and Single
Deck Pallet Trucks.
Kiln Grates, Doors
and Frames.
Shafting, Hangers,
Pulleys, Etc.
Boilers and
.... Engines.

The HORTON MANUFACTURING CO., Painesville, Ohio.



ON TOP!

That's Where We are With Our
.... Up-to-Date Machinery.

On Top with our new Berg Dry Press—it's a
World-beater.

On Top with our Paving Brick Machinery and
our Brick and Tile outfits.

On Top with our new Automatic Cutter.

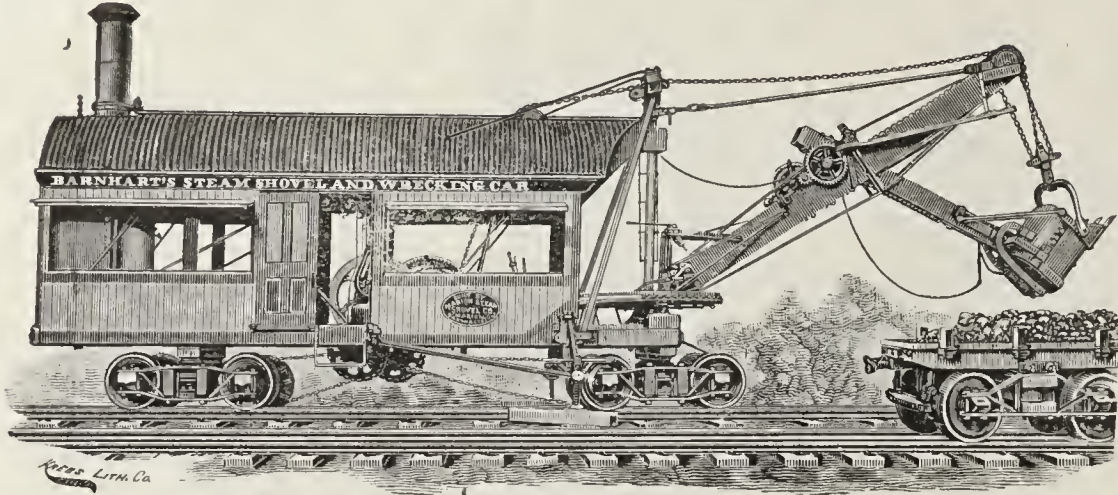
On Top with our Soft Mud Machinery.

ALWAYS ON TOP.

Send for Circulars. We can put you on Top too!

Chicago Brick Machinery Co., 225 Dearborn St.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

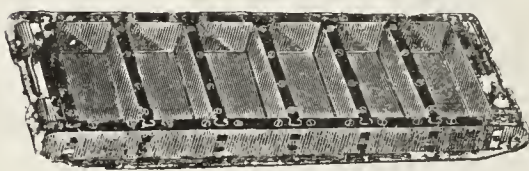
The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

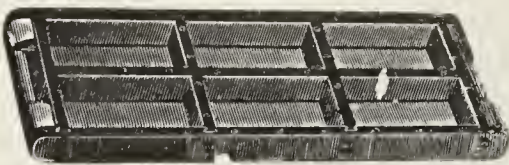


STYLE C—¾ YD.

Do YOU USE Arnold's Brick Moulds?



6 Brick Machine Mold.



6 Brick Hand Mold

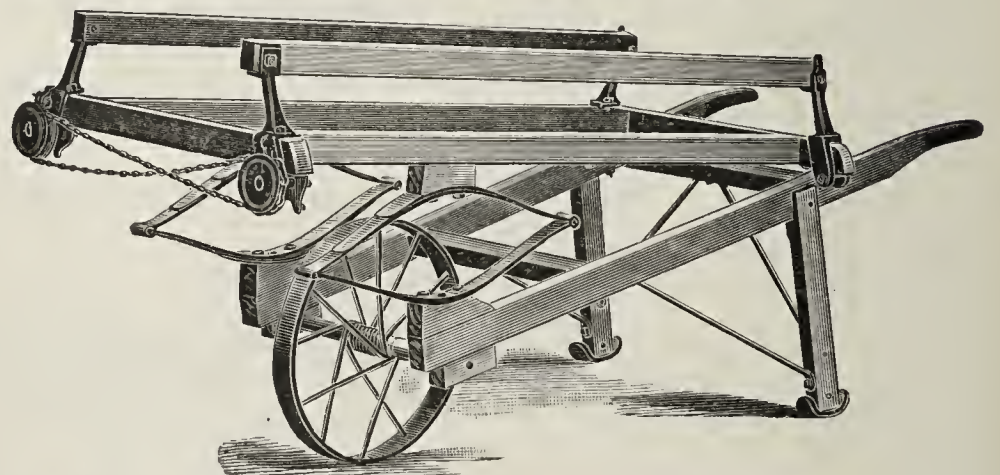


3 Brick Hand Mold.

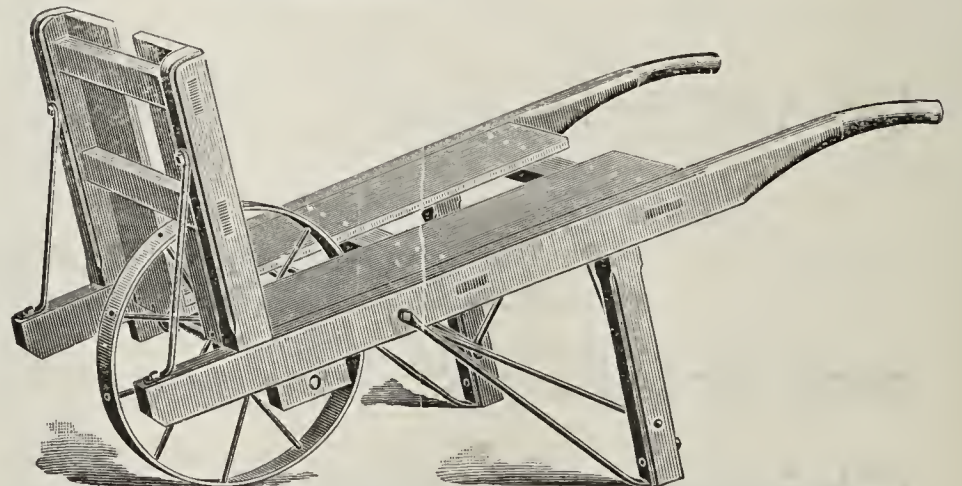
future delivery desired now. We make the best

You are missing a good thing if you are not. You must not expect \$10 a thousand for brick made in 10 cent moulds — or old worn out moulds. It is poor economy to use inferior moulds if you want to make brick to bring good prices, "don't you see!"

We are selling goods from a new price list for 1898. It will pay any brickmaker to let us know just what you will want and how much of it, so we can let you know what we will take for it. Orders for



No. 4 Pallet Truck.



No. 4 Brick Barrow. Price \$5.00
No. 3 Same Barrow on Springs, " 6.25 } For next 30 days.

➔ Moulds, Trucks
and Barrows,

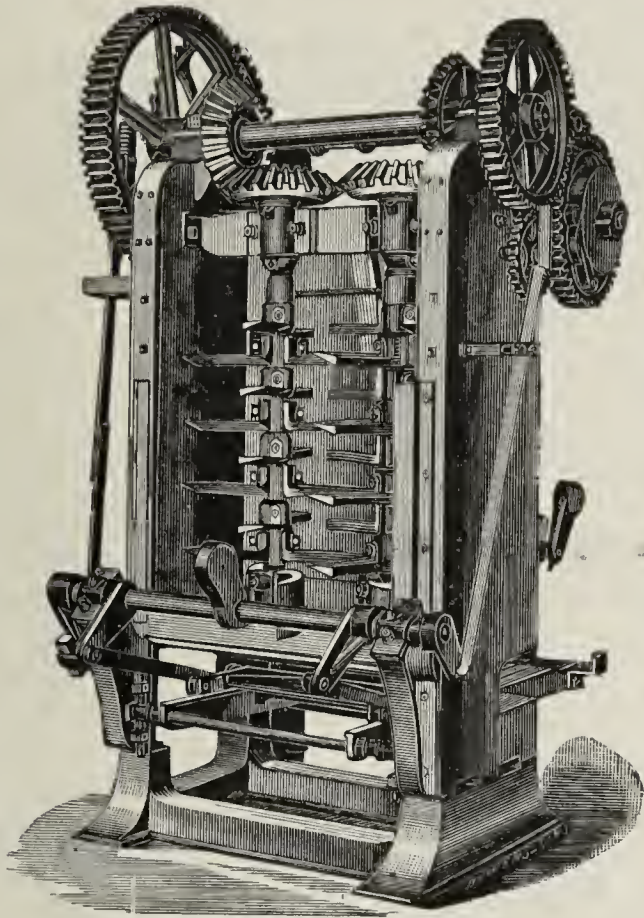
A great variety of them, and a lot of other things used on a Brickyard.

Send for Catalogue. Address

D. J. C. ARNOLD, New London, Ohio.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



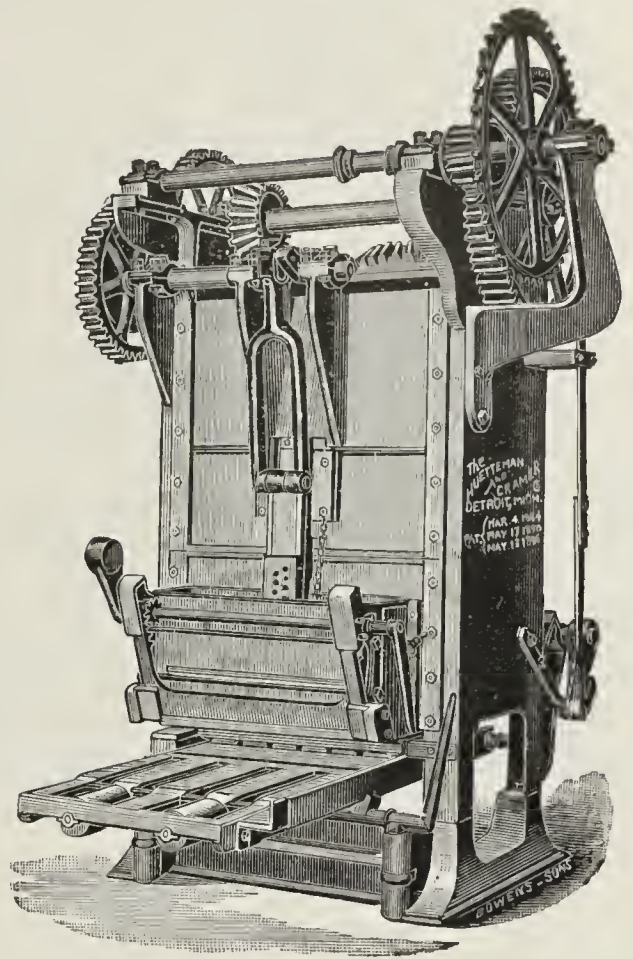
It is made entirely of iron and steel thus being very Strong and Durable. Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE
AND PRICES TO

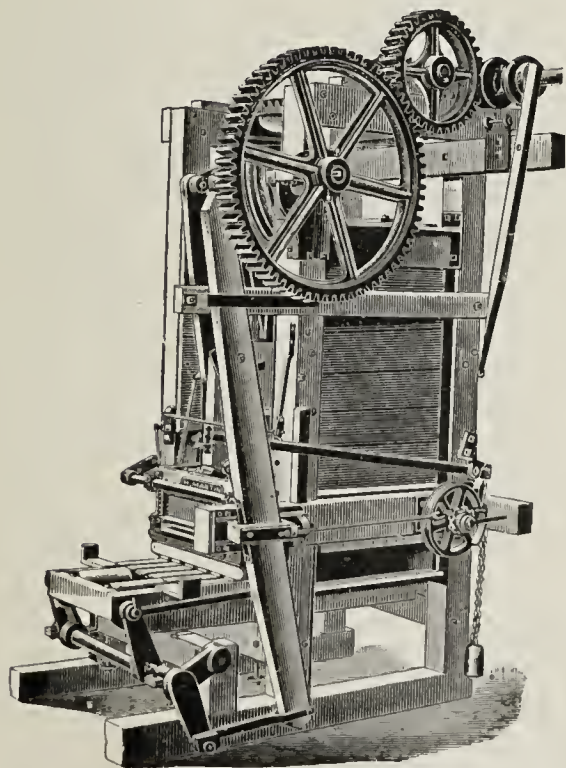
The Huetteman
& Cramer Co.,

Manufacturers of the Duplex Brick Machine and general outfit for
brickyards,

12, 14 & 16 Sherman St.,
DETROIT, - - MICH.



The Famous "Martin" Steam Power Brick Machines.



Their capacity depends entirely upon the facilities for feeding the machine and taking care of the brick when made.

They are not adapted to the manufacturer of

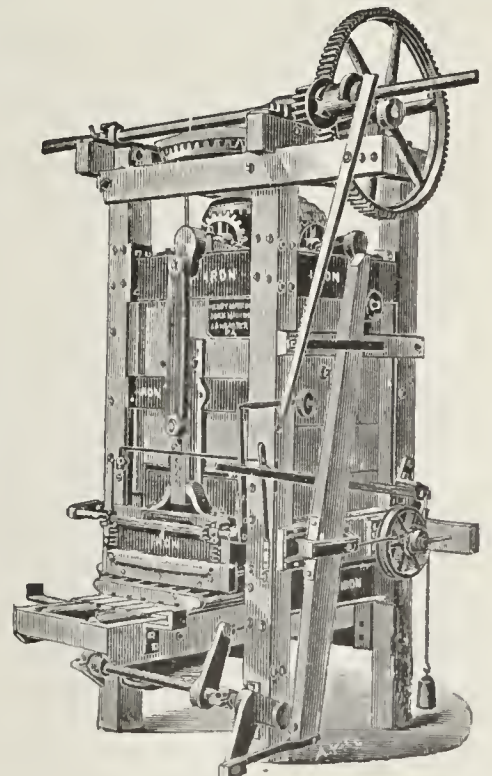
GOLD BRICK

From Sea-Water but are capable of turning out 50,000 first-class building brick in 10 hours from any kind of clay.

Their merits are well established.

The Henry Martin
Brick Machine Mfg. Co.,

Lancaster, Pa., U. S. A.

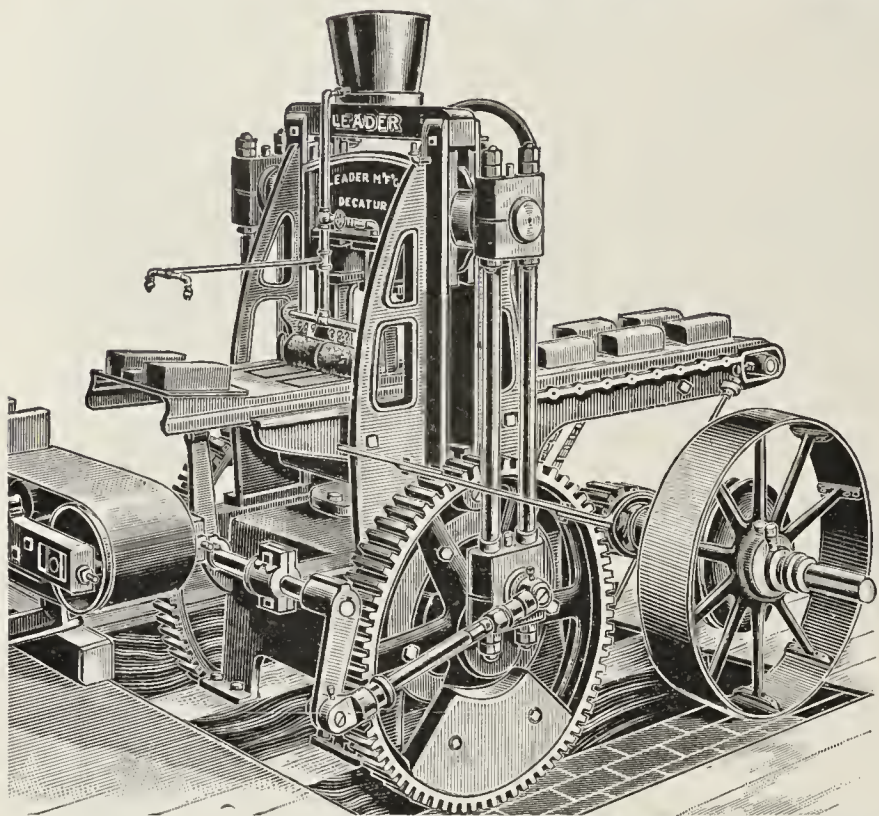


Send for Illustrated Catalogue.

CABLE ADDRESS "MARTIN LANCASTER"
LIEBERG CODE.

Leader Brick Machinery

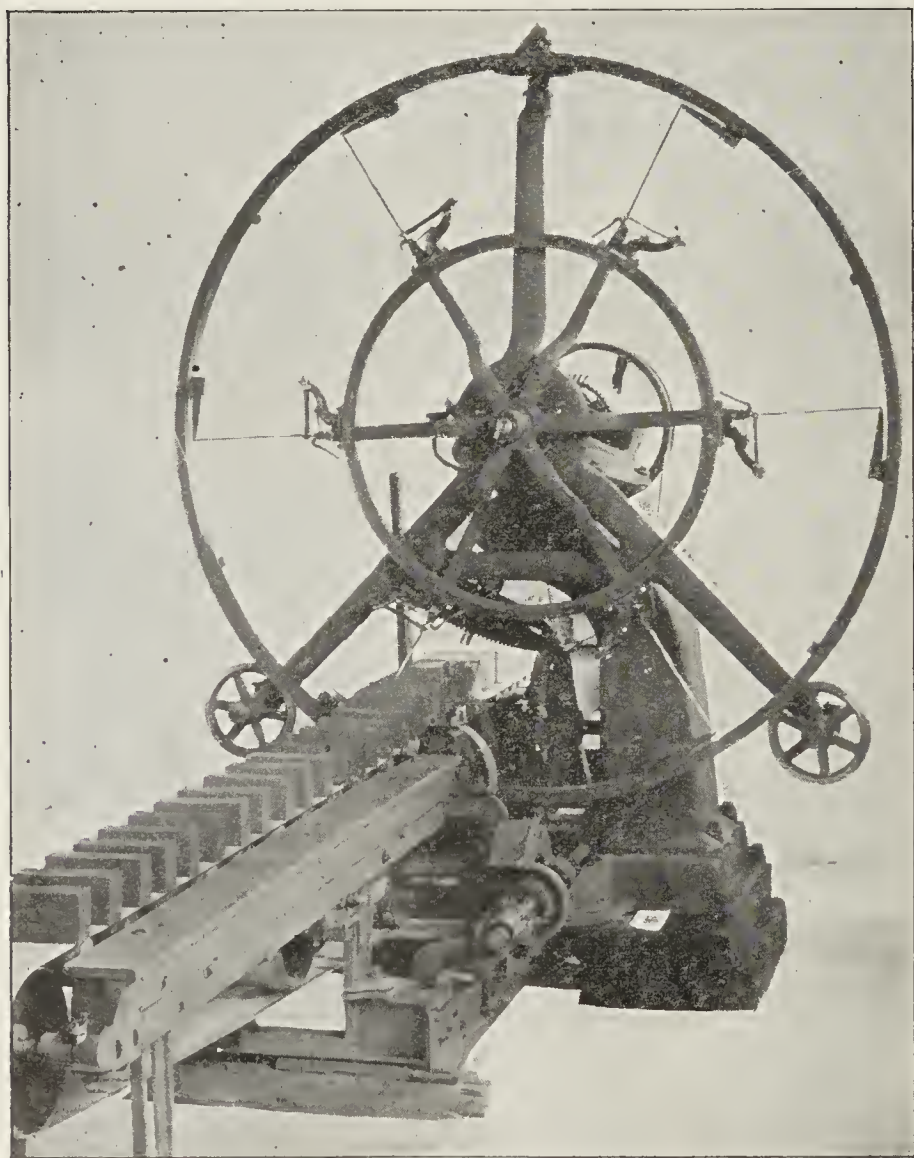
Is Not Surpassed.



Is cheaper in the Long Run
and Costs no More at the
Beginning than the other Kind.

The Leader Repress is a double die machine of liberal dimensions, simple, convenient, effective, durable and light running, and is fully described together with our brick machines in sectional Catalogue number 101, which will be mailed free to any address.

LEADER MANUFACTURING CO., Decatur, Ill.



The Chambers Automatic Side-Cutter.

Automatic Side-Cutter For Stiff-Tempered Brick Machines.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

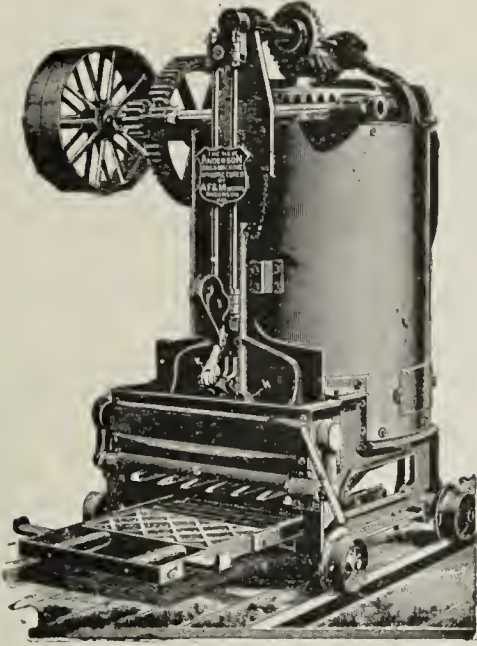
The machinery is above the dirt and all gearing encased.

MANUFACTURED and
GUARANTEED. . . .

Chambers Brothers Co.,
PHILADELPHIA, PA.

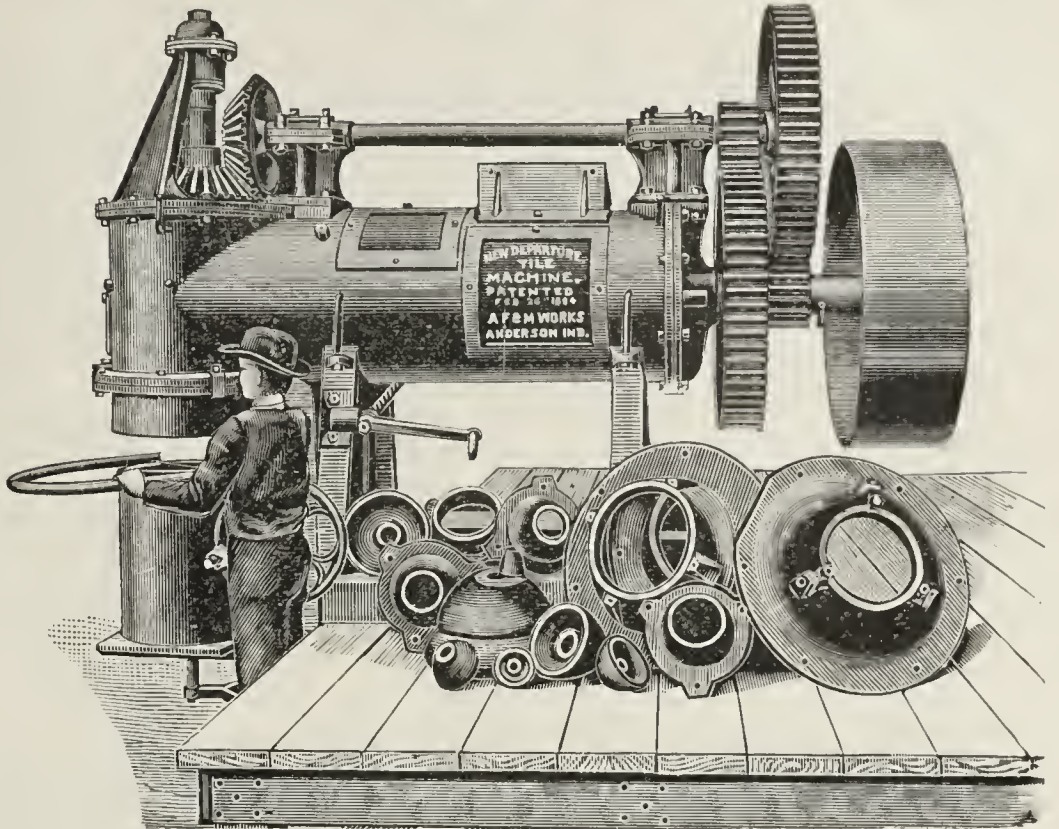
New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS.

Anderson, Indiana

The Past and
the Future



In the Past

Cutting
BICYCLES.

Have given universal satisfaction.
In the Future we agree to protect you by our liberal guarantee.
Six models to select from \$35, \$45, \$60.
We refer by permission to the editor of the CLAY-WORKER.
Get our Catalogue.
These wheels are fitted with gear cases and the Willits Rear Hub Brake.

A full line of Cycle Sundries.

Get our Sundry Catalogue.

HAY & WILLITS MFG. CO.

West 18th St. and Belt Railroad, INDIANAPOLIS, IND.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.

Horseheads Brick Co., N. Y., August 13, 1898.

Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

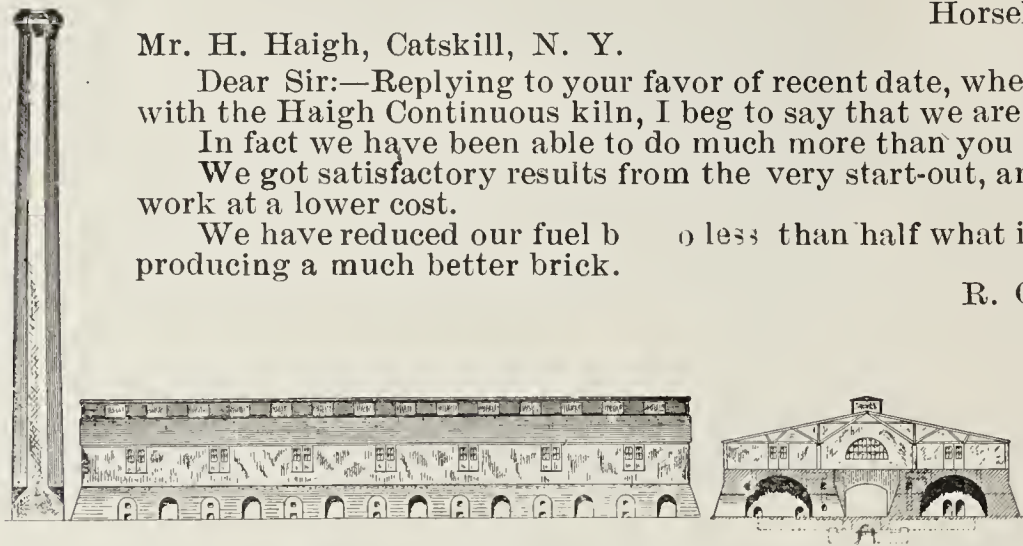
We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bill to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,

R. G. EISENHART, Treas. and Gen. Man.

This kiln has now been in operation nearly two years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at \$2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.



Address **H. HAIGH, Catskill, N. Y.**

The Lehmann ^{Portable} _{Continuous} Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

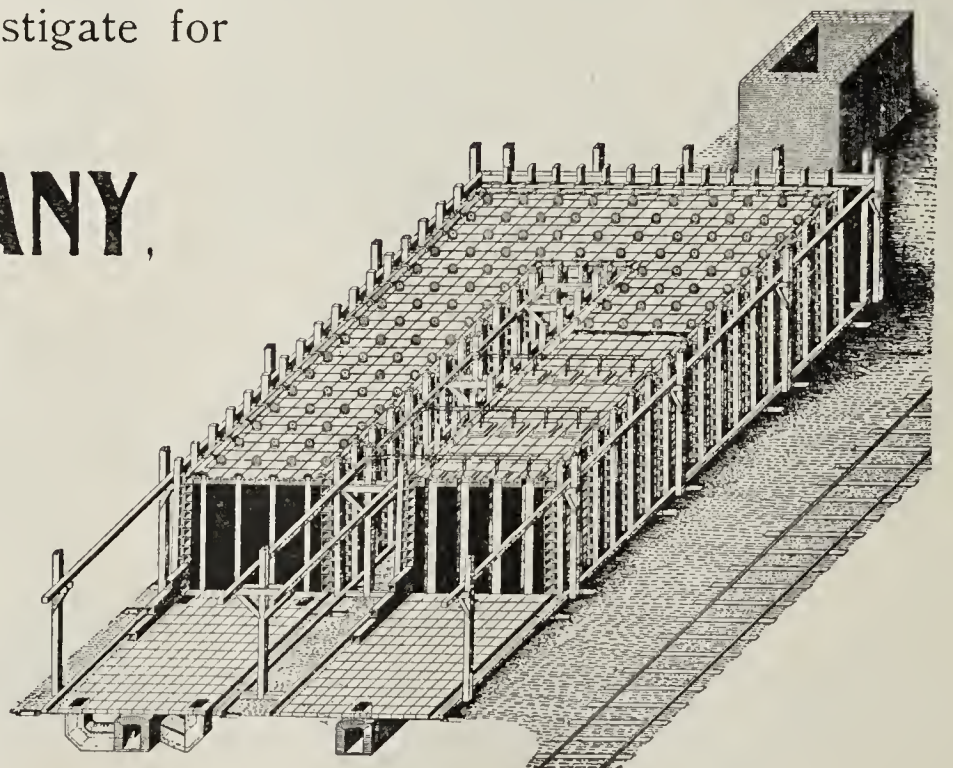
F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,
Plans and estimates furnished for Brick, Lime and
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has
been in successful operation with crude
oil during the last year and can be adapted
to all kinds of fuel.



Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

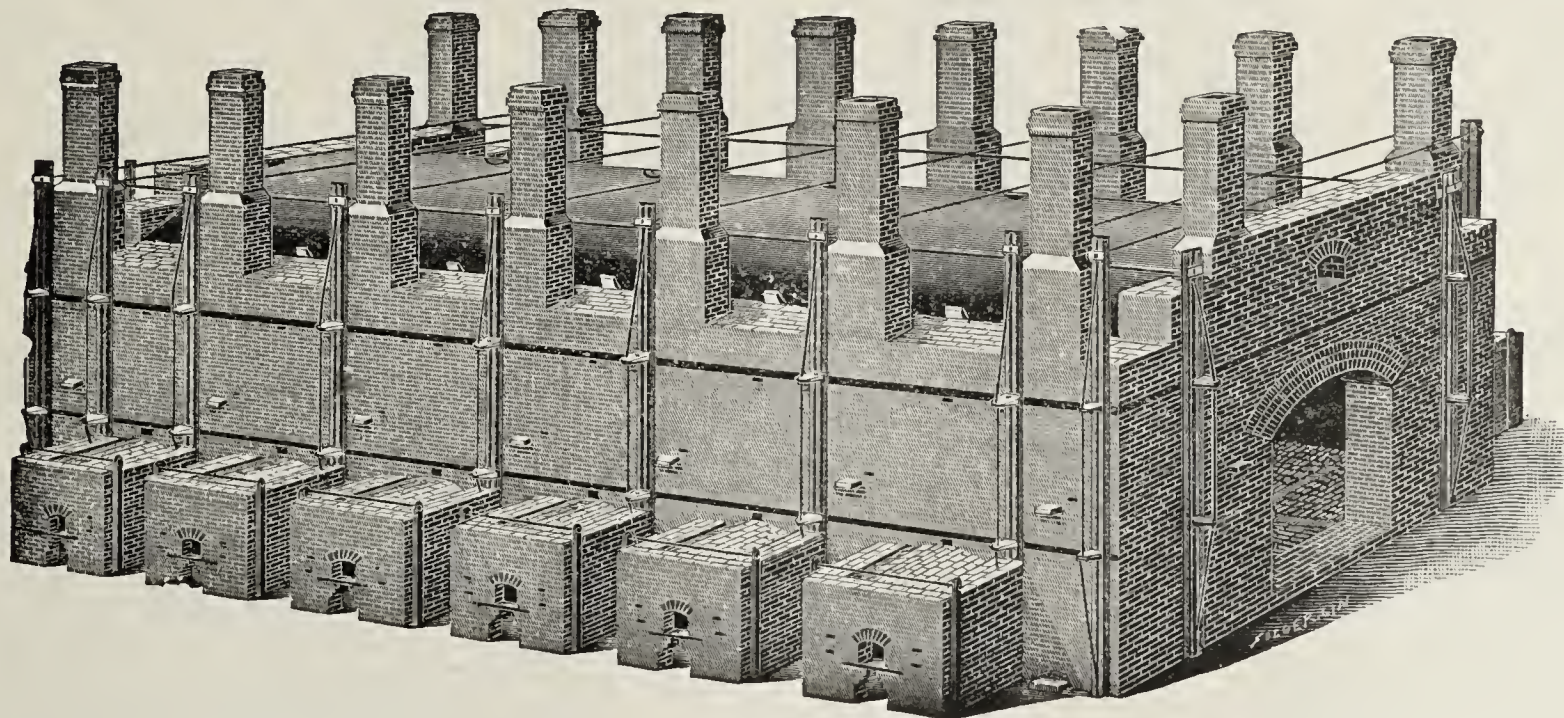
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.

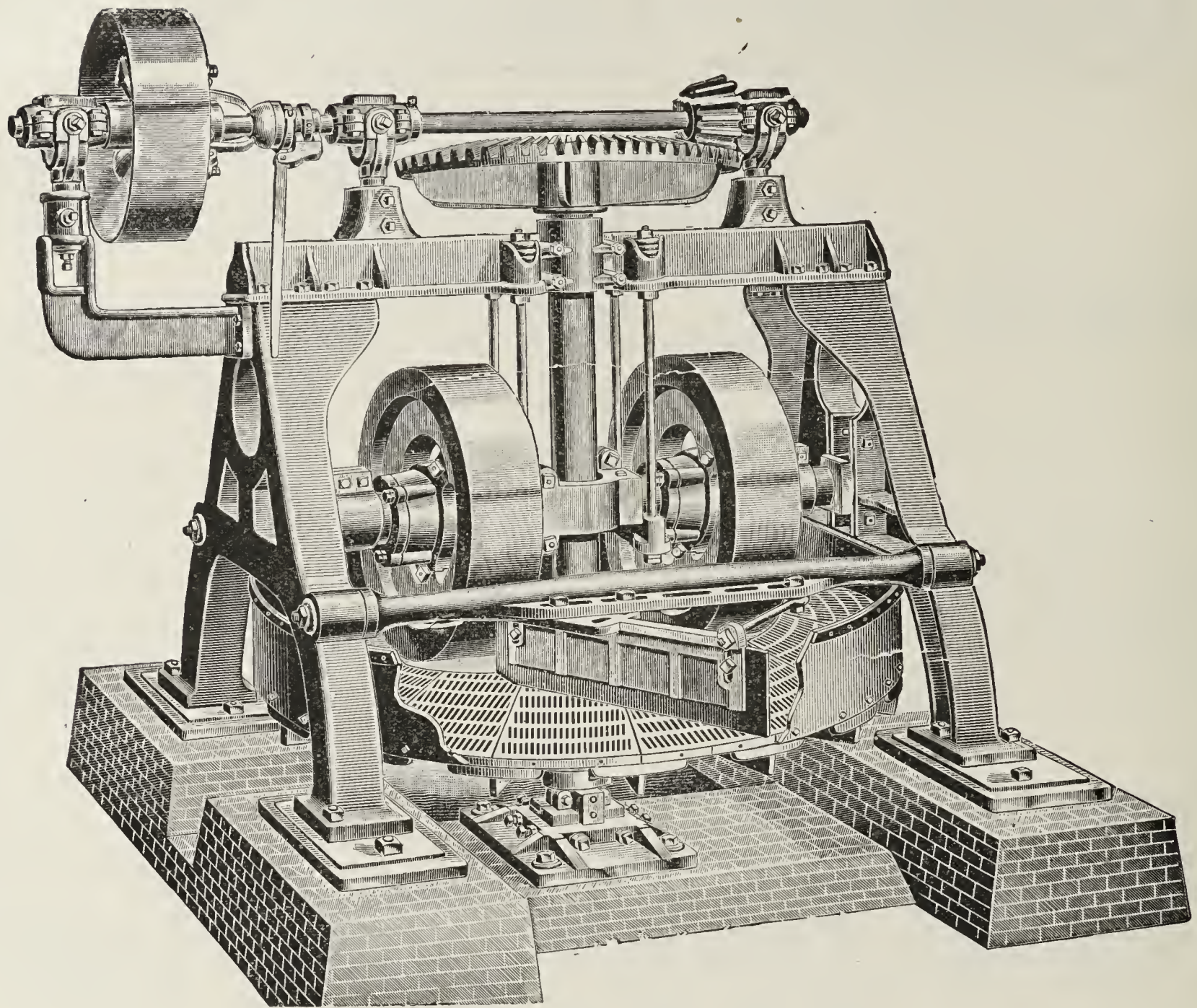


A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

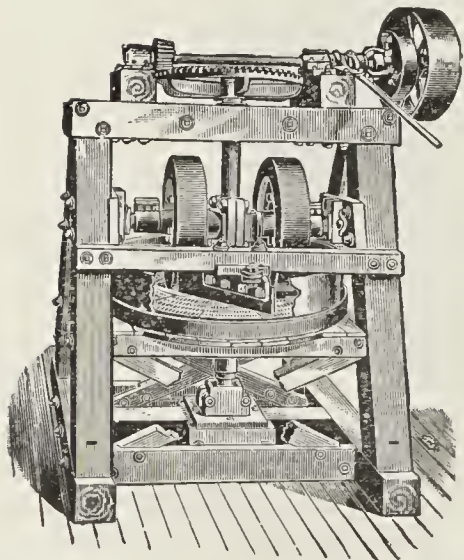
The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



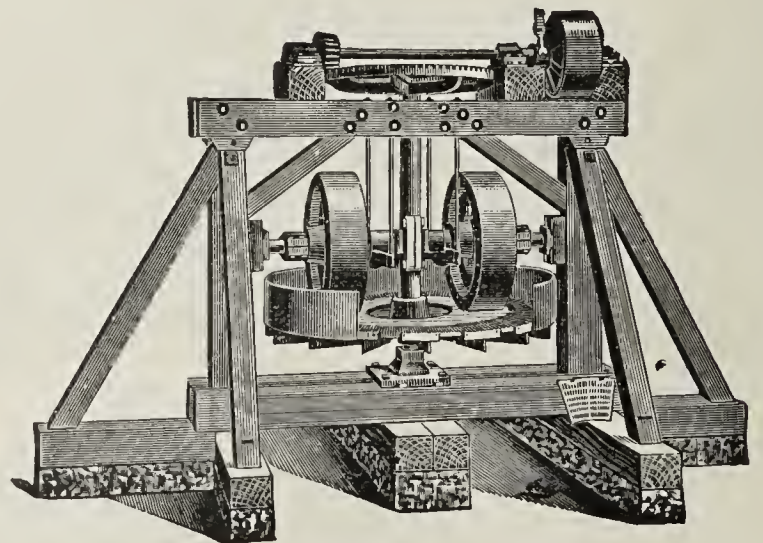
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
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.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
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OUR SPECIALTY IS

Sewer Pipe Machinery.

We are . . .
Authority on

DIES.

Write us
For
Pottery
Machinery.

Latest
Improved

Greatest Capacity,
Lightest Running

DRY and WET
PANS

WITH

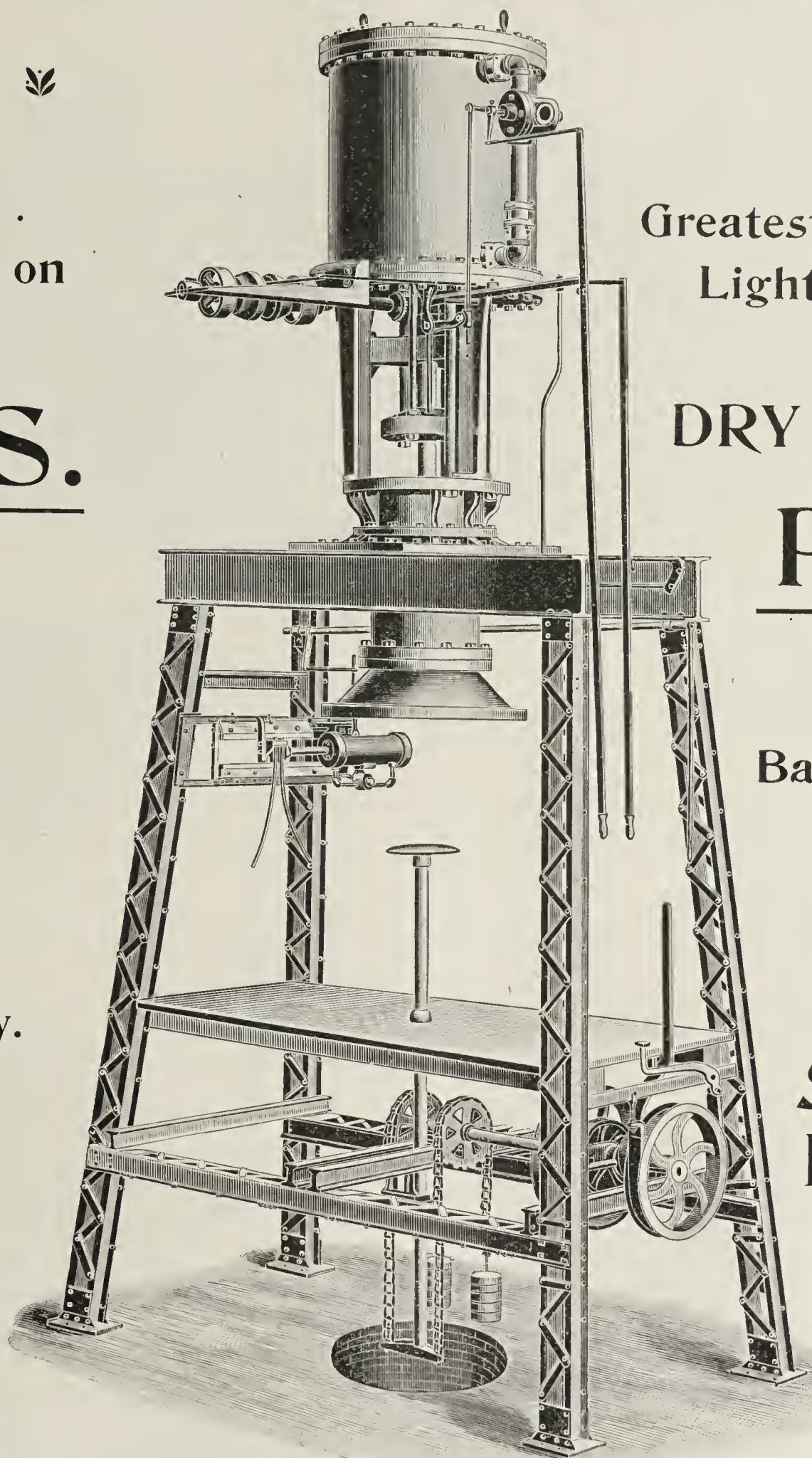
Ball Bearing

STEP

AND

STEEL
FRAMES.

Write us
for Catalog.

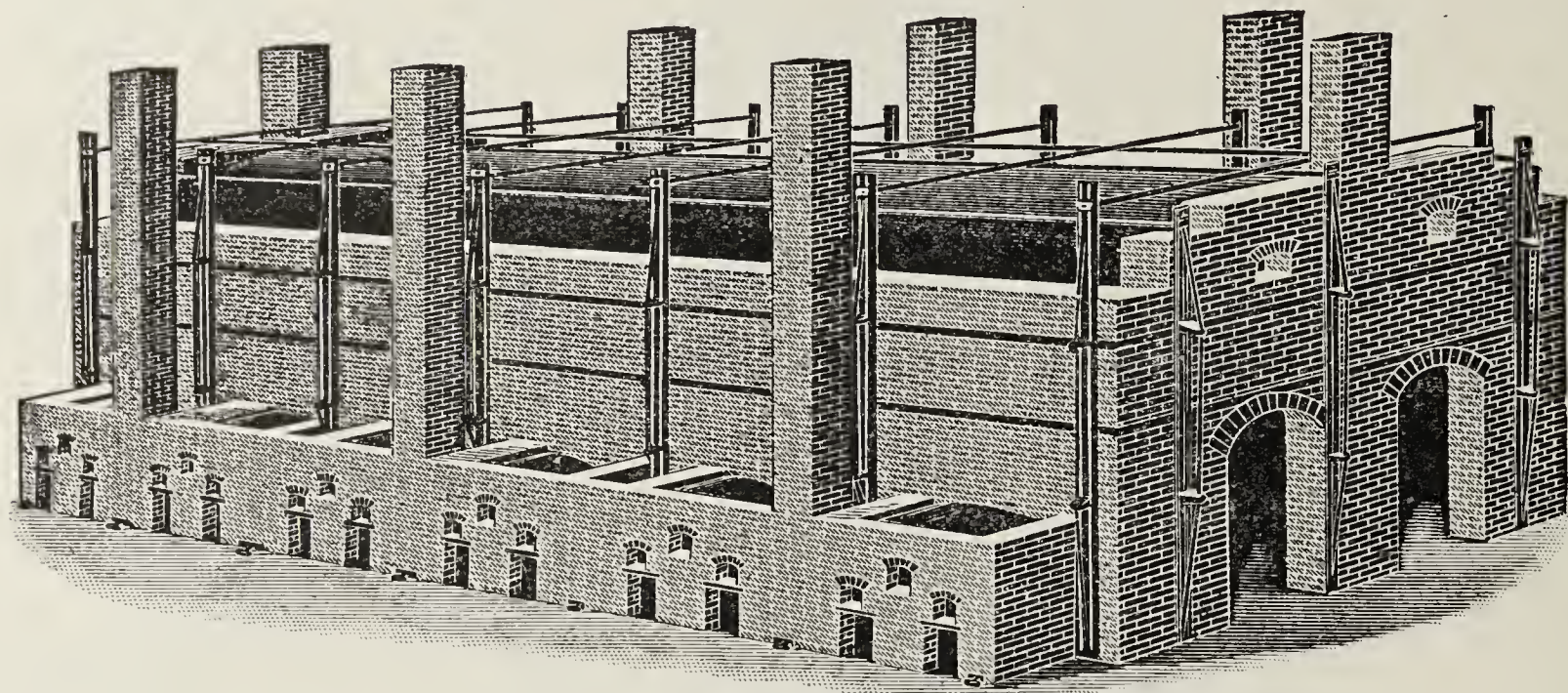


SEWER PIPE AND TILE PRESS,

MANUFACTURED BY

TAPLIN, RICE & CO., AKRON,
...OHIO.

“One of the Greatest Inventions of Modern Times.” F. W. BUTTERWORTH,
Asst. Gen'l Man. Marion Brick Works.



The Swift SLACK COAL COKING-TABLE Furnace Kiln.

THE KILN which has a solid bottom, which is much cheaper to begin with, and is always in repair.

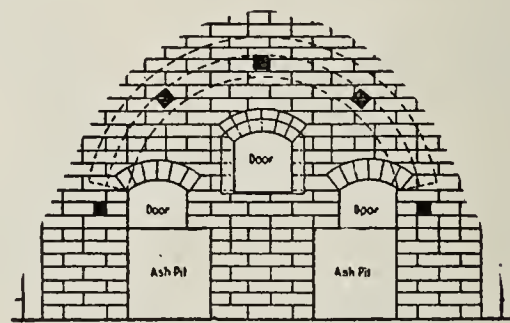
THE KILN that will save one ton of coal out of every seven tons you are using.

THE KILN which is so constructed that the heat is drawn from the bottom with Fan to dryer without danger of checking the cooling ware.

THE KILN that we will guarantee to burn any kind of clay ware with nothing but Slack Coal from start to finish of burn.

THE KILN that will burn Paving Brick in from 30 to 60 hours less time and not injure the ware, as the cold air is excluded from start to finish.

THE KILN that has the famous **Swift Coking-Table Furnace** attached to it; the furnace which is to-day being attached to all kinds of kilns—Up-draft, Clamp, Down-Draft, Round and Square, and also one continuous Kiln, has been re-modeled, and is giving entire satisfaction.



THE SWIFT COKING TABLE FURNACE.

F. E. SWIFT,

Send for Catalogue.

Washington, Iowa, U. S. A.

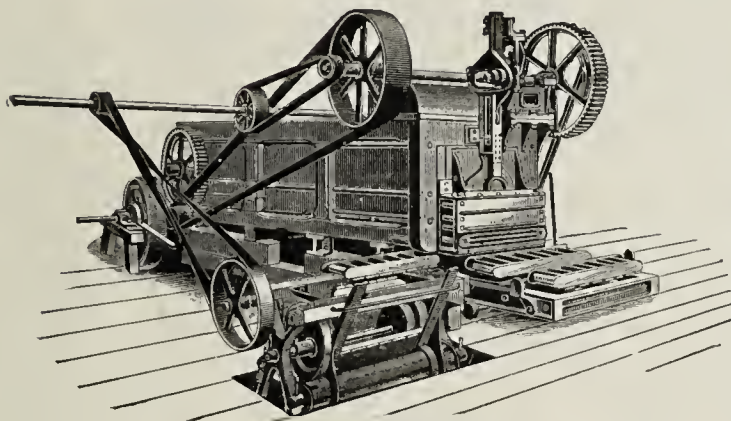
DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

.. THE ..

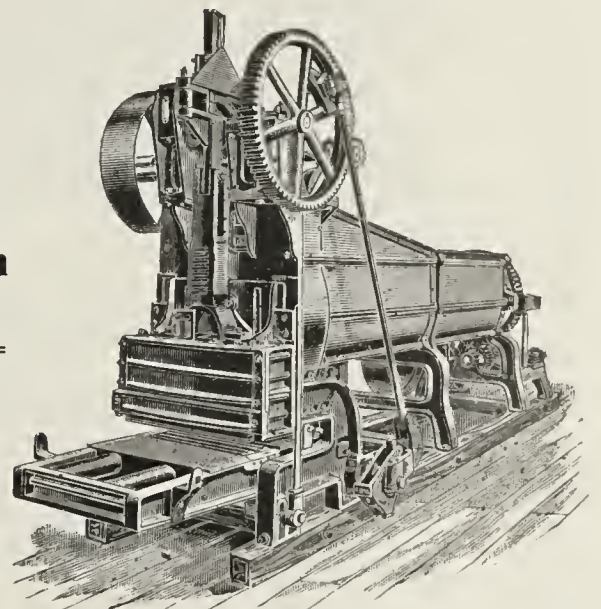
POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

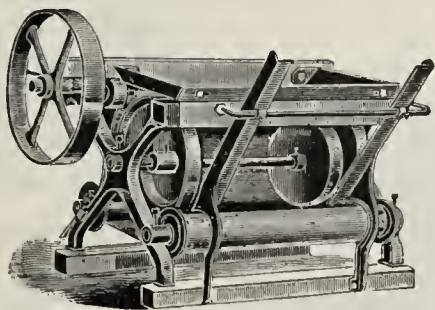
They have no equal
for making Brick which
have Clean, Sharp Cor-
ners and Smooth
Surfaces.



Iron Frame Pug Mill.

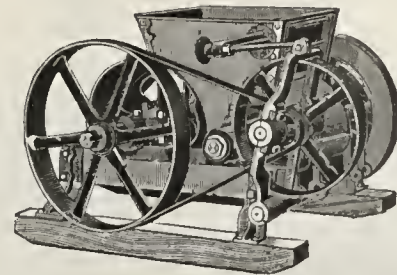
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.

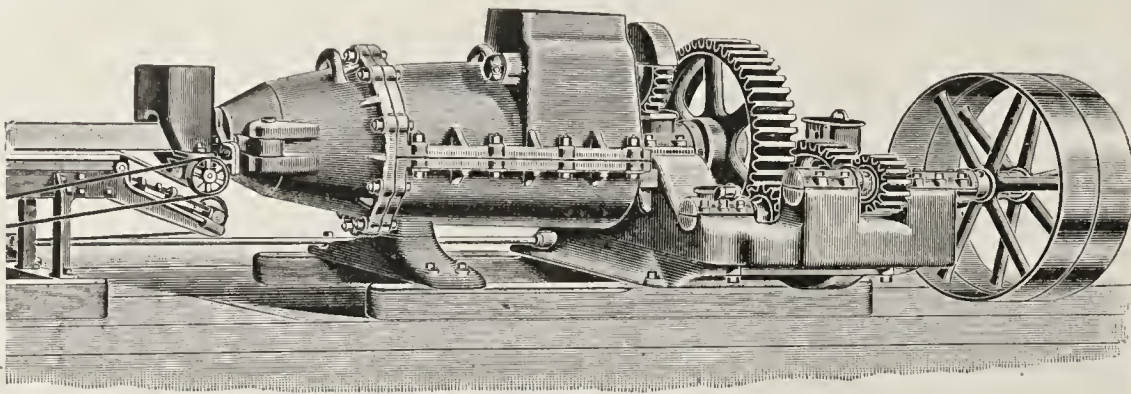
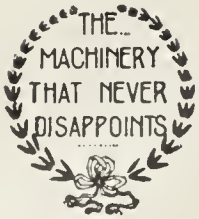


Disintegrators,

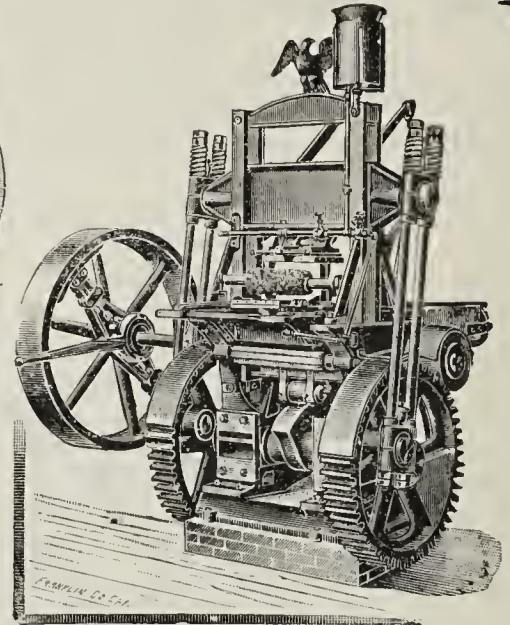
Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

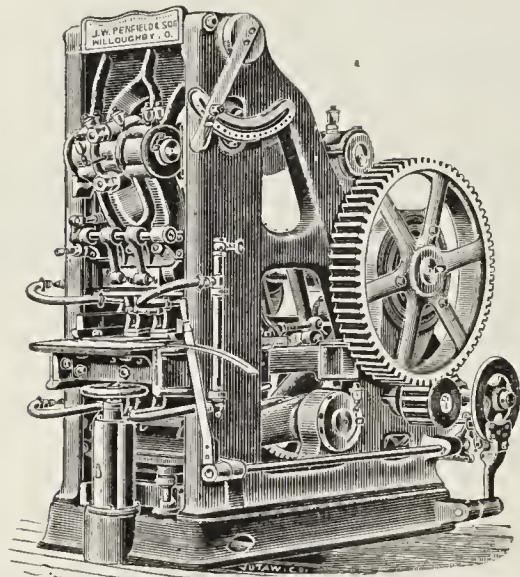
C. & A. POTTS & CO., 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**



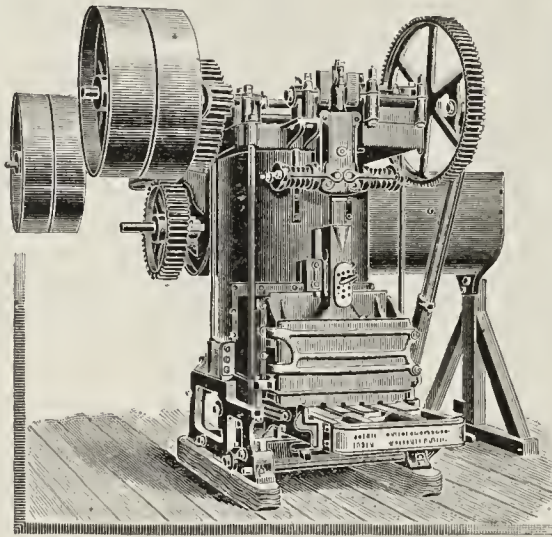
AUGER BRICK MACHINES.



REPRESSES, Double and Single Mold



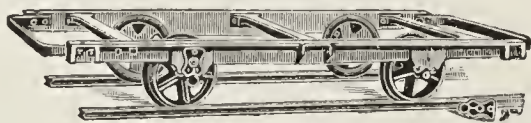
DRY PRESS MACHINES.



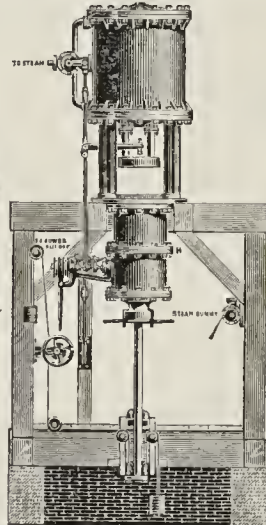
UPRIGHT STOCK BRICK MACHINES.



COMBINED MACHINES, Double and Single Geared.



CARS.



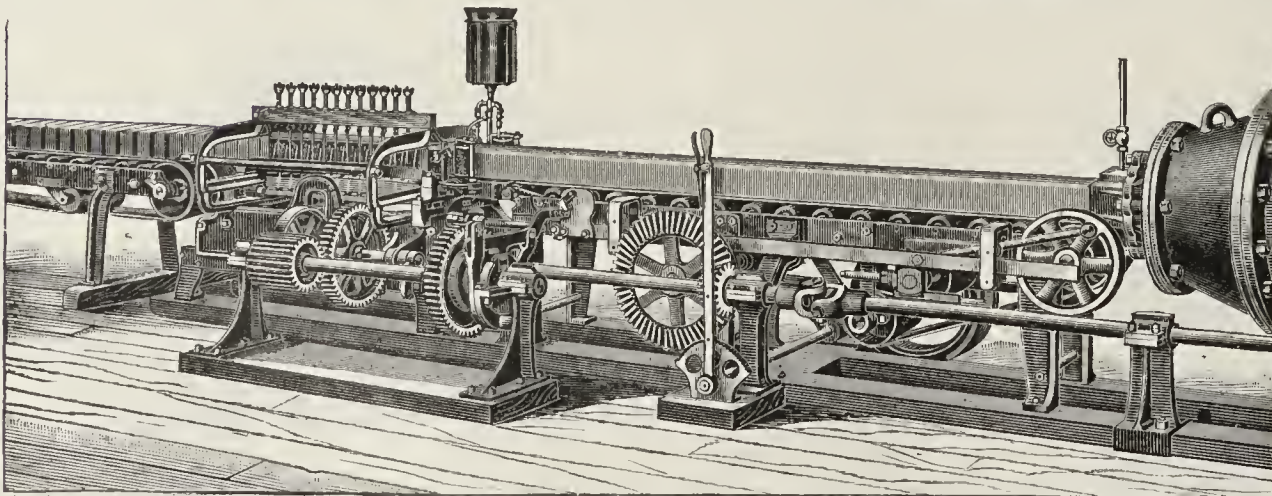
SEWER PIPE PRESSES.

The Built Right, Run Right Line.

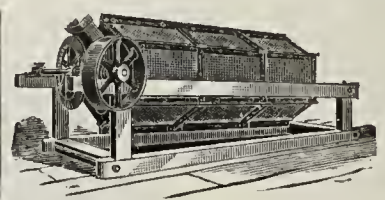
You don't pay for our mistakes because we have made every effort to guard against disappointments in our machinery and guarantee successful operation. Correct principles properly embodied in carefully constructed machinery have given our line an immunity to breaks and disappointments. We build them right, they run right. What more could you ask. Our line includes every machine and appliance for manufacturing and handling clay. A postal and a minute will bring you information about any or all of our line. Write to-day, to-morrow never comes.

**The American Clay-
Working Machinery Co.,**

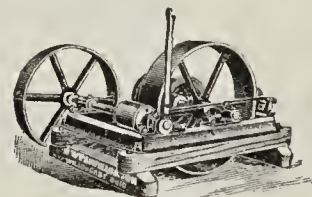
BUCYRUS OHIO, U. S. A.



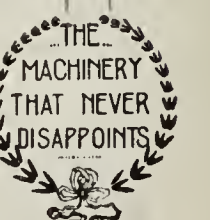
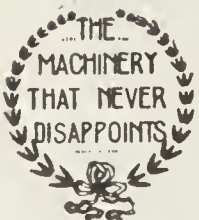
AUTOMATIC CUTTING TABLES, End and Side Cut.



SCREENS.



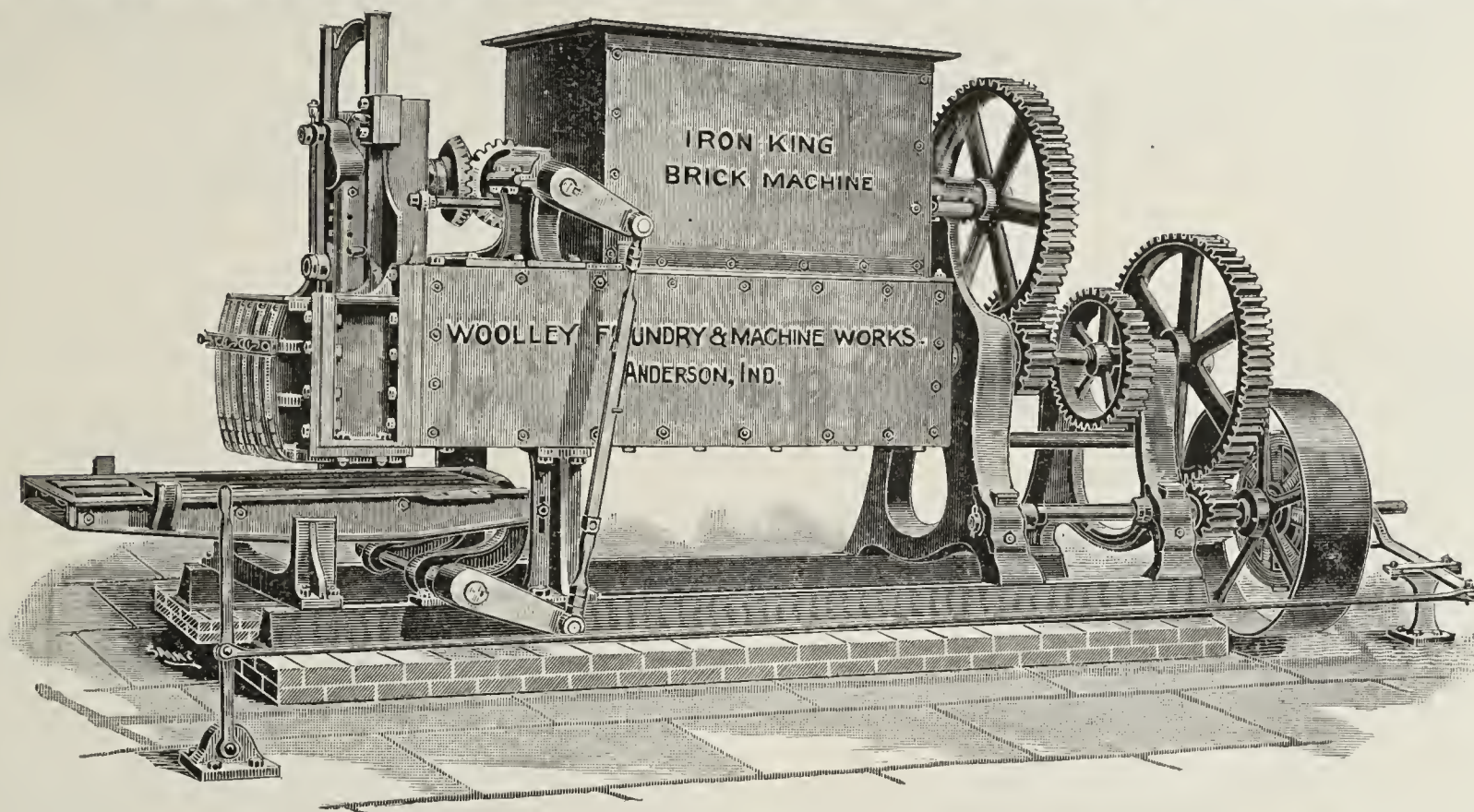
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IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



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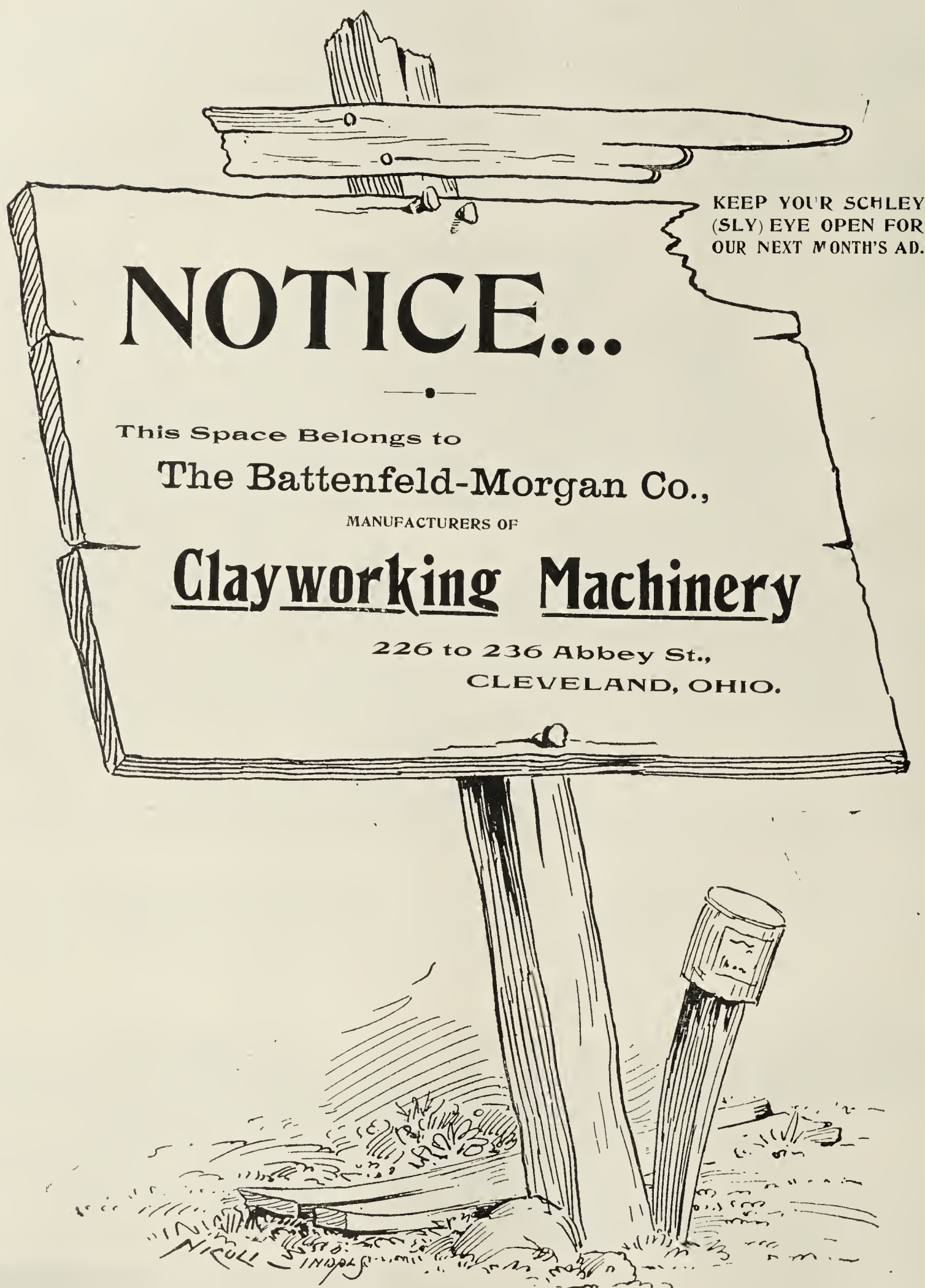
WOOLLEY DRY PANS,
PUG MILLS,
SLIP PUMPS
and PRESSES

Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

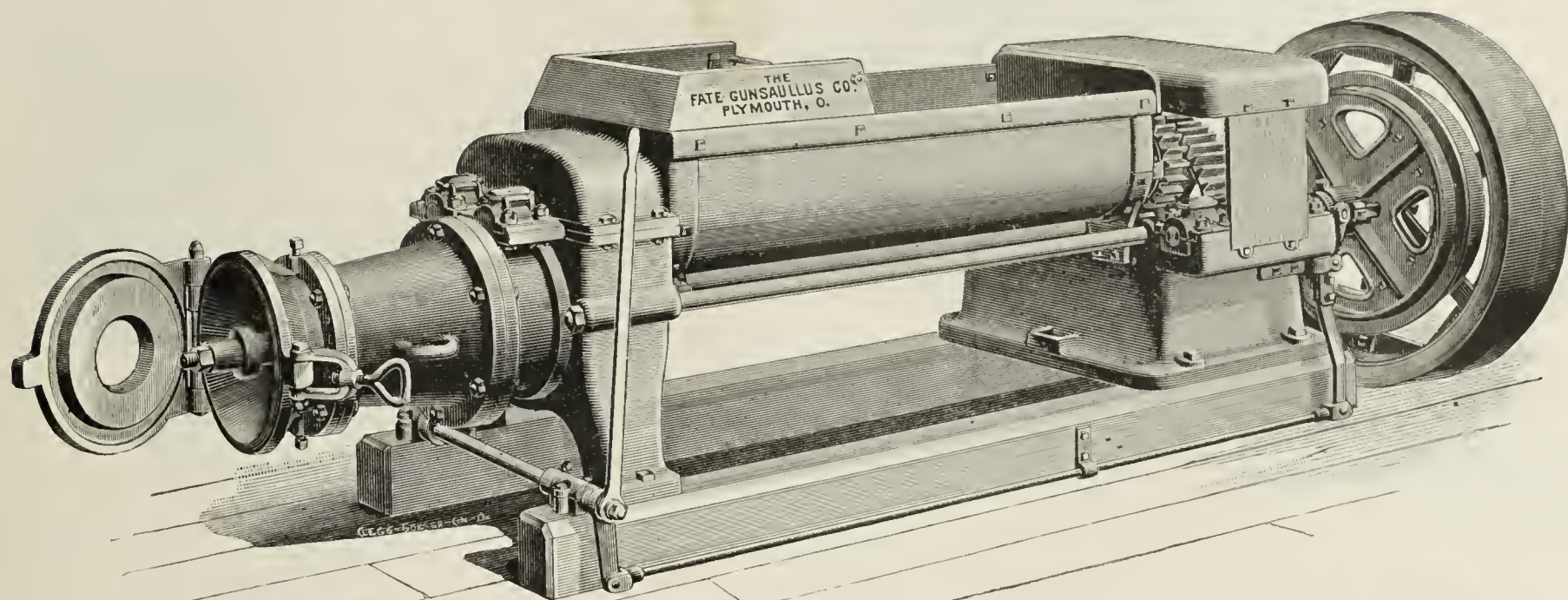
IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

Mention the Clay-Worker.

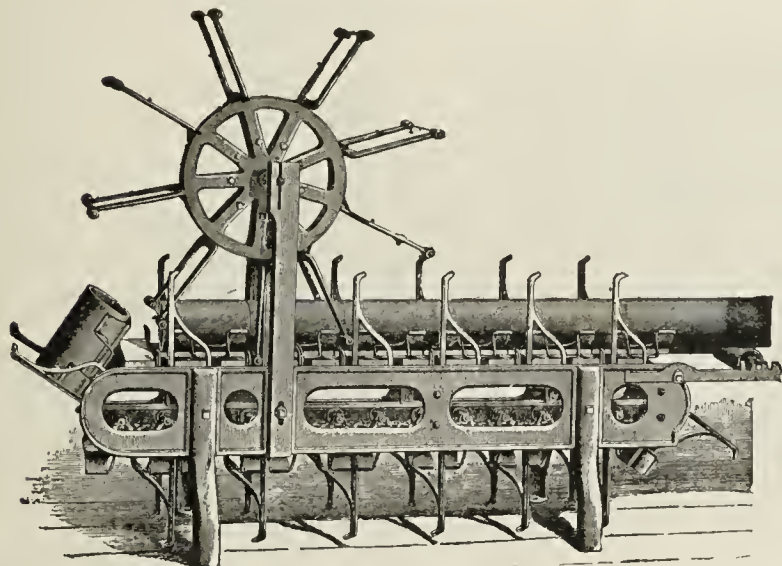




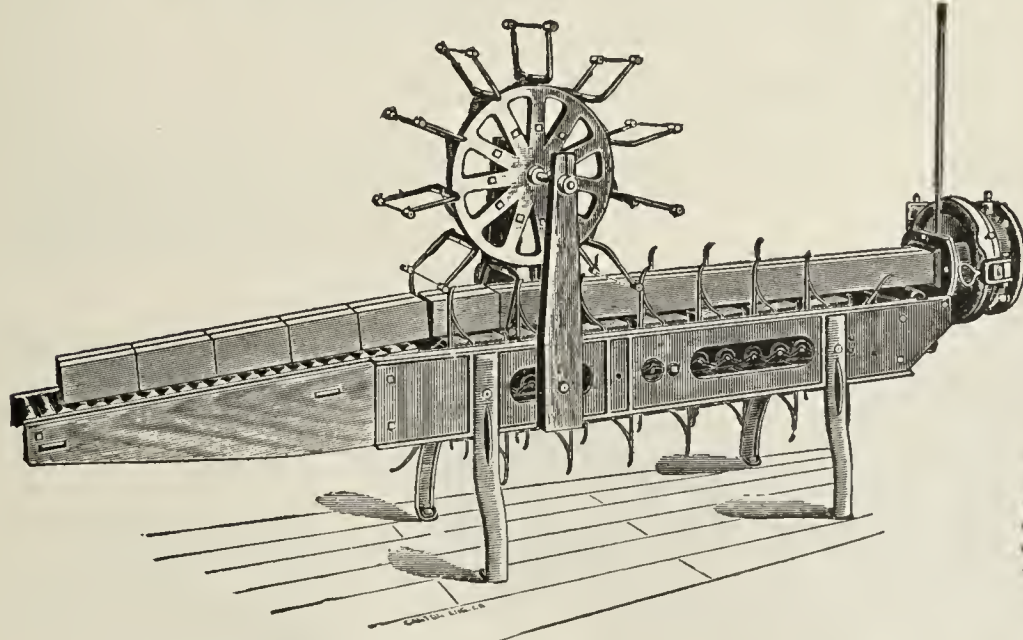
The "PLYMOUTH."



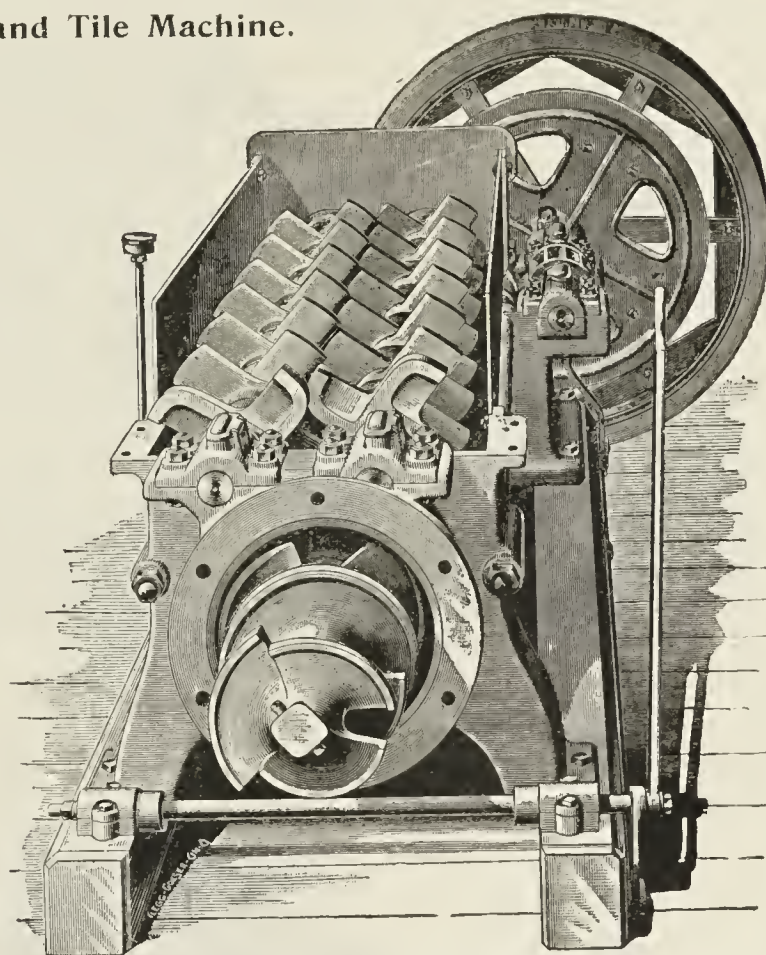
The "HUMMER" Combined Pug Mill, Brick and Tile Machine.



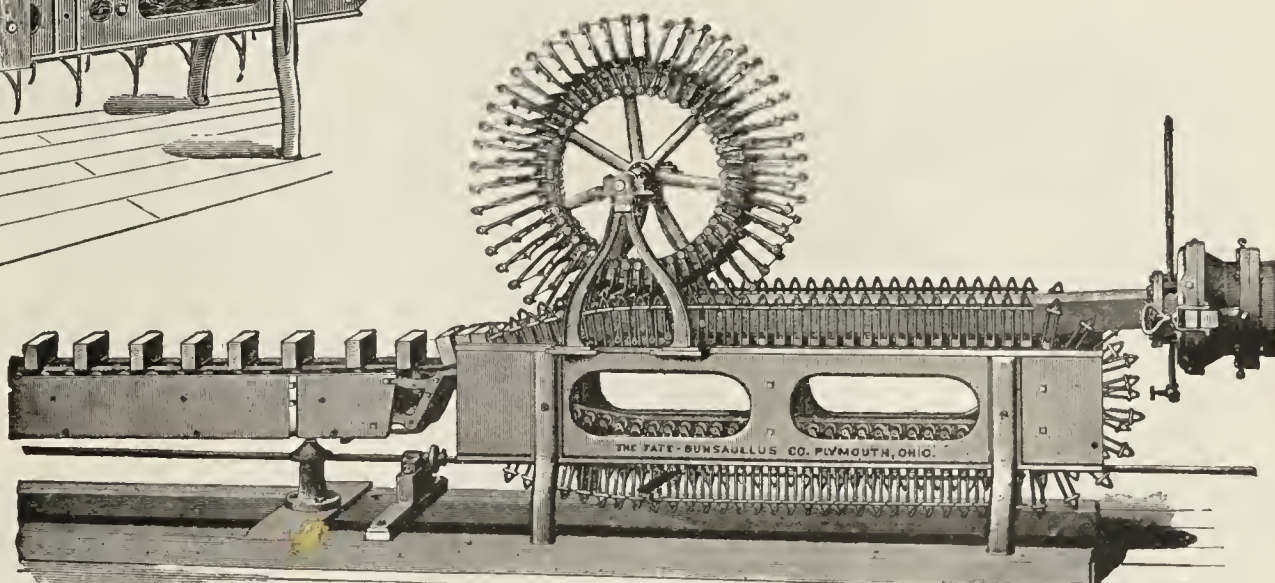
Automatic Table for Tile 2½ to 8-inch and Hollow Blocks.



Automatic End-Cut Brick Table.



"HUMMER" (Interior View.)



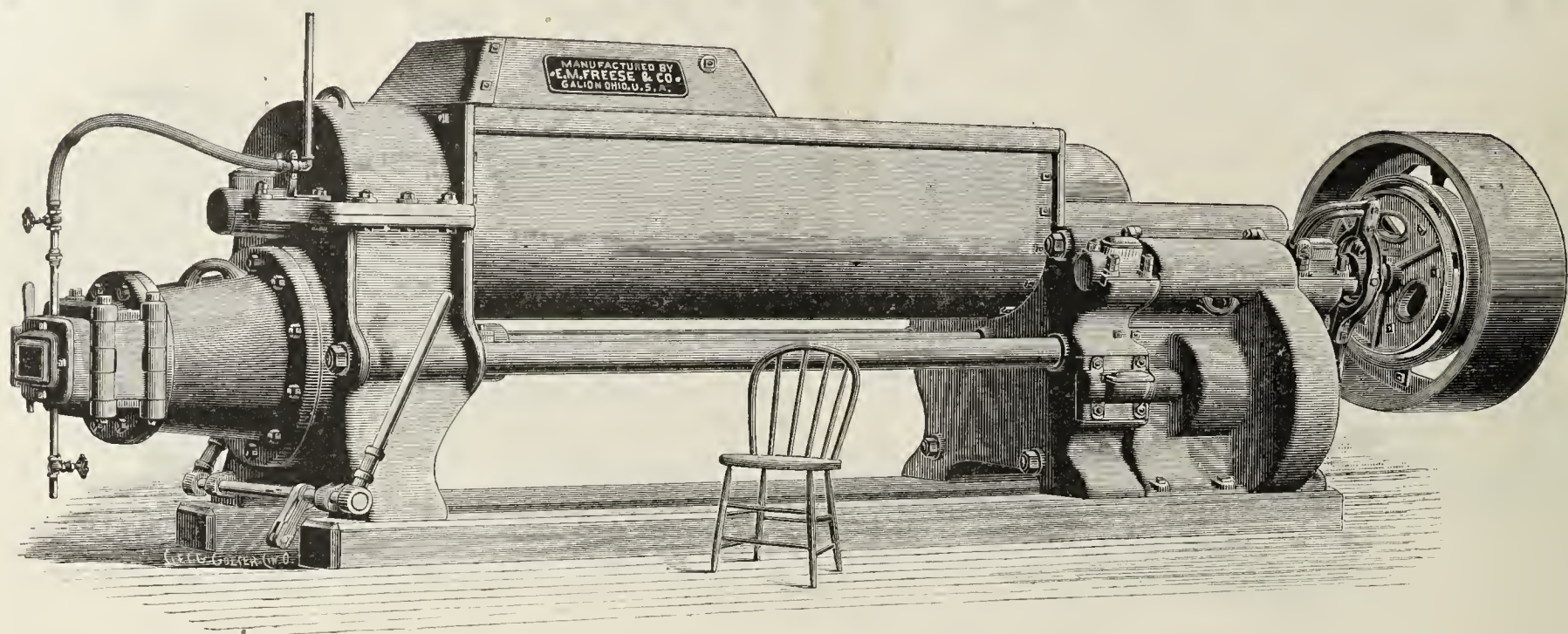
Automatic Side-Cut Brick Table.

Write for particulars to

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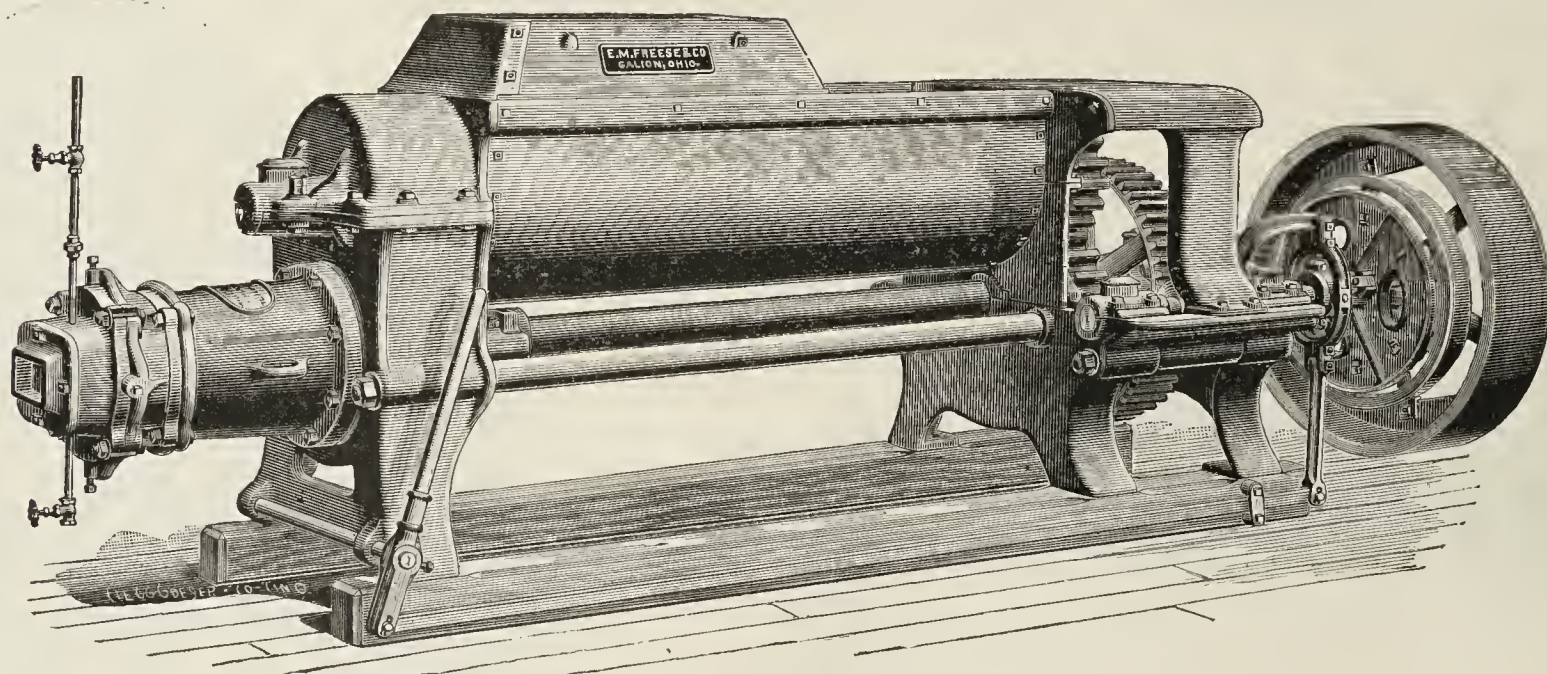
B. E. LaDow,
Special Western Representative,
406 Chamber of Commerce Bldg., CHICAGO, ILL.

The Original Union Brick Machines



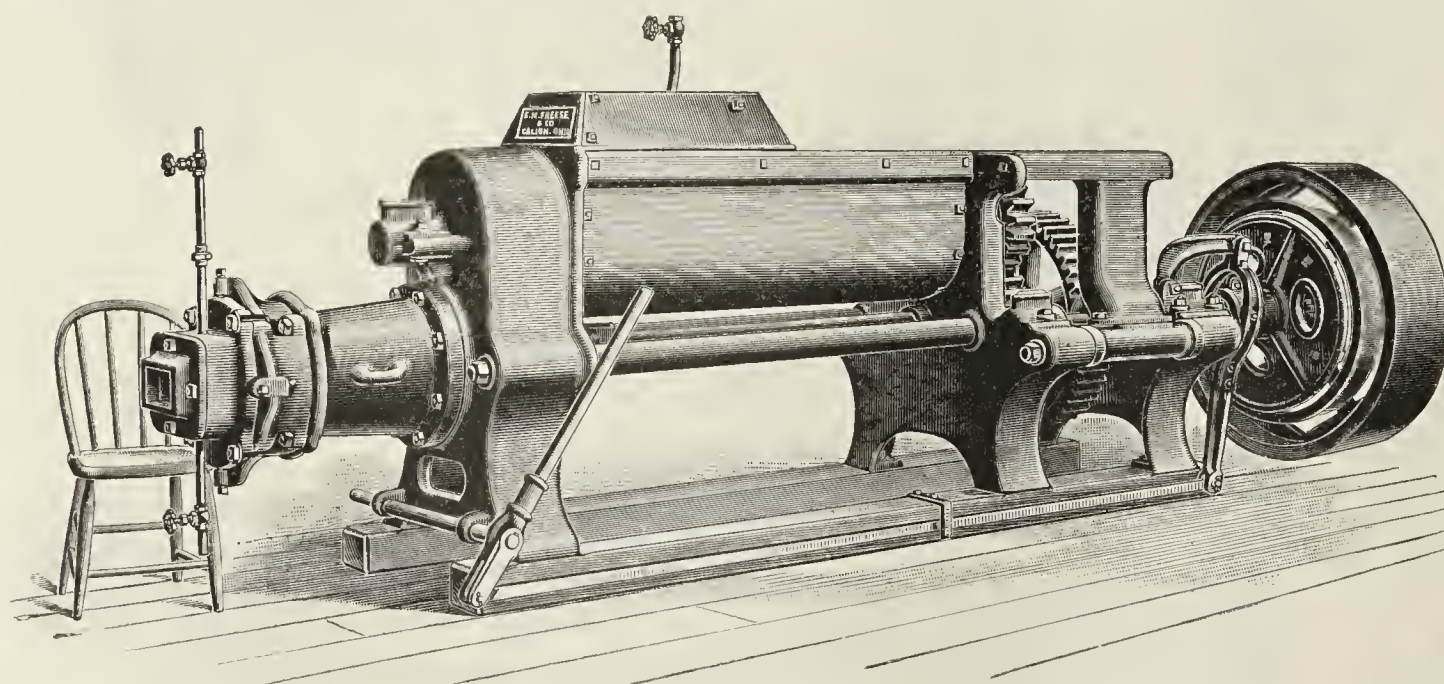
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Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



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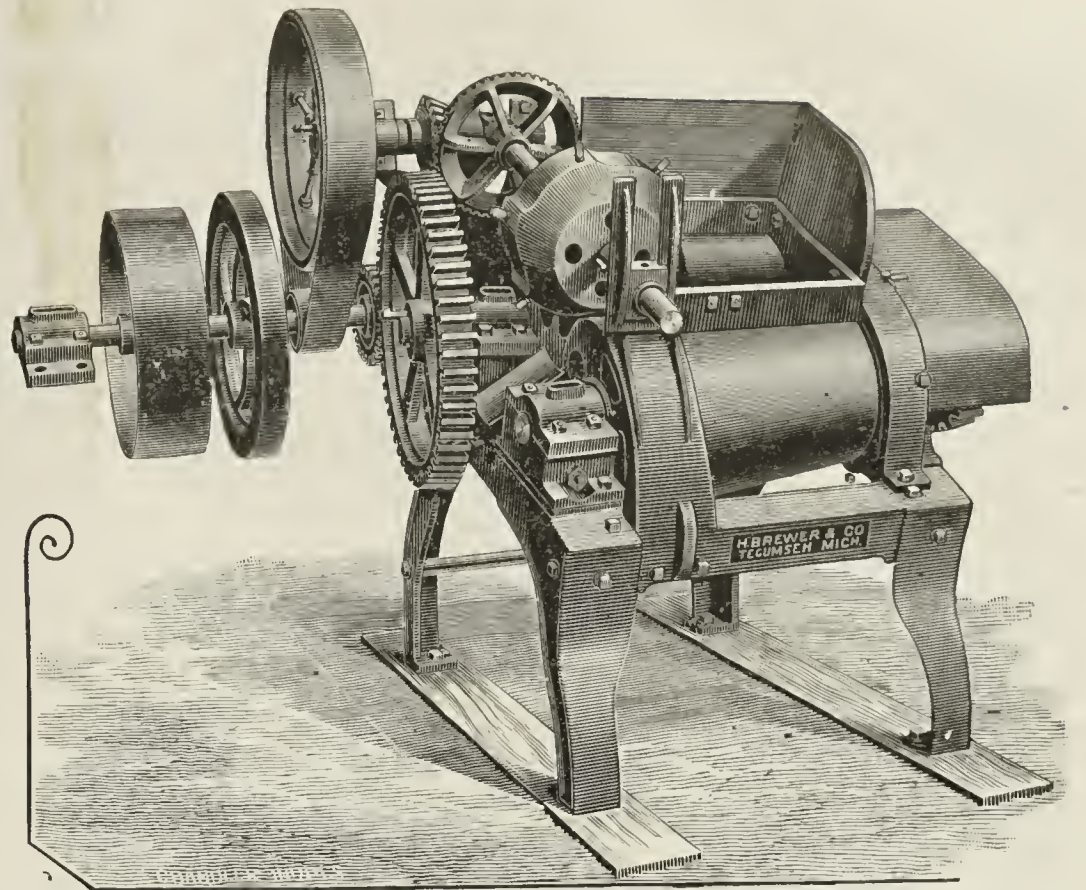
They are used in fifteen States.

They are a SUCCESS Investigate them.

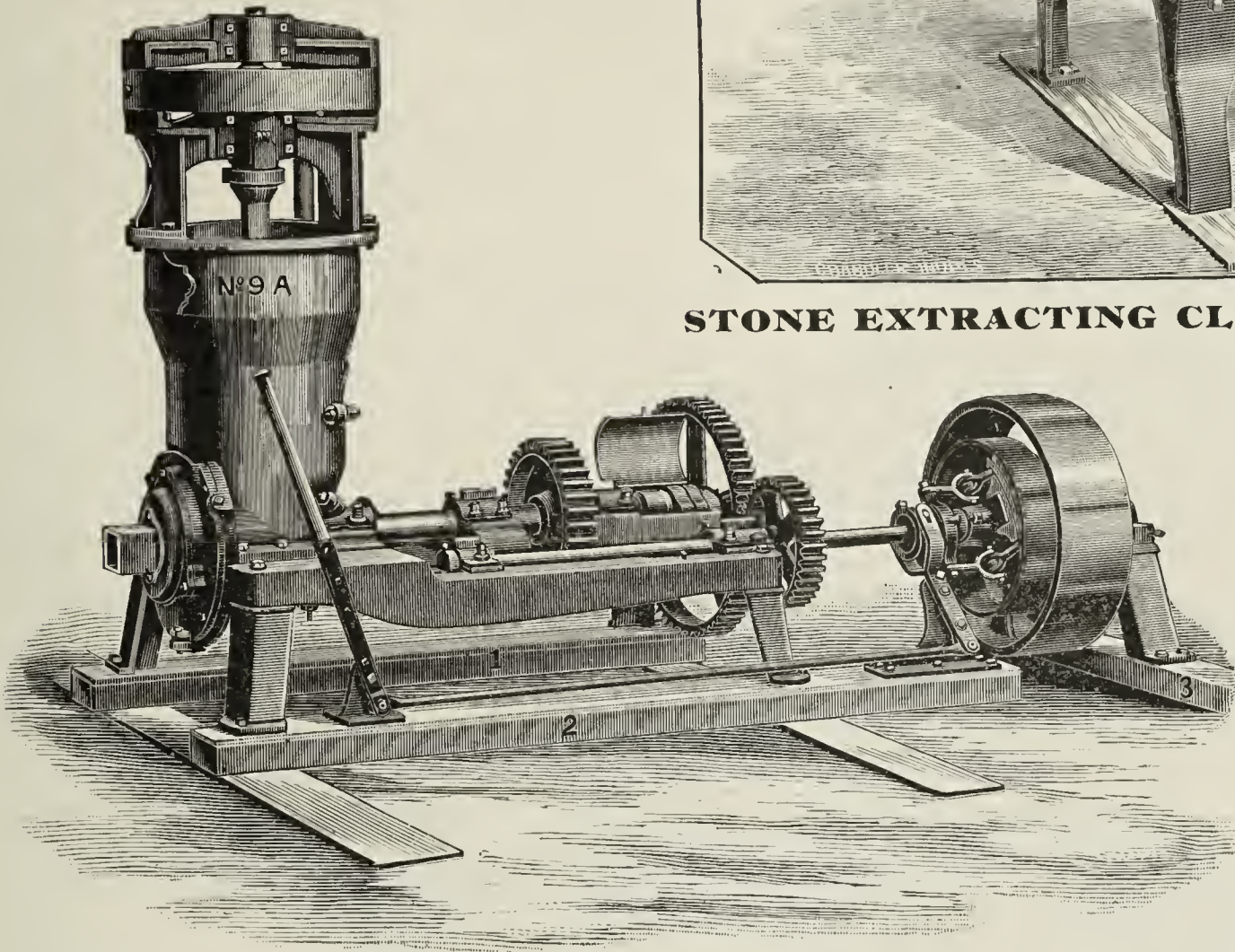
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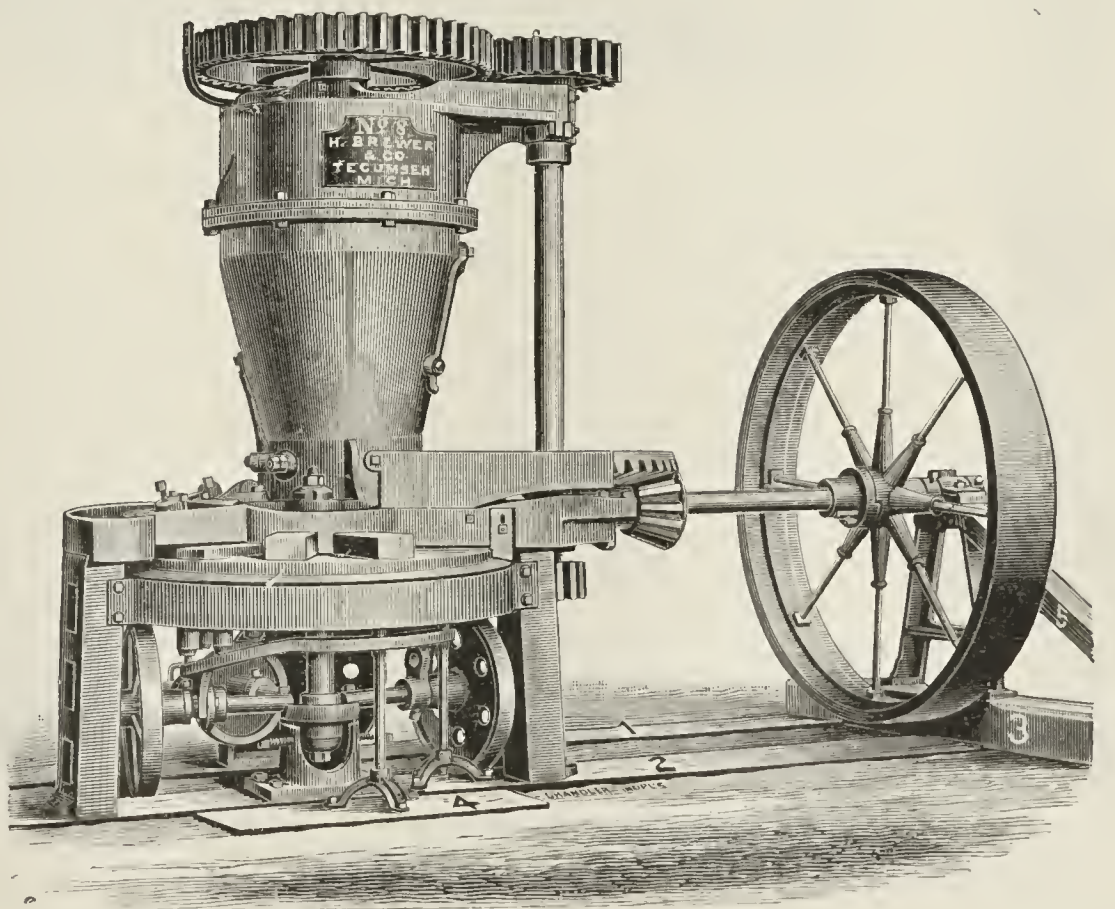
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Outfits
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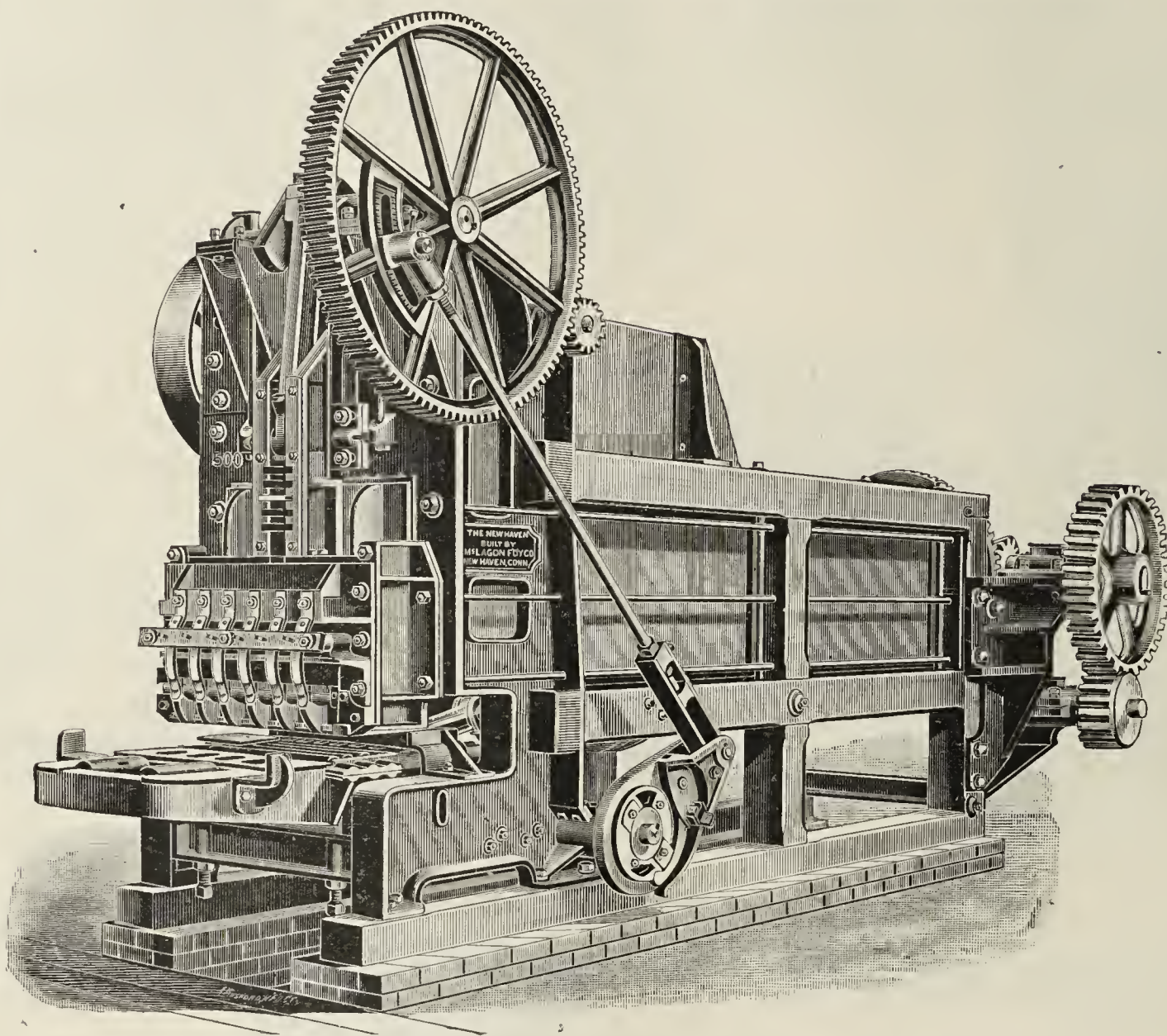
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If you will ask us, however, we will be very glad to send you circulars containing full description.

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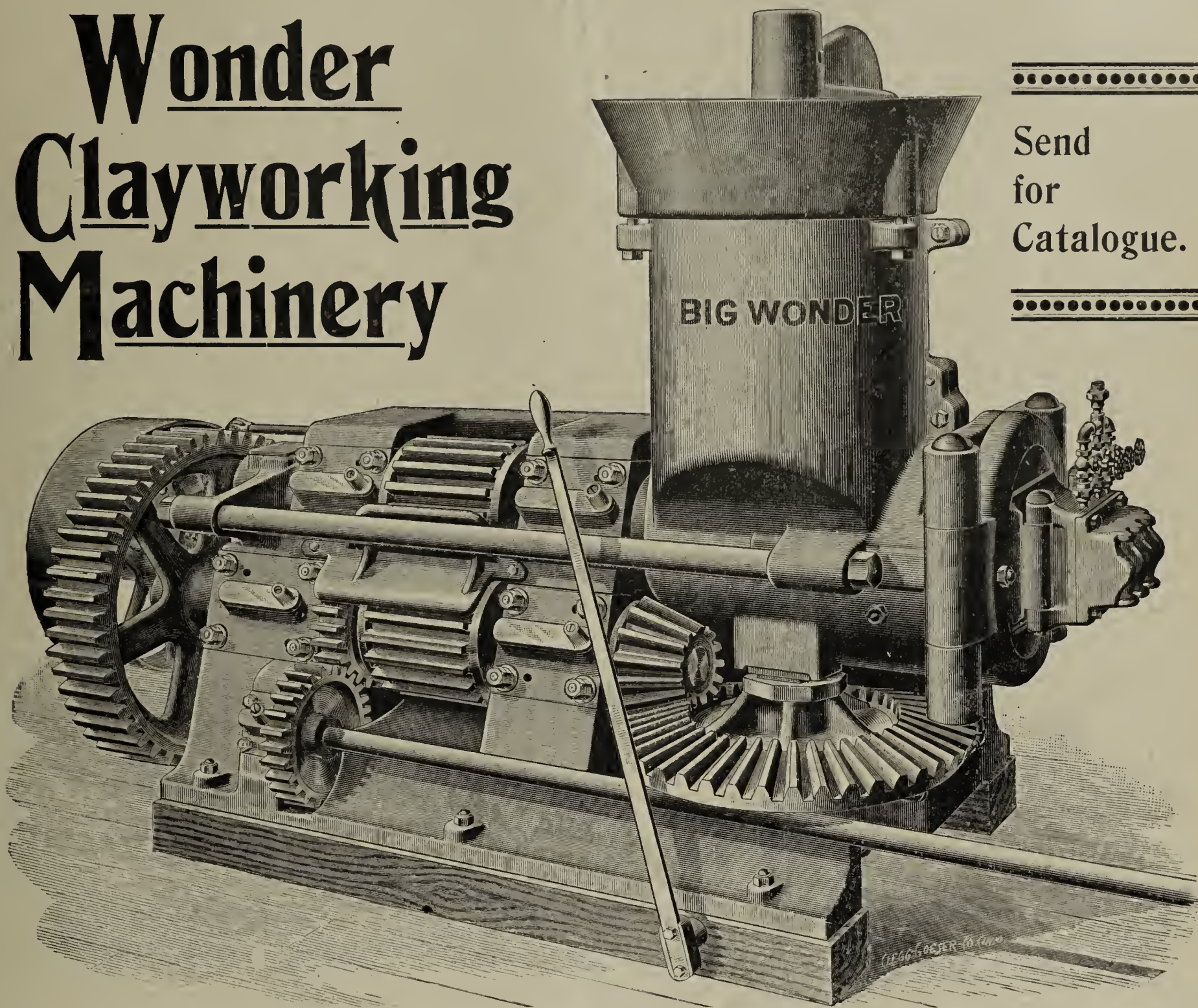


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WHICH is so called because it has proven by actual work in various kinds of clays to have a **Wonderful** capacity, both for quantity and quality. It has a **Wonderful** pugging and tempering capacity and produces a **Wonderfully** strong brick, free from laminations, and in connection with our new automatic cutting table a **Wonderfully** straight, true brick is made of almost any clay. It is this **Wonderful** quality that enables our machinery to work successfully some clays which other auger machines can not work at all satisfactorily. This fact has been demonstrated time and time again. The users of **WONDER MACHINERY** all testify that it is well worthy of the name. They have demonstrated that it has **Wonderful** wearing qualities for which reason it is, in the long run, the best and cheapest machinery on the market.

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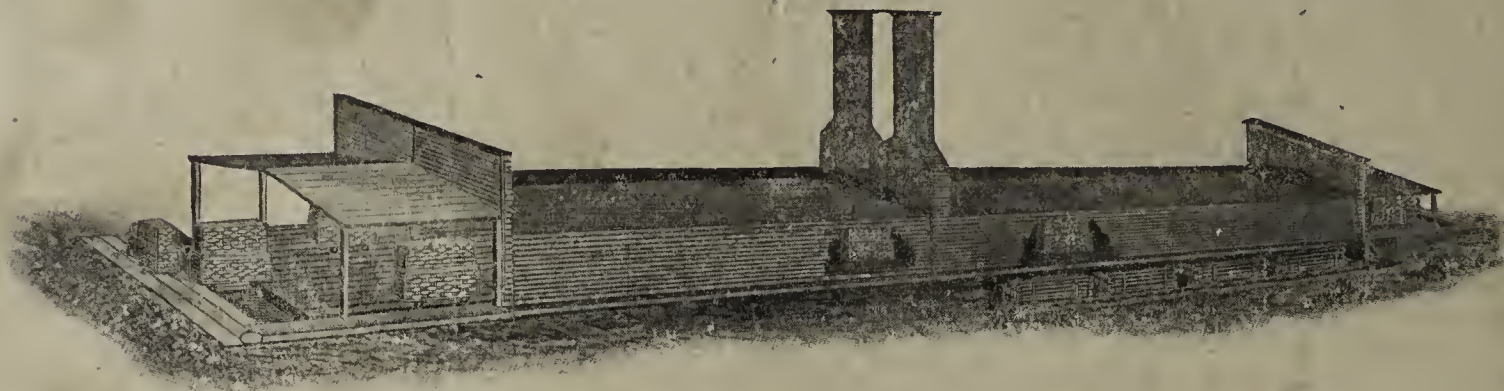
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This is a practical arrangement for drying all tender clay products that requires very careful drying. Each tunnel is divided into two chambers, the front being the preparatory, or tempering room, the rear the finishing chamber.

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**AMERICAN  
BLOWER  
COMPANY,  
DETROIT.**





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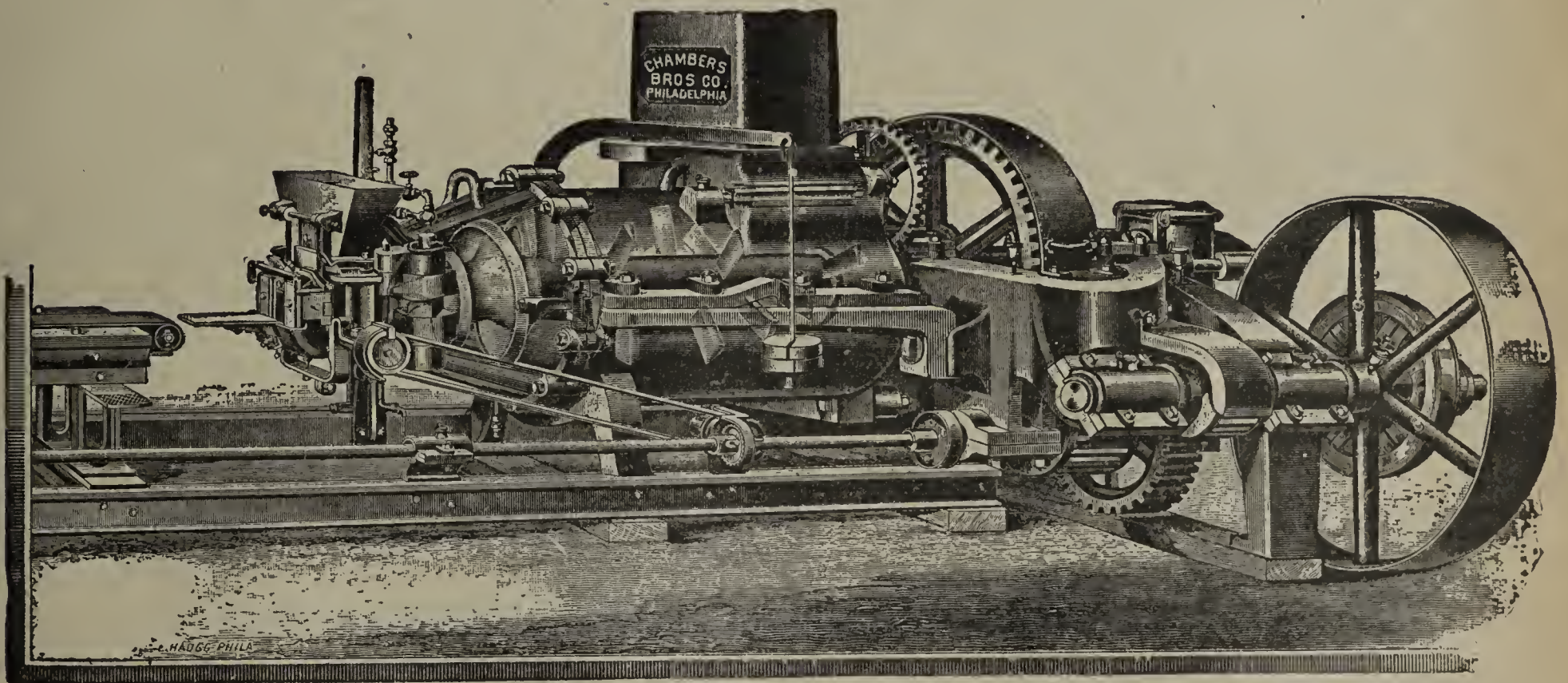
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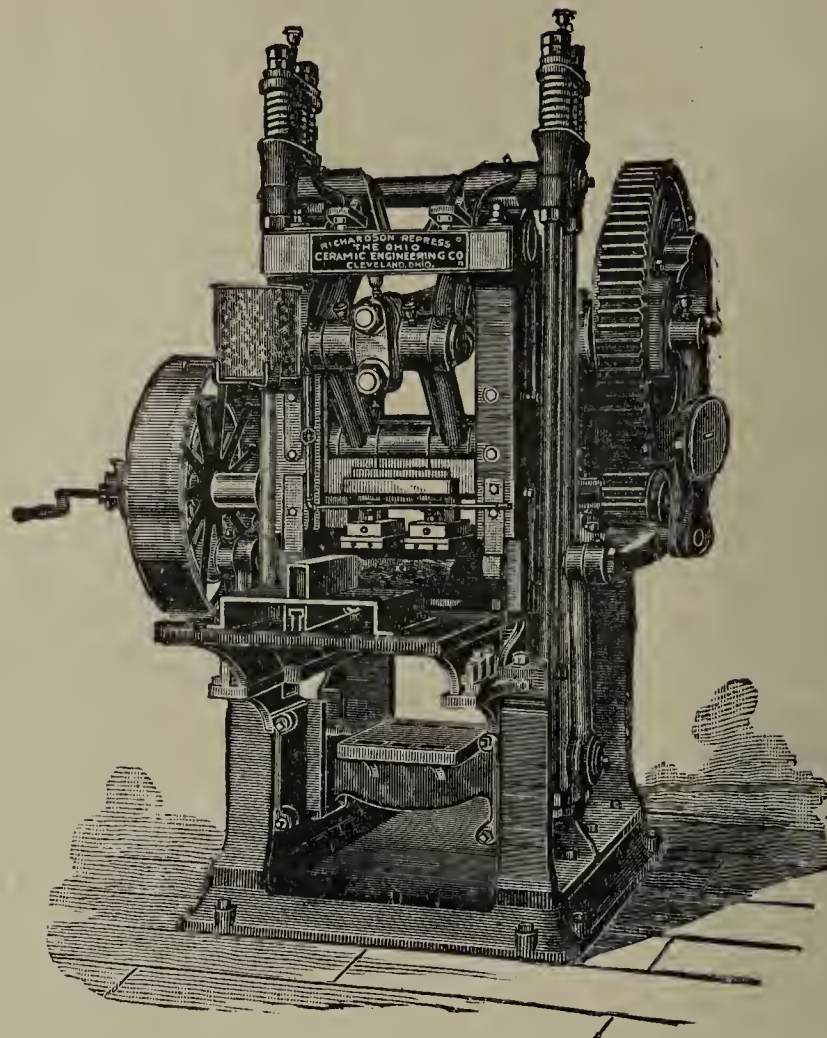
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## INDEX TO ADVERTISERS.

### Brick Machinery—Dry Press Process.

| Name.                                       | Page. | Name.                                    | Page. |
|---------------------------------------------|-------|------------------------------------------|-------|
| American Clay-Working Machine Co., The..... | 415   | Progress Press Brick and Machine Co..... | ..    |
| Chisholm, Boyd & White Co., The             | 340   | Ross-Keller Brick Machine Co. ..         | ..    |
| Fernholtz Brick Press Co., The.             | 342   | Simpson Brick Press Co .....             | 341   |

### Brick and Tile Machinery.

|                                              |          |                                         |          |
|----------------------------------------------|----------|-----------------------------------------|----------|
| American Clay-Working Machine Co., The.....  | 415      | Horton Mfg Co, The.....                 | 410      |
| Anderson Foundry and Machine Works.....      | 405      | Huetteman & Cramer Co, The..            | 406      |
| Baird and Son, H. C.....                     | 397      | Kells & Sons .....                      | 397      |
| Battenfeld-Morgan Co., The....               | 389      | Leader Mfg. Co, The.....                | 407      |
| Brewer, H. & Co .....                        | 417      | Madden & Co.....                        | 401      |
| Chambers Brothers Co.....                    | 337, 407 | Ohio Ceramic Engineering Co., The.....  | 338      |
| Chicago Brick Machinery Co....               | 394      | Potts & Co., C. & A.....                | 414      |
| Eastern Machinery Co, The....                | 418      | Raymond & Co., C. W.....                | 385      |
| Fate & Co., The J. D.....                    | ..       | Steele, J. C., & Son.....               | 404      |
| Freese, E. M. & Co .....                     | 416      | Taplin, Rice & Co.....                  | 412      |
| Henry Martin Brick Machine Mfg Co, The ..... | 398, 406 | Wallace Mfg. Co, The.....               | 393, 419 |
| Hensley, J. W.....                           | 339      | Wellington Machine Co, The...           | 387      |
|                                              |          | Wiles Co., A. M. & W. H.....            | 404      |
|                                              |          | Woolley Foundry and Machine Works ..... | 413      |

### Brick Kilns and Dryers.

|                                |     |                                |     |
|--------------------------------|-----|--------------------------------|-----|
| Alsip, S. H .....              | 403 | Morrison & Co., R. B .....     | 408 |
| American Blower Co, The.....   | 420 | Martin Dryer Co.....           | 396 |
| Barron, A. F.....              | 420 | Phillips, S. G.....            | 396 |
| Carson, J. W.....              | 402 | Pike, E. M.....                | 396 |
| Eudaly, W. A .....             | 408 | Reppell, L. H .....            | 403 |
| Fernholtz Brick Press Co, The. | 342 | Standard Dry Kiln Co, The..... | 344 |
| Haigh, H.....                  | 409 | Swift, F. E.....               | 411 |
| Lehmann & Co, F.....           | 409 | Yates, Alfred.....             | 402 |

### Brick Yard Supplies.

|                                              |          |                                                 |     |
|----------------------------------------------|----------|-------------------------------------------------|-----|
| Atlas Bolt & Screw Co, The.....              | 402      | Jeffrey Manufacturing Co, The.                  | 401 |
| Caldwell & Son Co., H. W.....                | 399      | Marion Steam Shovel Co.....                     | 405 |
| Carmichael, T. W.....                        | 397      | Main Belting Co .....                           | 395 |
| Carnell, Geo.....                            | 403      | Mershon & Co., W. B.....                        | 399 |
| Coldewe & Co., G.....                        | 395      | Mey, F. H. C.....                               | 402 |
| Elder & Dunlap.....                          | 398      | Newton, A. H.....                               | 401 |
| Frost Engine Co .....                        | 343      | Phillips & McLaren .....                        | 400 |
| Harrington & King Perforating Co, The .....  | 339      | Pittsburg Mineral Screen Company, The .....     | 398 |
| Henry Martin Brick Machine Mfg. Co, The..... | 398, 406 | Stedman's Machine Works.....                    | 404 |
| Horton Mfg. Co, The.....                     | 410      | Williams Patent Crusher and Pulverizer Co ..... | 397 |

### Miscellaneous.

|                                                 |     |                                            |          |
|-------------------------------------------------|-----|--------------------------------------------|----------|
| Associated Trade & Industrial Press.....        | 399 | Indianapolis Engraving and Electro Co..... | 401, 402 |
| Bennett & Sayer.....                            | 397 | Indiana, Decatur & Western ...             | 400      |
| Big Four R. R.....                              | 399 | Illinois Central R. R .....                | 402      |
| Cincinnati, Hamilton & Dayton R. R .....        | 400 | Kendall & Flick.....                       | 396      |
| Chesapeake & Ohio R. R.....                     | 401 | Lake Erie & Western.....                   | 401      |
| Clinton Paving and Building Brick Co., The..... | 390 | Many, F. B.....                            | 395      |
| Coaldale Brick and Tile Co., The                | 390 | McAvoy Vitrified Brick Co ....             | 391      |
| Cotton Belt Route.....                          | 401 | Monon Route .....                          | 400      |
| Des Moines Brick Manufacturing Co., The.....    | 390 | Osborne, W. R.....                         | 397      |
| Dean Bros. Steam Pump Works                     | 400 | Philadelphia Commercial Museum, The.....   | 398      |
| Dover Fire Brick Co.....                        | 399 | Purinton Paving Brick Co, The              | 391      |
| Evens & Howard .....                            | 396 | Rockwood Mfg. Co, The.....                 | 400      |
| Gabriel & Schall.....                           | 396 | Rochester Optical Co.....                  | 397      |
| Geysbeek, S.....                                | 400 | St. Louis Terra Cotta Co.....              | 398      |
| Hoosier Stamp Co.....                           | 395 | Tennille, A. F.....                        | 398      |
| Indiana Bermudez Asphalt Co.                    | 390 | Vandalia Line .....                        | 399      |
|                                                 |     | VanDuzen Co, The E. W.....                 | 400      |
|                                                 |     | Wabash Railroad.....                       | 399      |
|                                                 |     | Small Ads., Wanted, For Sale, etc.         |          |

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CHICAGO, ILL.

**THE H. & K. P. CO.**  
PERFORATED SHEET STEEL  
FOR  
**CLAY SCREENS**

SEWER PIPE  
BRICK  
FOR CHUTE  
SCREENS.  
TERRA-COTTA  
FOR REVOLVING  
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SCREENS.

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# The MONARCH

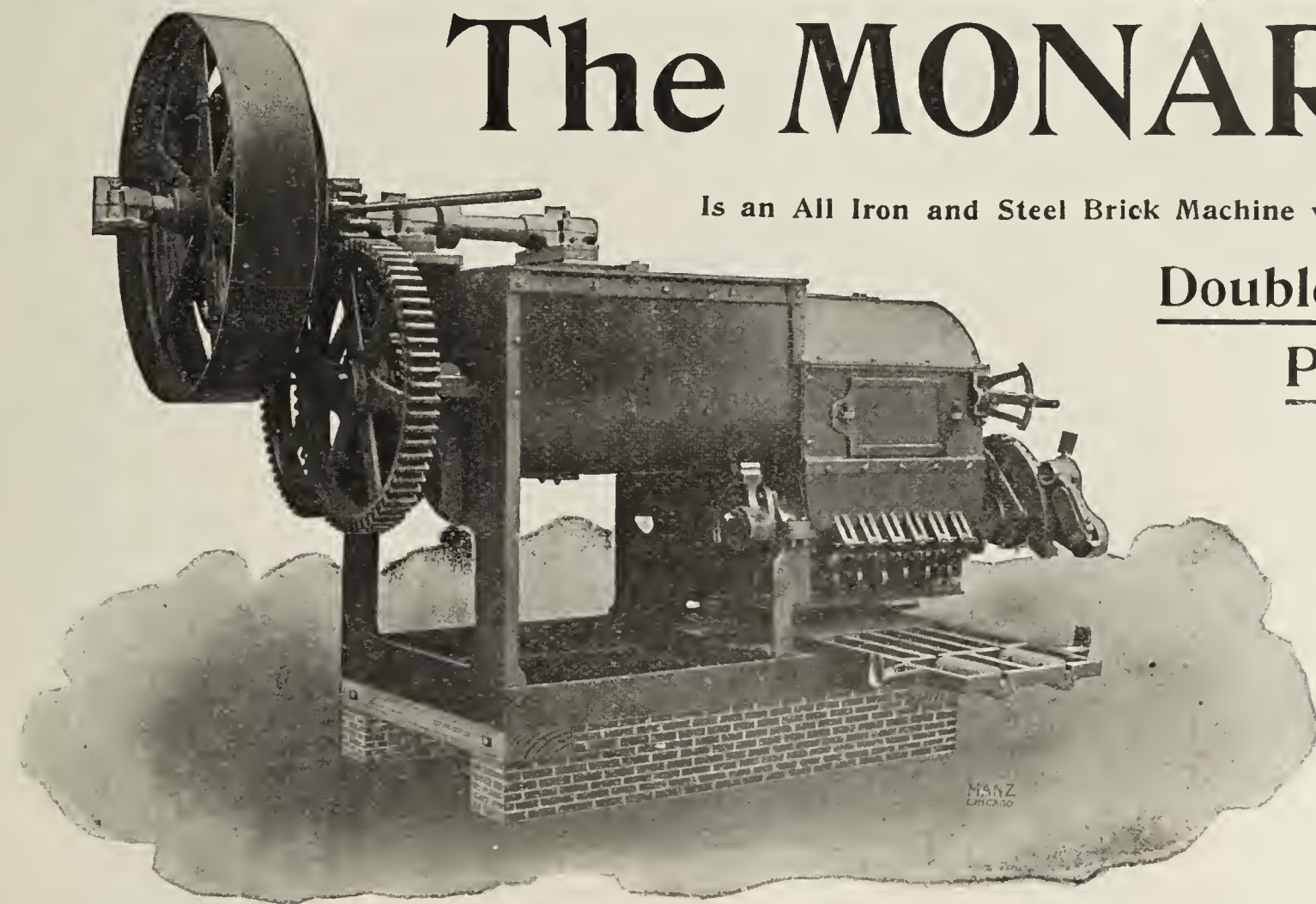
Is an All Iron and Steel Brick Machine with

Double  
Pug Mill.

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SIMPLE  
IN CON-  
STRUCTION,  
DURABLE  
AND ...  
POWERFUL.

...



Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new IRON QUAKER. Engines and boilers. Send for 1898 Catalogue.

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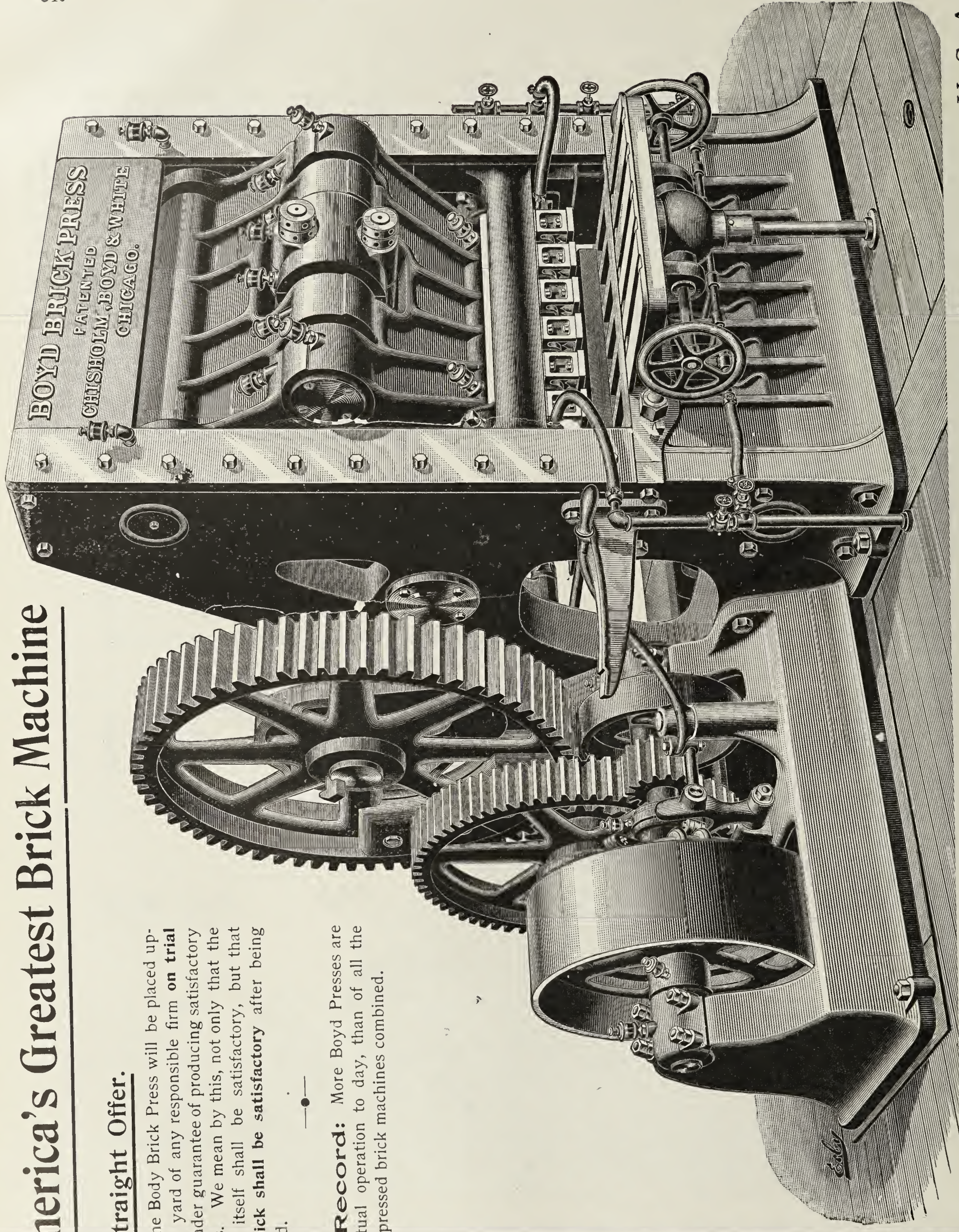


# America's Greatest Brick Machine

## A Straight Offer.

The Body Brick Press will be placed upon the yard of any responsible firm on trial and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the brick shall be satisfactory after being burned.

**Its Record:** More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



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A. B. C. CODE USED

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THE inexorable law of the "Survival of the Fittest" is well illustrated in the continued success of the **SIMPSON BRICK PRESS**. It was one of the first successful dry presses manufactured in America and from its introduction has held a leading place. The improved **SIMPSON PRESS** is a thoroughly up-to-date machine and embodies many excellent features, that make it invaluable to the brickmaker who wishes to make the best quality of Press Brick—at moderate cost.

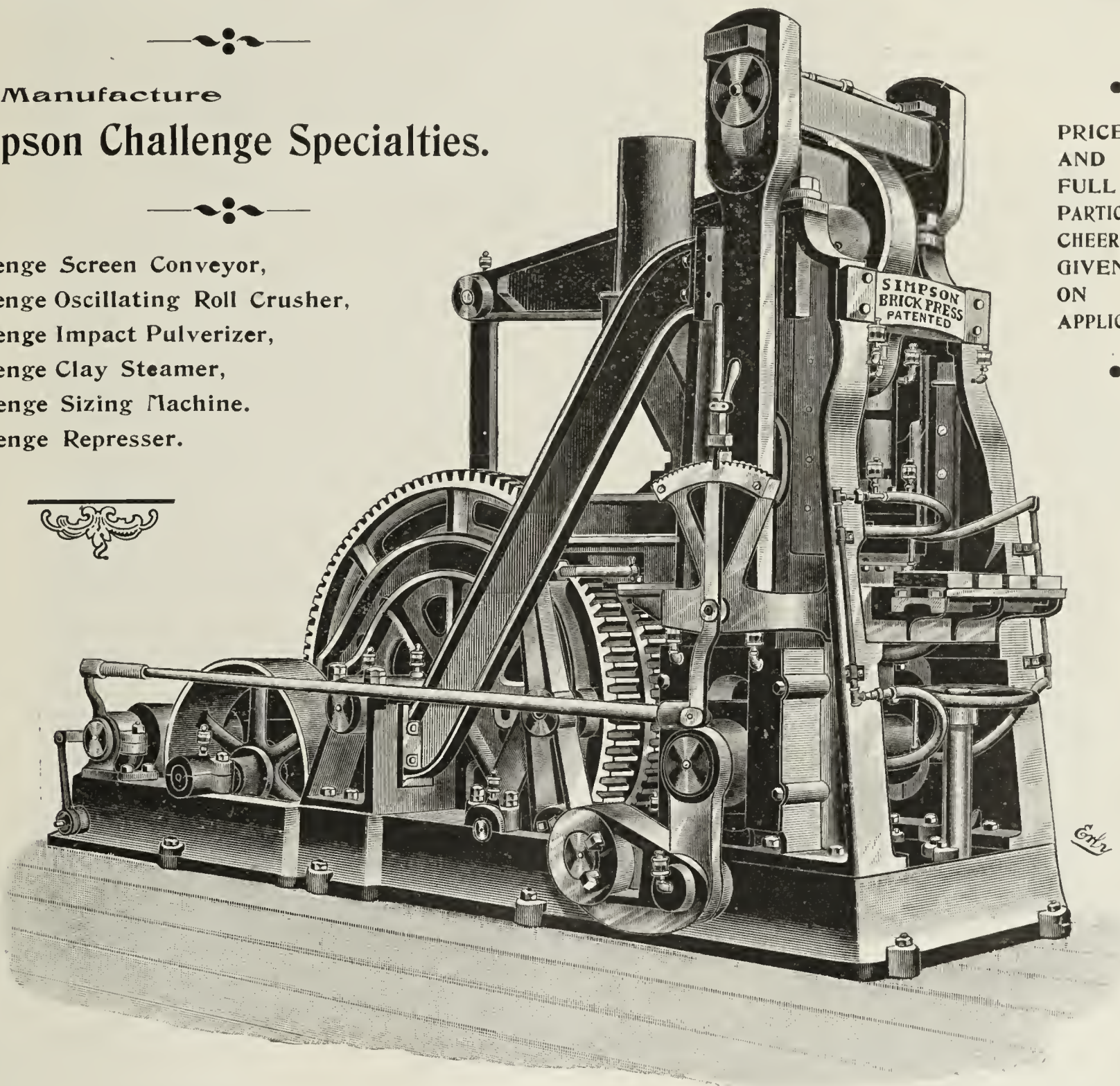
We make a specialty of complete equipments including every device required on a modern press brick plant. Don't fail to get a list of our new improved Challenge Clay Preparing Machinery.

We Manufacture

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Challenge Screen Conveyor,  
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Challenge Clay Steamer,  
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PARTICULARS  
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Simpson's 4-Mold Brick Press, Model AA, New Style. BUILT IN 4 SIZES.

**SIMPSON MACHINERY CO.,**

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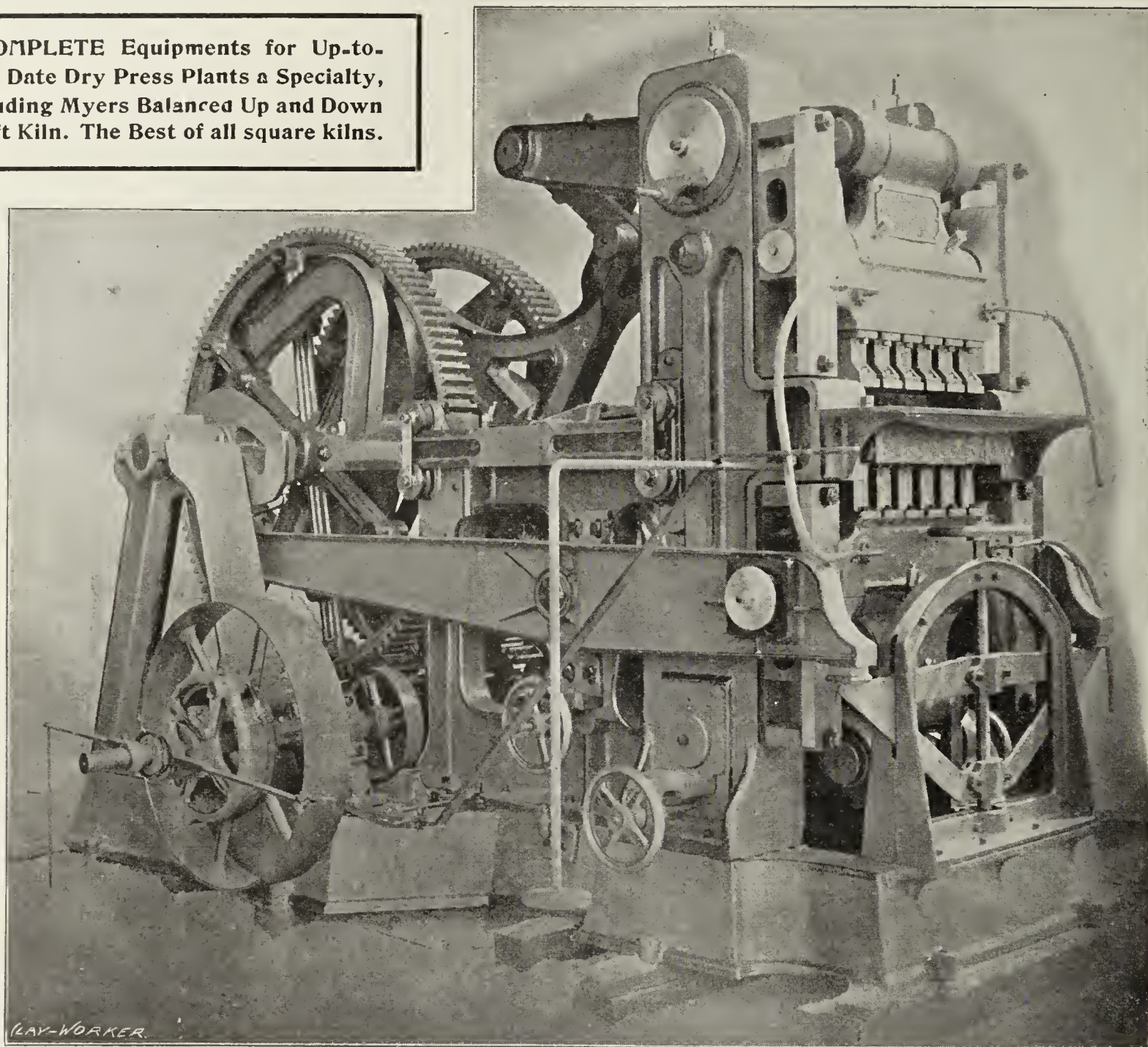
CHICAGO.



# The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

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The Fernholtz Six-Mold Brick Press.

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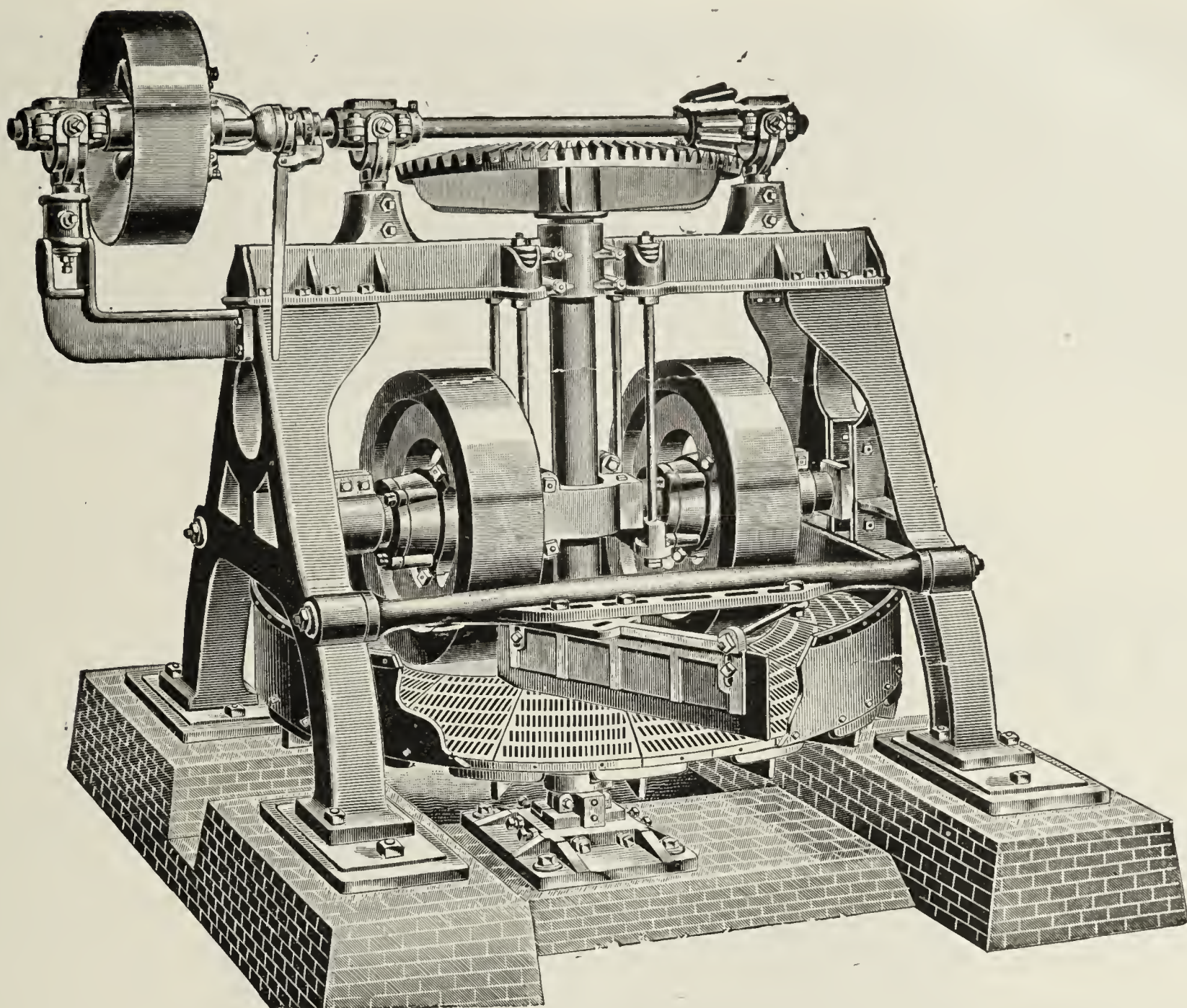
The opinion of those using our press and full information on application.

## The Fernholtz Brick Press Co.,

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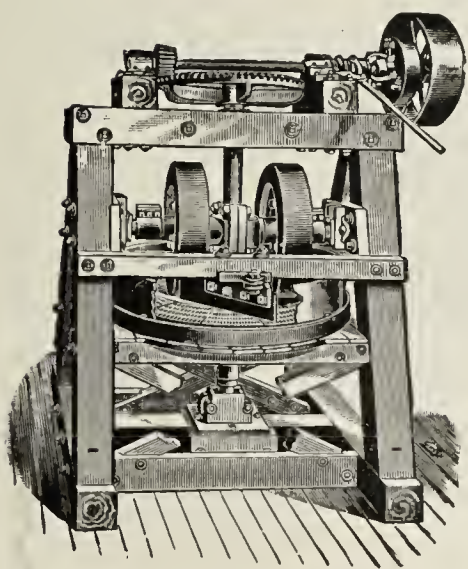
ST. LOUIS, MO.





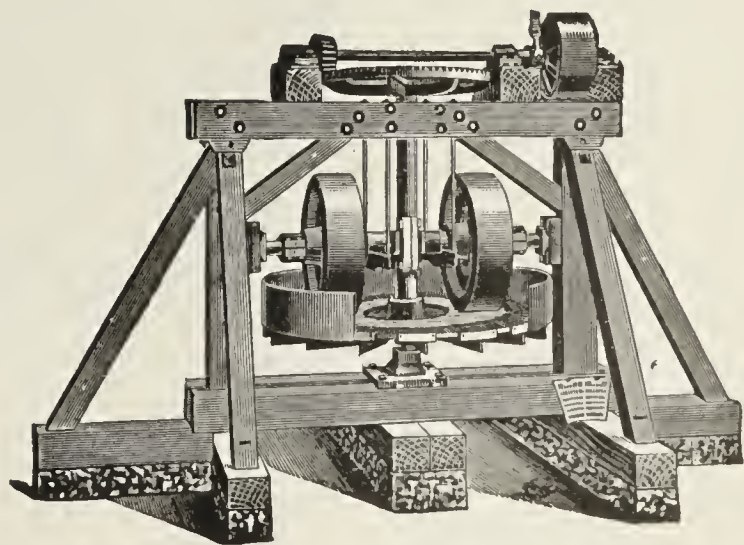
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DRY PANS.



IRON FRAMES,  
WOOD FRAMES.

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All Sizes and Price
to suit
Any Size Plant.
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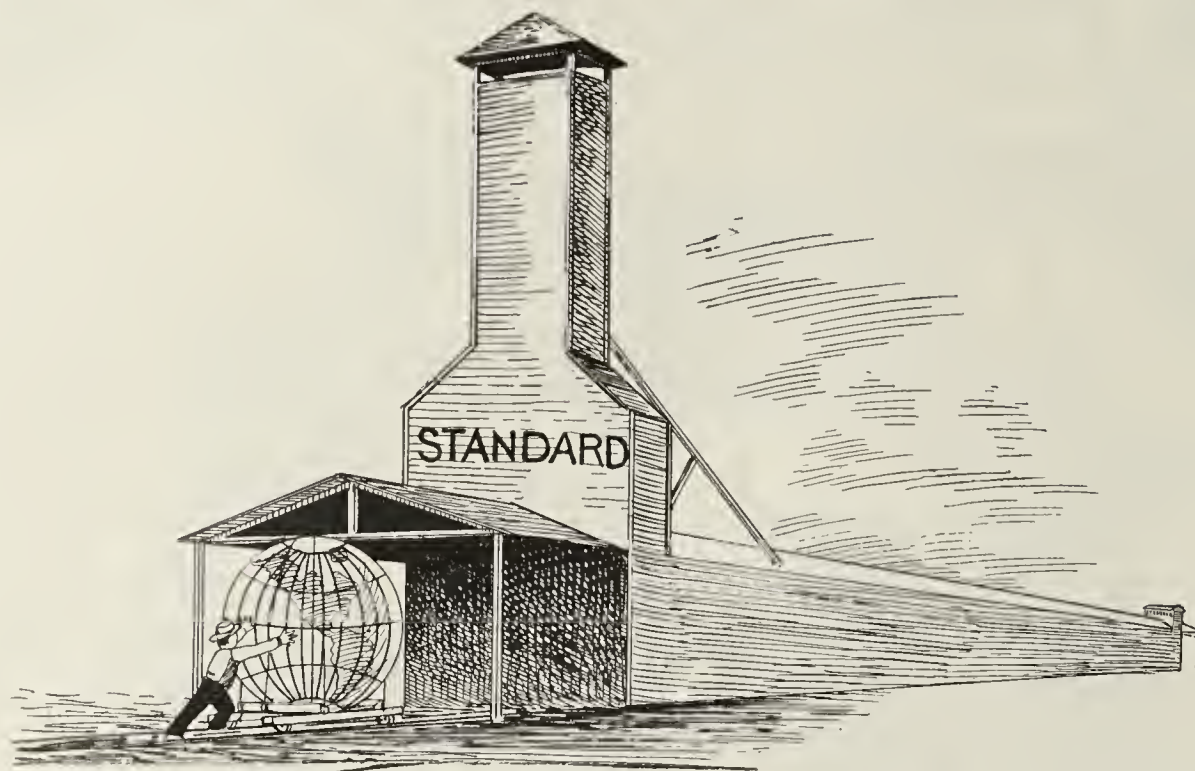


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WILL DRY THE EARTH.

Not all in one chunk, perhaps, but taken in sections, in the form of brick, or tile, it will dry a greater percentage of it and do it **better, quicker** and **cheaper**, than any other artificial drying system on the market.

This is a very broad claim, but we believe the record of **The Standard Drier**, as made up by users, warrants us in making this assertion.

There may be—there probably are, other good Driers, but that

## The STANDARD IMPROVED

## BRICK AND TILE DRIER

Is a good Drier, is proven by the testimony of its many users. If you are interested in the subject, let us send you some letters from people who are using it. They will give you a pretty good idea of how it is working on different kinds of clay, in different parts of the country. That's the best way to determine the quality of an article—find out what those who are using it, think of it.

There are some things that a Drier is not supposed to do, but it should dry clay products, and do it right. This is what the "**Standard Drier**" does, and what it does, it **does right**. You take no chances in buying "**The Standard**." We tell you beforehand what it will do with the kind of clay you are using, and guarantee it—making payment for the Drier contingent upon its ability to do what we say it will do. Isn't that fair? What more could you ask?

Send for catalog, illustrating and describing our system, also book of testimonials.

# The Standard Dry Kiln Co.,

186 South Meridian Street.

INDIANAPOLIS, IND.



# THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX.

INDIANAPOLIS, IND., NOVEMBER, 1898.

No. 5.

Written for the CLAY-WORKER.

## PAVING BRICK FOR BUILDING PURPOSES.

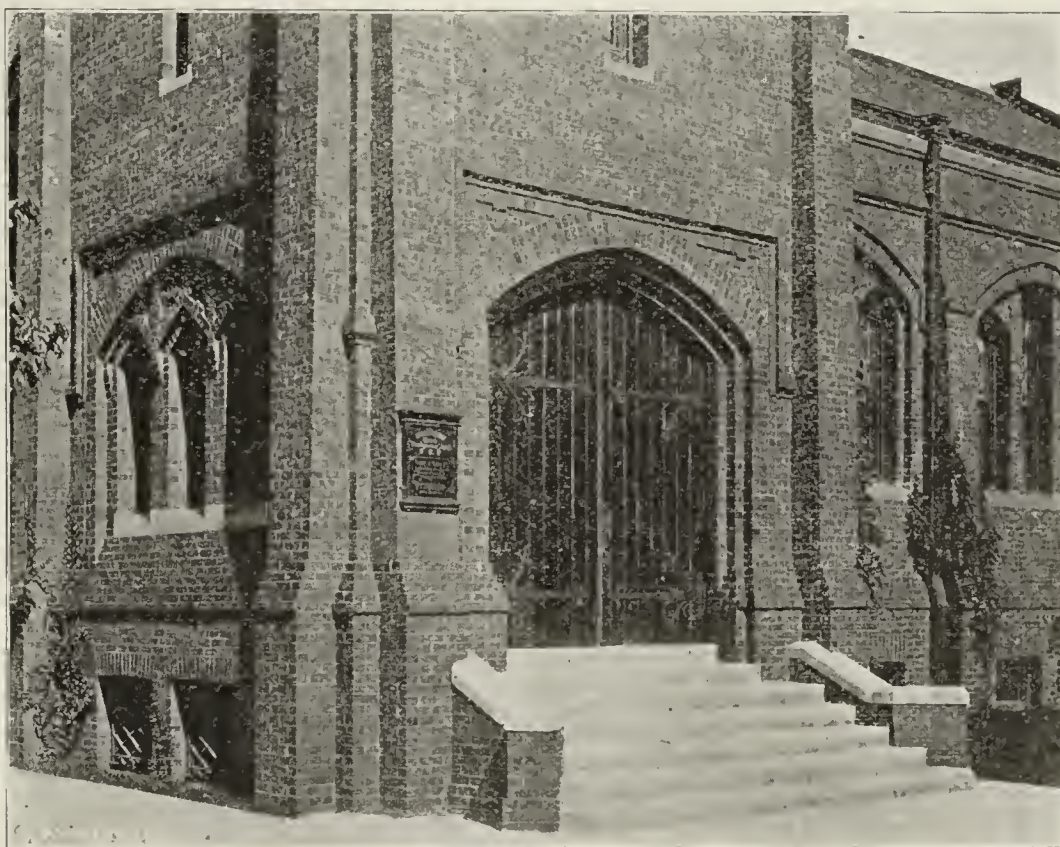
THE USE OF PAVING BRICK for building purposes in Chicago this year has been surprising in extent. No figures are at hand, but the writer can recall scores of structures, ranging from residences to important public buildings, in which the pavers were used for face brick. Strictly speaking they are not pavers for they have square corners and are made for building purposes, but they practically the same, namely, stiff-mud side-cut vitrified brick, and they are manufactured by the paving brick people who recognize them as a growing feature of their business. These vitrified brick are distasteful to contractors (at first they fought hard against them) because they are heavier than pressed brick, and having no suction are slower to lay even when some cement is used in the mortar. These vitrified brick are attractive to architects however, because (1) they are pleasing in color and texture, though sometimes an objectionable glaze is perceptible; (2) they are proof against dampness; (3) no trouble is feared from efflorescence, and (4) they are cheaper than even poor pressed brick. The last consideration is the one that "goes" in many cases, so far as the owner is concerned. For example in the case of a \$7,000 colonial house just completed, the owner could not have been induced to use this brick had he not found that good pressed brick would have cost \$300 more. He is pleased with the result however, for a rough brick is more pleasing ensemble, than single brick in sample. Another case illustrating the last point is that of the church, photographic half-

tone cuts of which accompany this article. The building committee had their hearts set on stone for exterior walls. Considerations of economy ended in the use of brick and now they are so proud of the result that they print at the head of programs, etc., the name "The Brick Church" or "The Brick Church Sabbath School."

Paving brick had been used in a few residences previously, but the brick men say that the inspection by many architects of this church which was completed in 1897 was what led to such generous use of vitrified rough brick this year in Chicago. The building, or group of buildings, consisting of church, sabbath-school and parsonage, was erected by the Woodlawn United Presbyterian congregation. The architects are Waid & Cranford of Chicago and New York. While the design is gothic it will be noticed that there was not a single moulding used. No stone trimmings were used except the sills and copings. Even the water table and buttress caps are plain brick, and in such cases care was taken to use cement mortar so that the joints would withstand the elements.

As to color the photographs do not even suggest the agreeable effect

obtained. The "body" color is a rich red while mullions and quoins around all the openings, band courses, water table and the entire base below water table are laid up in dark chocolate brick. The colors of this class of brick now in the market range from light red thro shades of purplish red to dark brown. The prices delivered in Chicago vary from \$9 to \$12 per M. according to selection. In many cases architects desire the variegated effect obtained by using the brick "kiln run," chipped corners and all. One point of interest in connection with church re-



ENTRANCE TO "THE BRICK CHURCH," CHICAGO.



ferred to is that whereas the contractor asserted that it would be impossible to cut such flint-like brick to make a decent job, it was found that a pressed brick layer's tools would cut the vitrified brick very satisfactorily. Some evidence of this can be seen over the triple window in the detail photograph.

The brick for this particular church were obtained through Bonner & Moore, 159 LaSalle St., Chicago, from the Barr Clay Manufacturing Co., Streator, Ill. Another large paving brick concern which supplies the building demand in Chicago is the Purington Paving Brick Co., of Galesburg, Ill. They furnished the brick for the Home for the Friendless which was pictured in the CLAY-WORKER sometime since. QUIZZICO.

Written for the CLAY-WORKER.

#### BUTTON HOLE TALKS.



HE WAS FASTENED tightly to my button-hole, and I couldn't pry him loose, so I had to make the best of it.

"Don't you ever deceive your wife," said he, impressively. I tried in vain to hinder his lecture till I could explain that I didn't know how, but he shut me up and continued:

"Last spring a little party of my chums made up a trip that was for pleasure only, and was expected to be just one long, unalloyed, joyous round of fun. I knew after all my lectures on hard times and economy that it would never do to tell my trusting better half that I was going on such a junket as that, and, indeed, I knew very well I could not afford it and ought not to go any way, but I was tempted and yielded. The way I yielded was through the suggestion of one of my companions, who is very cute indeed, and has been divorced twice, so I thought he had a full crop of experience. Now, I don't wonder at all that he has been divorced. The scheme hit me as being very funny and smart, and I dove in. I chipped in with them and arranged for the biggest kind of a time, and then went home and explained that important business matters compelled me to go to New York for a week or ten days, explaining to my wife how I hated to be away from her and how I would take her if I could afford it, and if it was not that my time would be occupied with business every minute I was there. Then I carefully wrote a series of letters, figuring one for each day I was supposed to be there, and sent them to a friend in New York, with full instructions as to when to post each. What with getting these up in good shape and with celebrating and planning with the boys, my time was pretty well occupied until the very day and hour of our start, when a sudden flurry of the market put one of my friends on the anxious seat, so he couldn't even stop worrying long enough to eat. The sudden death of a near relative fixed another. Some other calamity hit another, and, indeed, an unexpected turn in my business kept me so anxious that I thought of nothing but hustling to keep afloat, and dropped all thought of the trip, and kept 'treading water' at the bank.

"The third day after this I thought I noticed a strange look in my wife's eye, but she said nothing till the next night, when she sprung two of my letters on me—letters telling of my weary trip, but safe arrival in New York, dilating on how lonesome I was without her, and how hard I was working to get back quickly, and how I was working only for her, and thinking only of her, and homesick for her. The way her eyes flashed was a caution to comets. I ran my thinking apparatus overspeed and at high pressure, but could not grind out any satisfactory excuse. When I could get away for a minute I sent a rush message to my friend to quit sending the letters, but he was away, it seems, having delegated the duty of posting the letters to the office boy, and that boy was as faithful as fate.

"Every night for a week my wife met me with that light in her eye and another fool letter in her hand and, seating me

where I couldn't get away, read me a new lot of gush, pausing frequently to look me over and interpolate foot-notes and comments. Before the last letter came I got to feeling so small that she had trouble in finding me at all. Now she has the bunch of letters tied with a green ribbon, and the very mention or thought of the accursed things makes me feel sick and faint, and I am not on speaking terms with that fool friend who got up the scheme.

"No, my boy; don't deceive your wife. No, nor—but say," said he, standing up and looking me over from head to foot, "you couldn't deceive your wife anyway. You couldn't deceive anybody." I wonder what he meant. GATES.

Written for the CLAY-WORKER.

#### CAPITAL BRICKS AND MORTAR.

THE LAMENTED George W. Childs once said that he believed Washington property to be the soundest in the United States, and a good thing in which to invest money. This statement was made some years ago, when business was in a somewhat better condition than at present, but also when the population of Washington was nearly fifty thousand less than it is now. If a city's growth in population is an indication of its progress—and it is—then the Capital has been steadily adding to its wealth. An increase in population means an increase in houses, in real estate transactions and the putting into circulation of money. Washington, as is well known, is a city of homes, rather than a place of extensive manufacturing industries. The man of wealth comes here and builds a palace; the poor man owns or rents a small brick dwelling. A large number of the twenty-one thousand government clerks, who receive in the aggregate about \$1,500,000 every two weeks, either own or rent houses here, since the civil-service law has given them a more secure official footing, many of them renting houses with the understanding that the rent paid shall later be counted as purchase money when the house is bought by its occupants.

And so the city, with its nearly three hundred thousand inhabitants, is spreading out towards the suburbs, where property, now worth in many places between one and two dollars a square foot, could a few years ago be bought for from five to twenty-five cents per foot.

Not a few wise men in years gone by saw the "Klondike" nature of Washington real estate, and invested heavily in such "futures." Among these was ex-Secretary John Sherman, who owns property in and out of the city; and who, through his keen business foresight, has become a millionaire. He, with his brother-in-law, bought, some years ago, a million feet of land on Columbia Heights in the District. A few thousand dollars were paid for his property, which is worth many times the amount given for it.

John Sherman has been not only a money-maker from real estate, but has been a builder of houses and an improver of the Capital city. His dwelling house here is of very attractive appearance, and is constructed with a view to comfort as well as beauty. It cost about \$100,000. Besides this mansion, the ex-Secretary has built quite a number of smaller houses, from which he derives a handsome income. One of his speculations in property was the purchase of the house in which Edwin M. Stanton once lived. For this he (Sherman) paid \$35,000, and, holding it only a few months, sold it at a large profit, a goodly portion of which ultimately found its way into the pockets of the brickmakers and contractors.

It is not strange that Washington should attract men of large means, and that they should wish a residence here is reasonable enough. The city is healthy, clean and beautiful; and then the annual gathering of national lawmakers furnishes an inducement for residence, especially in winter, that the man of large business interests, which may have one end of their strings at



the Capitol, is fully aware of. So they come, and pile up bricks and mortar in many fine shapes in the regions of the bon-ton—the western portion of the city.

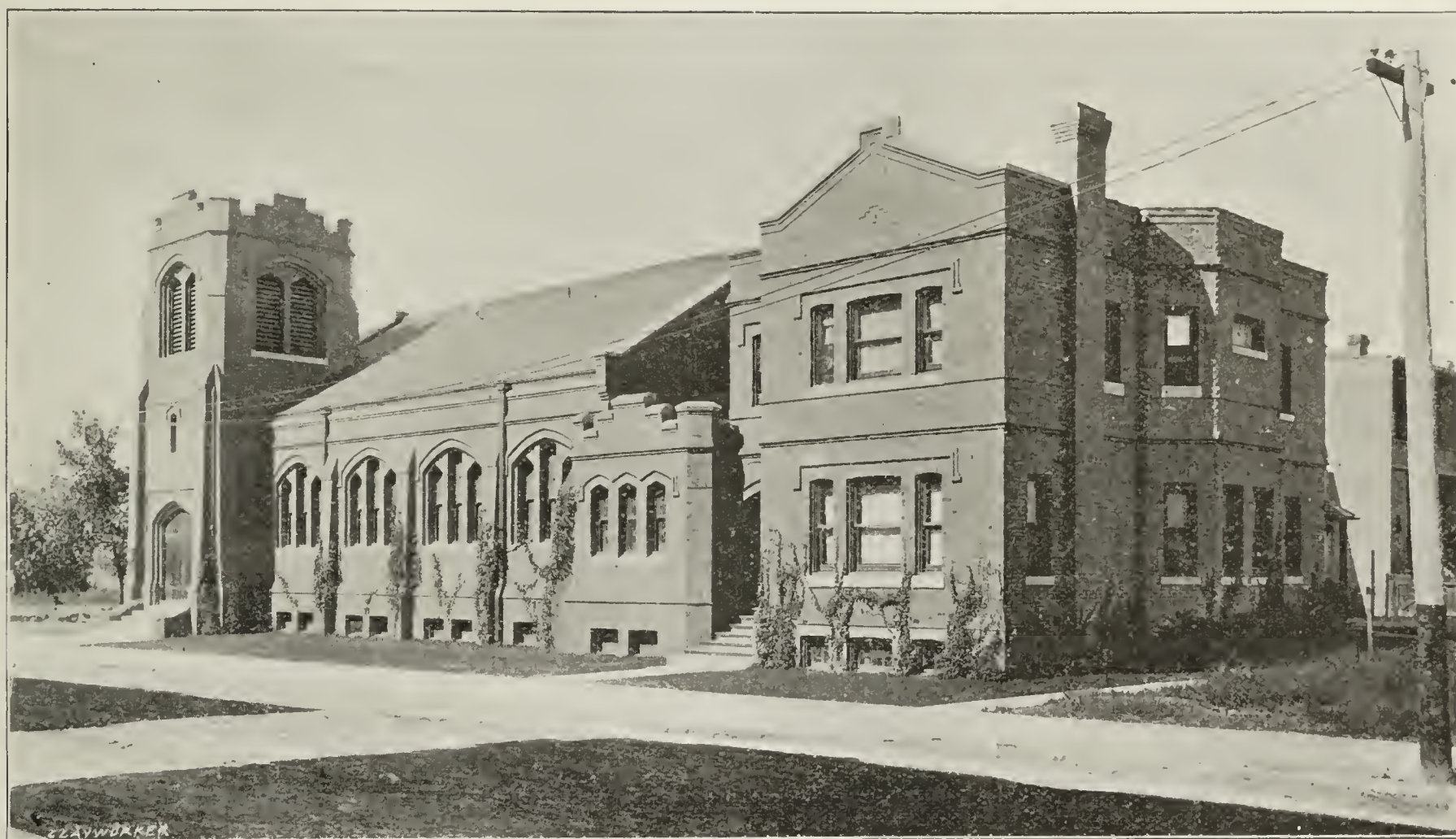
And the congressman himself has in many instances found profit in Washington bricks and mortar, following the example, in a measure, of one of the most illustrious of them—John Sherman, of whom we have just been speaking. Blaine's house, on Dupont Circle, cost that great statesman \$80,000, and, although it was not built for speculative or money-making purposes, it is said that there were gotten for rent from it more than \$10,000 a year. This was paid by Levi Z. Leiter, who seems able to pay anything demanded.

Sunset Cox, once minister to Turkey, and for several terms member of Congress, where he was conspicuous for his wit and eloquence, invested in Washington property, and out of one such investment made \$20,000. This, of course, was accomplished by disposing of his purchase. Don Cameron has also been a successful buyer and seller of land and bricks and mortar in the country of his senatorial labors. For \$40,000

a brown-stone front on Four-and-a-half street, which cost a goodly sum, and others in the aristocratic end of the Capitol building are finely housed.

Ex-Senators VanWyck and Sawyer owned houses in Washington which cost \$100,000 for each mansion, and not a few others who have sat beneath the dome of the Capitol and since gone to other fields of usefulness, have left great sums of money piled in brick and mortar where they would be surest of growing larger as time goes on. And these men made no mistake in thus investing their cash, for Washington, like all great capitals, must grow and gather wealth, as well as wisdom and knowledge, from various parts of the country whose seat of national government is here.

But perhaps the most prosperous period of building and real estate business ever seen in the District of Columbia since the time when George Washington stood on Capitol Hill and said that that was the place to build the Capitol, was during the first presidential term of Grover Cleveland. Then the boomiest boom that ever struck the town just swooped down and scat-



"The Brick Church," Chicago. Waid & Cranford, Architects, Chicago and New York.

he built a large red brick mansion on Dupont Circle, and later sold it for about \$95,000. The Camerons are a money-making people, and the latest of the family in the United States Senate seems to have found the dollar with more ease than any of his relatives.

If there is the personification of dignity and greatness in a legislative body, surely it can be found in the upper house of our national Legislature. And, this being the case, it is only natural for the United States Senator to desire an elegant home. With many of the solons this desire can be easily gratified, for they possess shekels in abundance—such abundance that the \$5,000 obtained from Uncle Sam for services rendered can be given to their better-halves as a small portion of their pin-money. Quite a number of Senators own their Washington homes, and some of these are types of elegance outside and in. The most of them were built several years ago. Senator Allison's (the leader of the Republican side of the Senate) home cost about \$30,000; Senator McMillan, the Michigan millionaire, paid about \$80,000 for his; Senator Morgan, of Alabama, member of the Hawaiian Commission, owns

tered dollars everywhere. The real estate man laid awake at night to study out fairy tales of fortune for his customers; the wheels at the brickyards burnt the wind, and the sound of the trowel, the hammer and saw was heard uproariously in the land. The property-buying fever was on the people, and they bought city property and country property.

Old farms in various parts of the suburbs were purchased, cut up into streets and lots and sold for many times their value; street-car lines were pushed out into the woods, and soon the home of the potato and the pumpkin was occupied by the village, which, in turn, was occupied (principally) by the government office-holder; for to the latter class the real estate agent related his fairy tales with marked success. To those who built houses on their suburban purchases the boom was a boon, for living in the country is cheaper than in the city; and not a few disposed of their little purchases at a profit. But, when the bottom fell out of the boom, hundreds of land-owners (50x150 lot possessions) had land titles to be transmitted to their children, for they could not sell them—the titles, not the children.

Among the fortunate buyers of real estate during the first



period of the Cleveland regime was Cleveland himself. His purchase (Oak View), when sold by him, brought a profit of \$100,000. About this time Cleveland's Secretary of the Navy, Whitney, made about \$75,000 from a tract of land which he had previously bought.

After this great boom in building and real estate transfers, business in these departments took a "back-set," and so remained for several years. But, notwithstanding this, there has been for sometime a steady, healthy growth of the city, which, there is little doubt, will continue and increase as times throughout the country get better.

Speaking of buildings in the District reminds me of an action not long since taken by the District Commissioners in regard to party walls, which directs the building inspector to issue permits for building outside the city limits, with the right to the party wall privilege. This right has heretofore been denied builders. But the matter was brought up in court, and Judge Cole, of the Circuit Court, in a suit to compel the users of such a wall to pay for their part of the cost of same, held that this portion of the city's building regulations applied also to all parts of the District of Columbia outside of Washington.

The law governing such regulations in the District dates back to 1791, when, on October 17 of that year, President Washington, under an act of the Maryland Legislature, established rules and regulations for material and manner of building and improvements in the Capital city. NICODEMUS.

### STRANGE STREETS.

The streets of Pekin, China, are unlike those of any other known city, says the Rambler. "They are hollowed deep below the houses on either side, and, as they are never repaired and the traffic is enormous, they tend to get lower and lower. Heaps of filth in places absolutely block the tracks, side by side with flaunting, gilded shops stand squalid, wretched shanties, rotting to the ground, in some cases fallen and helping fill the streets below. In dry weather the town is a gigantic dust-bin; in the wet season, a whirling cess-pool.

"It rains in Pekin with greater fury than almost anywhere else in the world. The result is that these hollow paths become in an hour or less a raging torrent, in which every year at the breaking of the rains many men are drowned. Two Europeans, though on horseback, being caught in a severe thunderstorm, narrowly escaped with their lives, and heard afterwards that the corpses of about seventy men and women and children had been picked up after the storm was over—drowned in the very streets of the city."

### PHILADELPHIA BRICK MACHINERY TO CHINA.

Almost every day brings report of some new disturbance in the affairs of China, with a promise of more to follow, so that it is not surprising that among the innovations of Chinese customs in the near future should be numbered the introduction of a "Chambers Bros. automatic end-cut brick machine."

Mr. J. H. Chambers writes his company has received the order for an outfit to be erected immediately near Hong Kong, and that the order is clearly traceable to an advertisement they made some ten years ago. While it has been a long time in bearing fruit in the celestial empire, it serves to illustrate

the advantage of advertising in mediums of sufficient character and value to secure preservation.

The Clay-Worker is a medium of this kind, although much of its fruit to advertisers ripens in less than ten years.

Written for the CLAY-WORKER.

### BRICK PAVING AND FILLERS.

Notes from Des Moines, Gleaned from the City Engineer and Other Experts in Paving Material.



IN A PREVIOUS ARTICLE, published in the Clay-Worker, September issue, it was stated that Des Moines has eighty miles of streets paved with brick. All this paving has been done under the law providing for the assessment of abutting property for all street improvements, such assessments being payable in seven yearly installments.

Property owners naturally became interested in the quality and durability of the paving put down in front of their holdings, and a vast amount of critical observation resulted. But the experience obtained has been dearly bought. The property owner well recollects that much of the cedar block put down was scarcely paid for, on the seven-year plan, before it became necessary to repave the streets, and it began to look as though paving was to become a continuous tax upon abutting property, if the life of such paving was only seven years, as the cedar block proved to be.

Fortunately, good paving brick came to the front about this time, and its manufacture was another thriving industry for Des Moines, constantly growing in volume and giving steady employment to hundreds of citizens.

Partly from patriotic motives, and partly because of the



West Grand Avenue, Des Moines, Ia. Two courses of Brick on Sand. Laid by Des Moines Brick Mfg. Co., August 1897.

cheapness of brick, compared with asphalt and granite block, neither of the latter named materials have ever yet found a foothold in this city.

Under the system in vogue, parties who foot the bills have a voice in the kind of paving put down. The majority of property owners on a street, by petition to the City Council, determine largely whether the paving shall be of brick, asphalt or granite, and, if of brick, whether the foundation shall be of sand with two-course brick, or concrete, and whether the filler shall be of elastic or rigid material—sand, cement or tar.

It goes without saying that the majority of property owners are sagacious business men. They weigh carefully all the elements of cost, durability, smoothness and cleanliness. In regard to the first item, that of cost, they have found that the apparently cheapest pavement does not always prove to be the



cheapest in the end. Cheapness is not the only desideratum. If it was, a sand foundation and a sand filler would answer every purpose. We quote the City Engineer's report for 1897 again, to emphasize the point sought to be made clear. He says: "The average life of brick paving on the down-town streets is from twelve to fifteen years, and upon the residence streets from twenty-five to thirty years." Now, under the system of assessment, the longer the pavement can be made to last the cheaper it is to the property owners.

It has been demonstrated to them that the life of brick paving is not solely governed by the quality of the brick used. Certainly all brick is carefully inspected by competent experts when put down, and, before any filler is laid on, a seven-ton roller is passed over the pavement. After the passage of the roller an inspector follows, and marks every crushed or defective brick with white chalk, and they are lifted out with a

Portland Cement.—This is a "rigid," and is at present on trial, with results favorable so far, but until the effects of freezing weather are known it would be premature to judge of its utility. It is mixed with sand on a basis of 1 to 1, and is much cheaper than some other kinds of filler. It is highly endorsed by the City Engineer, who believes that in this material has been found the ideal filler, from a utilitarian and sanitary standpoint.

The filler that has found most favor in this city is known as Murpny's grout, and is a secretly mixed composition which looks much like Portland cement, with added ingredients giving it a whitish appearance when put down and dry. The gravest objection to this filler is that it costs nearly twice as much as plain Portland cement, and this has led to the trial of that commodity in the hope that it will answer as well.

Both the above are termed "rigid" fillers, and are subject to the objection that they will not permit of the necessary expansion and contraction of the paving induced by atmospheric conditions.

In hot weather something must give or the pavements gets a hump on itself, and sounds hollow and drummy. A new scheme has been inaugurated to obviate this, and it is understood has proved successful on Minneapolis paving. It is to leave a half-inch joint about every 50 feet and fill the same with asphalt, which is elastic enough to give the necessary play to each section of paving. With this innovation, experience leads our officials to believe that a good rigid filling that will



West 5th Street, Des Moines, Ia., one course  
Brick on 6 inches Concrete. Laid by  
Des Moines Brick Mfg. Co., 1892.

pair of tongs, and good brick substituted. The pavement is then ready for the filler.

The filler cuts an important figure, and various kinds have been used with the purpose of educating the people as to which is the best. All paving specifications used by the Board of Public Works provide for any one of five different kinds of filler, viz.:

- Sand.
- Portland cement.
- Murphy's grout.
- Tar.
- Bituminous grout.

In determining which of these proves to be the best all-around filler, several points have to be taken into consideration. We will consider them in the order given.

**Sand**—Has in its favor cheapness, while against its use many objections are made. No matter how good the brick, it needs protection, and sand does not give it. It must be protected from the strong streams of water turned on to it during the flushing process of cleaning the streets—a favorite pastime with our present civic officials, and it must be protected and the edges of the brick held up to prevent chipping off, an item which slowly but surely leads to roughness of surface and ugly disfigurement of the paving. Sand with us is a back number, and has been virtually discarded.



East Grande Avenue, Des Moines, Ia. One Course of Brick on 6 inches Concrete. Laid  
July 1892, by Des Moines Brick Mfg. Co.

fill up every crack and hold the edges of the brick solid against the inroads of both water and the calks of horses' shoes is by all odds the best. It gives durability, smoothness, and with the system of flushing the streets, cleanliness to the paving.

Another point in favor of the rigid filler is that it renders brick paving sufficiently smooth to make travel on the wheel a pleasure. In fact, experienced wheelmen who have tried asphalt and the modern brick paving say they prefer the brick every time for the reason that asphalt is too smooth and holds the rubber tire with a kind of suction grip, giving a much greater resistance than brick, and requiring more energy in consequence to travel.

The elastic fillers, tar and bituminous grout, are all right in



localities where the thermometer never touches the 100 degrees mark, but here the warm rays of the summer sun cause the tar to bubble up from the cracks and run over the paving, causing horses to slip and rendering travel disagreeable and dangerous, especially on grades. For this reason it has been discarded here.

The accompanying illustrations of three of the brick-paved thoroughfares of Des Moines show that both sand and tar have been tried. West Grand avenue and West Fifth street both have tar fillers, and East Grand avenue has sand.

After much experimental work, with eighty miles of brick paving laid, the conclusions arrived at by our best posted people are that the ideal paving is a good sand foundation well rolled, two course brick, properly inspected, and the whole covered with a good rigid filler.

#### CEMENT—MACADAM.

**A**N EXPERIMENT has been made with this new paving in Berlin. The paving is made by first putting down a bed of concrete, on which, when sufficiently hardened, the cement macadam proper is spread. The latter consists of crushed stone, about the size of a walnut, and Portland cement, with very little sand, four flat shovels for three or four sacks of cement. It is prepared by putting the crushed stone on a platform together with the few shovels of sand. Then the mass is first mixed dry by shoveling, and then wet under the plentiful addition of water. Finally the mixture is thrown upon the concrete and tamped solid. As soon as this is done the surface is rubbed with a board, and the uneven places are filled with the cement mortar. By means of a roller a rifled surface is given to the paving. When finished, the macadam is covered with sand to prevent too rapid drying, and it thus remains from ten to fourteen days.

Although the cement macadam has been subjected to traffic only three or four days, it has already been badly damaged where heavy freight is passing over it.

Aside from the wretched durability of the paving, it is not suited for the busy streets of Berlin, since it makes necessary a long delay for the purpose of drying the macadam. The short stretch on Invaliden street, a piece about 300 feet long, required about four weeks' time, including the time of hardening. Such a long-continued obstruction of traffic might be tolerated when there is an assurance that the pavement is really durable and where it need not be disturbed for some time. But where gas, water and compressed-air lines, as well as electric cables, require constant repairing, the replacement of the cement macadam would be found inconvenient and expensive, in addition to the poor durability.

A pavement which does not show any of these disadvantages is the brick pavement. Brick made from shale, properly made, burned and annealed, give a street pavement which is cheap, durable, needs little repairing, causes comparatively little friction, and is not noisy.—K. Duemmler, in the German Brick and Pottery Gazette.

#### CLAY BOARDS.

George L. Feltham, of Brunswick, Me., has applied for a patent upon a new process of making boards for buildings. He is going to make them of sawdust and clay. He says that he can make boards that will last forever, and will cost only one cent each to construct. The sawdust is to be put into great digestors and boiled down to the consistence of flower paste. Then it is mixed with a certain percentage of common clay mud, which makes it air tight. No air works through these pasteboard houses when they are constructed. Into this thick mass of pudding is to be mixed "vegetable glue." The stuff is rolled out into sheets and dried, after being pressed between

immense rollers, till it is as hard as a board. It is then ready for use on the walls of the buildings. Nails are driven through it as easy as through a maple board, and it is about as heavy. —Bangor Commercial, Oct. 27.

Written for the CLAY-WORKER.

#### PAVING BRICK IN NEW YORK CITY.—No. 2.

—Brick Pavements Growing in Popular Esteem.—



HERE IS NOW a good hope that under the new administration of the consolidated Greater New York, together with the several successful experiments which have been made by the officials of the late city of Brooklyn, that the use of brick pavements may become popular.

The several contracts which have been supplied by the different manufacturers, including Canton, Ohio, Pittsburg, Pa., Johnsonburg, Pa., West Virginia and Catskills, N. Y., have in the main proved more than satisfactory, and will doubtless lead to a more abundant use of this material for the repaving of the streets in all of the cities now incorporated with New York.

A very recent examination of all these several experimental pavements, made especially for the Clay-Worker, shows that a very large majority of them are composed of excellent vitrified brick, of uniform color, hardness and form. The preference is clearly in favor of the red shale brick, which is rea-



Street Intersection, Brooklyn.

sonable, because to common people the red color indicates a greater proportion of metallic quality. There are, however, some points which need the most careful consideration of every paving brick manufacturer. The object of these observations is to render assistance to the brickmakers in general, and not to advertise any particular make of paving brick, therefore, in speaking of the work reference will only be made to the locality of the pavement under criticism.

—Quality of Brick Supplied.—

If brick pavements are ever to become popular in New York, it will be absolutely necessary for every brickmaker, who may obtain a contract, to ship only the very best for use on the streets of this city. First, because the traffic is very heavy and constant, and secondly, because the "asphalt ring" will most surely advertise every example of an inferior brick pavement, if there be any. All of the streets are constantly used by fast carriages and delivery wagons, with narrow tires and rapidly striking horses' feet; also with heavy coal and merchandise trucks, carrying loads of five tons, drawn by heavy horses shod with sharp calked shoes. Good brick pavement is fully competent to sustain all this reasonable traffic and to excel any



of the more commonly used materials now in use. Every paving-brick maker will therefore realize that in order to meet this test it is imperative for him to ship only his best goods into this market, for, if his material should fail, he would not only ruin his own reputation, but also inflict a gross injustice upon his fellow craftsmen, who are both able and willing to adequately sustain the reputation of paving brick as the best, very best, paving material.

—Imperfectly Burned or Porous Brick.—

It may not be safe to assert that a brick which will take in or absorb a given amount of water is not a good brick for paving; but there is always a great risk in using such brick,

amount of wear which would be a disadvantage in a paving brick. While observing this pavement closely the driver of a carriage volunteered the remark, "That's no good." I asked him why he thought so. He replied that he lived upon that street, and that the snow and ice packed and remained there long after other pavements were clean. Also that it was too noisy, sounding like a train going over a bridge whenever a wagon passed rapidly over it; that the noise was worse inside the houses than in the street. His remarks about the snow and ice were consistent with a porous brick, and this, together with the gritty appearance, would indicate that these brick were of that quality. A porous surface will retain snow and ice because of its ability to hold the water released by the noon-day



BRICK PAVEMENTS IN GREATER NEW YORK.—1. Approach to Highland Boulevard, Brooklyn. 2. Nevins Street, Brooklyn. 3. Photograph of a Mixed Brick Pavement, Brooklyn. 4. Pennsylvania Avenue, Brooklyn.

for close observation frequently indicates that the brick which fail are of that character.

The accompanying illustration is made from a photograph taken after a severe rain storm, when the pavement had been washed clean. The sharp contrast in color is due to the fact that many of the brick were of a porous quality. This variation in color led to a closer examination of the brick, when it was found that the light-colored or porous brick were badly chipped and the joints were full of loose pieces. There is reason to fear that this pavement will too soon afford an object lesson for the use of the enemies of brick pavement.

—Friable or Gritty Brick.—

Gritty brick are also undesirable. While making an examination of a very good-looking specimen of light-colored pavement, the apparent grittiness of the surface suggested an

sun, until the shadows fall again, when the water is again frozen into ice and the mass is constantly renewed, whereas with a vitrified surface the water will pass away at each melting and the mass of ice be reduced.

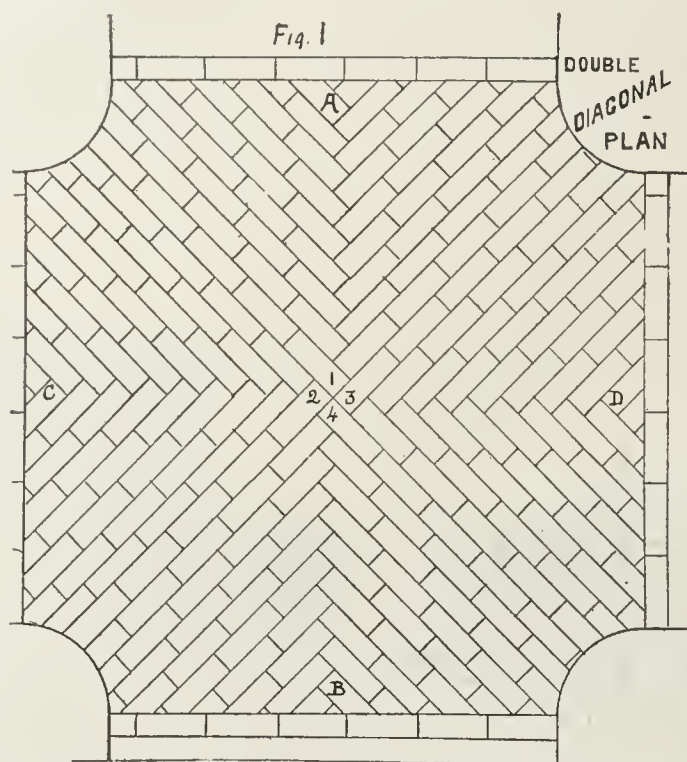
—The Construction of Brick Pavements.—

If any one good feature of brick paving in Brooklyn is more prominent than another, it is the excellence of the construction, and the evident careful supervision that has been given to the manner of laying these brick pavements. In the first place, the streets have been very carefully graded, and then covered with a substantial coating of cement and crushed rock concrete; upon this foundation the bricks are bedded in sand, and the joints appear to have been grouted with cement mortar. Upon Pennsylvania avenue and Highland boulevard the pavement has been so skillfully and regularly laid that it looks

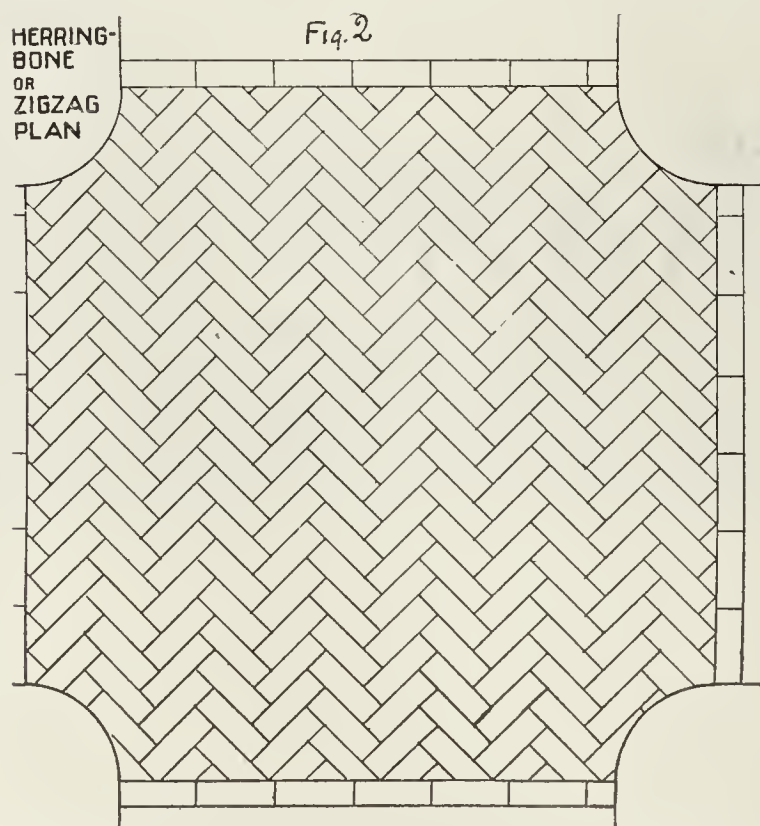


like a fine example of old Roman Mosaic pavement, the dark red shale brick and the grey cement joints forming a pleasing contrast far more agreeable than any other paving material can furnish.

Proceeding along Pennsylvania avenue, crossing Jamaica



avenue going toward Evergreen Cemetery, at the sharp incline turning toward Highland Boulevard, especial care has been exercised to prevent the washing out of the joints. The brick are laid in herring-bone or zigzag courses, carefully set in cement and joints grouted. These several intersections upon Pennsylvania avenue are very difficult, owing to the steep gradient and the curved hillside, and here can be seen a good example of skill and workmanship in laying of brick paving. It is an evidence of faithful work by the engineer of highways, the contractor who constructed it, and the brickmaker who supplied the brick, each of them did all that could be done



to make this pavement a good one, and they have succeeded.

The laying of paving brick at the

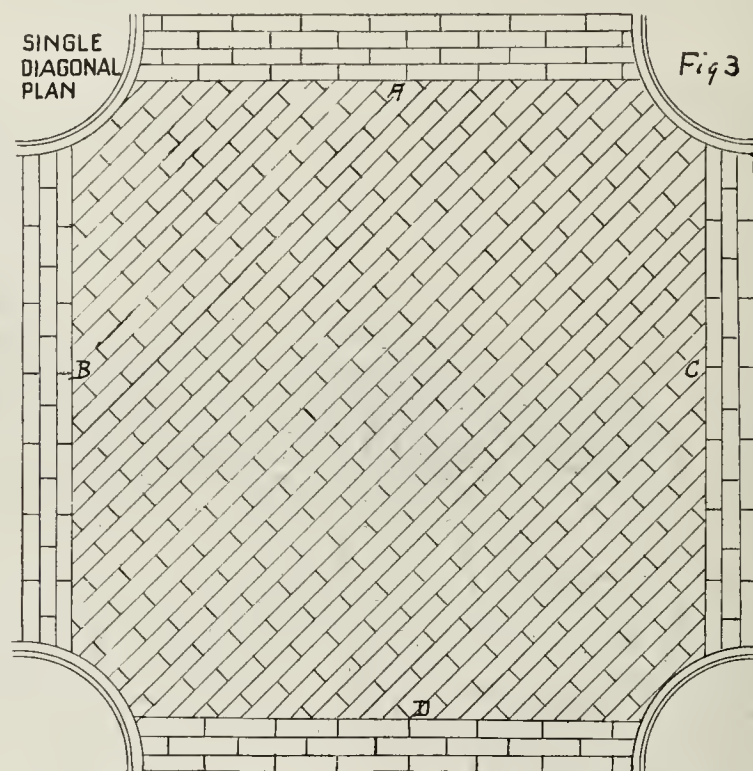
—Intersections of Streets.—

This is one of the most important details which will determine the future success of brick pavements. A careful and extended investigation of the brick paving of Brooklyn shows conclusively that no recognized method has as yet been made a rule of practice. Nearly every cross intersection has been laid in a different manner. There must be some best way, and to help those who are engaged in this work I have prepared some simple sketches to illustrate the several methods which

may lead them to think out some system for general acceptance.

—The Double Diagonal Plan.—Fig. 1.—

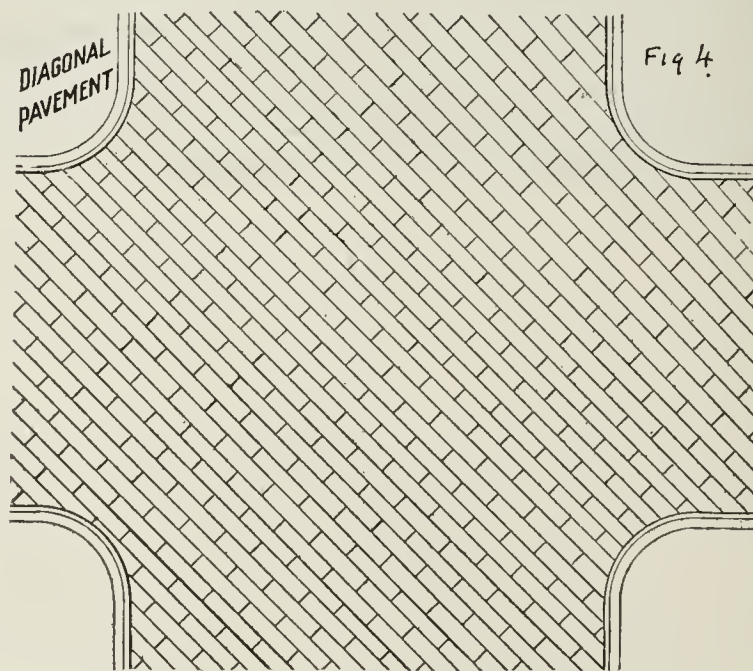
This sketch illustrates what appears to be an expensive and at the same time the least satisfactory method. It is taken from an actual work in Brooklyn. Its chief fault consists in exposing the ends of too many brick ends to undue service without any support from brick centers. By reference to the sketch a line drawn from A to B, or from C to D, will show what is intended. The same is in a greatly aggravated sense true of the central bricks marked 1, 2, 3, 4. A heavily loaded



wheel passing over this point of intersection, which is in the center of the street and therefore the most exposed to wear from all directions, will press upon the corners of four separate bricks, causing them to tilt and become loose and liable to damage. This a fact not a theory, for in the pavement referred to there is a hole in the center fully two feet in diameter in which the bricks are broken and crushed to fragments, thus making a fatal blot upon what in every other respect is a good pavement.

Another costly but somewhat better method is shown in some other intersections of important streets in Brooklyn, as illustrated in Fig. 2.

This sketch shows that the central fault of the preceding



method is avoided, but that there are more numerous straight rows of brick ends left without any support from brick centers. It is difficult to see what good purpose is served by either of these fantastic methods of connecting intersecting pavements. They may be considered pretty, but certainly their beauty is only skin deep and like a flower, it soon perishes.



It is important in laying brick for paving to avoid as much as possible any liability to movement. Any motion will surely lead to loosening, and that means breakage and destruction. Therefore the object should be to distribute the friction of the wheels as much as possible upon the centers of the brick.

A third and more satisfactory plan for laying these intersections is also used in Brooklyn, and as the sketch on Fig. 3 indicates, it is free from the faults of the two preceding systems so far as the central portion is concerned. In it every brick end is supported by the brick centers of each preceding and succeeding course, so that there is very little liability to damage; indeed, it is in this respect a better surface than the main portion of the street. This plan of construction is the best that was found, yet it in common with the others has a very serious fault and a constructively weak point, which is found at the conjunction of the diagonal with the rectangular courses, one at each intersection, as A, B, C, D. The many cut brick and small pieces of brick used to make this joint have been found to sink down into the sand, thus forming holes which tend to an unfair wearing upon the surrounding bricks.

It is evident that neither of these three methods of paving is satisfactory or conducive to the stability of brick paving. It is also clear that they are due to a lack of sufficient considera-

Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 8.

Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

—Designs in Various Colors. Mostly by Unknown Makers.—

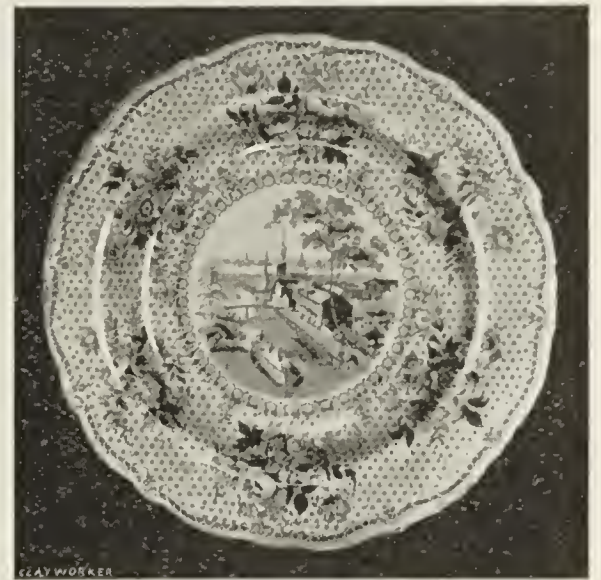
IT IS IMPOSSIBLE to sub-classify the large number of ceramic prints in various colors which occur without the names of the manufacturers. Many of the English potters appear to have issued but one or two American views, while others seem to have varied the marginal device with each subject treated. In fact, it is unusual to find two designs of this class which bear the same border. Some of these views are found only in a single color, while others occur in a variety of tints. For the reason that all of these ceramic prints, other than those in dark blue, were produced at about the same period, and it is possible that the majority of them may later be found to have been made in the full variety of colorings, it is not considered necessary to subdivide them in this respect. Occasionally, however, two colors are combined in a single



Merchants Exchange, New York Fire.



Lafayette, The Nation's Guest.



Erie Canal at Buffalo, (Lace Border). By Ralph Stevenson.

tion at the outset of laying the pavement, and are the outcrop of conditions which arise when intersecting masses of pavement come together. All of them necessitate the cutting of many bricks and the use of fragments and small pieces, a very objectionable feature in all brickwork. In considering this important difficulty I was constrained to submit to the paving brickmakers a plan, which is shown in Fig. 4, which entirely does away with those small pieces and cut bricks in the wearing surface of the pavement.

Sketch 4 clearly demonstrates that it is possible to get all the advantages of the "double diagonal," the "Herring-bone," and the single diagonal methods without being at all hampered with any of their several faults; by the use of what may be called the diagonal pavement.

In this method there are no cut bricks or small pieces used where they are exposed to the action and wear of the traffic. All the bricks are laid diagonal, and the only cut brick are at the edges next the curb of the sidewalk, where there is no possibility of severe usage. The surface is the same in every direction. There are no intersecting joints, and the traction surface is the easiest and best possible for brick pavement. By this simple method every brick end is supported by a brick center over the entire surface. Another advantage which is worth consideration, viz.: The courses being so much longer, one-third more men can be employed laying brick than with the rectangular method, thus giving a corresponding reduction of the time required to lay the pavement, and avoiding the loss of material and saving time in cutting of brick.

JAMES TAYLOR.

(To be Continued.)

piece, one being used for the central print and another for the border.

—Miscellaneous Designs in Black, Brown, Red, Pink, Rose, medium Blue, pale Blue, Green, Purple, Lilac or Violet, Mulberry, Gray, etc. Various Borders.—

Alabama, C. S. N. (made by E. F. Bodley & Co., Burslem, about 1862).

Albany, View of City.

Albany Theatre (1824).

American Flag, Liberty-Cap and Flowers (stoneware).

America Triumphant (so-called), Eagle, Olive Branch, Ship and Anchor.

Anti-Slavery (see Constitution of the U. S.).

Arms of the United States (colored by hand).

Arms of the United States (flow blue or brown on white), stencil border, by R. Mammersley.

Boston, Bunker Hill Monument

Boston, Court House.

Boston, St. Paul's Church (?).

Boston, State House.

Constitution of U. S. (First Amendment); Central Inscription. Eagle and Mott Border.

Constitution (U. S. S.).

Constitution and Guerriere, Fight between (Copper Lustre)

Fort Hamilton, The Narrows.

Fort Hudson, N. Y. (yellow).

Fort Niagara, Medallion and Flower Border.

Franklin (Flying Kite).

Fulton's Steamboat (so-called).

Harrison, W. H. (Log Cabin).

Little Falls, View of Aqueduct Bridge at.

"Mt. Vernon, Seat of the Late Gen'l Washington."

"Mt. Vernon" (Man and Horse in foreground).

Mt. Vernon (line Border).



Merchants Exchange, New York (burning). Phoenix and Engine Border.  
 Merchants Exchange, New York (ruins).  
 New York, Battery.  
 "Niagara."  
 Niagara Falls (large house in foreground).  
 "Pennsylvania," by K. E. & Co. (medallion border).  
 Philadelphia, Dumb Asylum (from engraving published by Hinton & Simpkin & Marshall, London, 1831).  
 Thorps and Sprague, Albany, N. Y. (title on face).  
 Utica, N. Y. (medallion Border).  
 "Virginia" (Monument), floral Border.  
 Washington, Executive Mansion (same Border as Dumb Asylum, Philadelphia).  
 Washington, Capitol at (floral Border).  
 "Washington, White House."  
 Washington crossing the Delaware (H. P. & W. C. Taylor, Philadelphia. About 1865).  
 Washington Monument, "Sacred to the Memory of Washington."  
 Washington Memorial (red and green); Border, Urns and Willows.  
 Washington Vase (pearl color, or flow blue).  
 "Washington" (urn bearing name), floral Border.  
 —Portrait Plates, probably by Enoch Wood, Davenport and others (all Staffordshire).—  
 Bainbridge ("Avast, Boys, She's struck").



Faulkstone Hall. Heads of Washington, Jefferson, Lafayette and Clinton. Collection of Mr. A. G. Richmond, Canajoharie, N. Y.

Brown (bust), "Major Gen. Brown, Niagara," view of Niagara Falls; Naval Emblems, etc.  
 Decatur ("Free Trade, Sailors' Rights").  
 Hull (bust), "Captain Hull of the Constitution," view of Ship; Naval Emblems, etc.  
 Jones (bust), "Captain Jones of the Macedonian," view of Ship; Naval Emblems, etc.  
 "Perry" (bust).  
 Perry (full length portrait).  
 Perry ("We have met the Enemy and they are ours").  
 Pike (bust). "Be always ready to die for your country." Naval Emblems, etc.  
 Lafayette (bust). Long Inscription, "He was born at Anverague," etc. Raised floral Border, colored.  
 Lafayette (bust). "Welcome Lafayette, the Nation's Guest and our Country's Glory." Embossed Border.  
 Lafayette and Washington (raised floral Border, red and green).  
 Lafayette and Washington (raised Border; splotches of color).

Note. These papers will be concluded in the January number of the Clay-Worker, and will be immediately republished in book form, after being revised and enlarged. The book will be invaluable to collectors and others interested in the subject,

since nothing of this nature, so complete and compact, has ever been issued. It will consist of about 150 pages and will contain nearly 100 illustrations of American designs, besides Scrip-



View near Conway, N. H. By W. Adams & Sons. See Clay-Worker for August 1898, p. 106.

tural, foreign and popular subjects, such as the Syntax, Don Quixote and Wilkie designs, many of them rare and some of them new to collectors. The designs will be numbered for convenience of reference, and the serial border devices will be classified to facilitate the identification of views. There will also be a complete index which will serve as a check list for collections. Those desiring copies will do well to forward their orders to the publisher of the Clay-Worker at an early date, as only a limited edition will be printed. The price has been fixed



Columbus (Fleet view, variety b.) By W. Adams & Sons. See Clay-Worker for August, 1898, p. 106.

at \$1.50 per copy. By mail, 10 cents extra to cover postage. Copies may be sent by express, charges to be paid at office of delivery.

EDWIN A BARBER.



Written for the CLAY-WORKER.

# A BRICK FACTORY IN A WOODEN TOWN.—No. 8.



FINISHING TOUCH to a kiln of brick is to seal it tight, both bottom and top. I have known brickmakers who put in the last fire, threw down their "pokers" and went home, paying no attention to one of the most important matters in connection with brick burning, viz., annealing. This subject needs no discussion here, but it might be well to admonish our brethren that they would make better brick, have less checks and breakage if they would be more careful in this matter of slowly cooling their ware. The poorly-constructed walls of most of the kilns one sees on the average brickyard are poor make-shifts for burning and equally as poor for annealing. All burned clay wares should be cooled slowly.

But the necessity is greater with some clays than with oth-



PORTRAIT FROM INTERIOR OF HARRISON BOWL.  
Courtesy of The New England Magazine.

ers. Some may be cooled in from four to five days; others may require twice this time in order that they may not show some damage from the cold air. Cold air is a great enemy to hot bricks. Exclude it from your kilns by every means you can invent, both while burning and cooling. Build furnaces on the outside walls, so that the cold air must become hot air by passing over the fires within these furnaces before reaching the hot bricks in your arches. In this way you will avoid much of the checked and broken bricks one generally sees in our up-draft kilns. I have during the past season, often had occasion to visit a neighboring yard where good hand mold brick are turned out but it is safe to say that more than one-half of his arch bricks are a total loss, because he pays so little attention to excluding the cold air while burning and cooling.

A kiln of bricks in burning becomes a great ball of fire. The escaping hot gases produce a partial vacuum which must be filled from the outside. The air exerts a great pressure upon the walls which surround this intensely hot mass, seeking for every crack and crevice through which to pour a cold stream, thus suddenly reducing the temperature of the bricks which it strikes, sometimes checking their surfaces, sometimes breaking them into two pieces, and at all times causing a loss that the careful burner will labor to reduce to the minimum. The subjects of sorting the bricks and selling them come next. If trade is very brisk we often load the bricks into the purchasers' wag-

ons, and have the kiln empty by the time we need it for refilling. But, unfortunately, trade is not always so brisk, and



Log Cabin Bowl, W. H. Harrison. (Interior View.)

then one must either build new kilns or empty the one already burned.

We finished emptying and sorting a kiln of seventy-five thousand bricks to-day. We sort them as we load them into the wheel-barrows, and wheel them about fifty feet from the kiln and stack them neatly, each grade to itself.

During the discussion of sorting bricks at the last National Brickmakers' Association, one prominent manufacturer of front brick stated that sorting his brick cost him one dollar per M. I do not question the truth of this statement, but it does not cost us one-half that much. The demands of his market are so much greater than ours that he may not have overestimated the cost. But, cost what it may, one must satisfy his customers, and lucky is he whose customers' tastes



HARRISON BOWL.  
Courtesy of the New England Magazine.

have not been educated to that degree that they demand absolute uniformity of color in front brick. Yet it pays the manufacturers to carefully separate the different grades of brick, so that each customer can select the quality that suits his purpose and his purse. The best of manufacturers will have some in-



ferior bricks, and one can hardly afford to throw them over the dump. Yet, for the sake of his reputation, he can hardly afford to sell them, for one is often judged by the poorest wares he makes instead of by his best. The culls should be placed in a pile to themselves and sold as culls. Never attempt to work them off on your customers by sandwiching them with good bricks and flatter yourself that they pass unnoticed.

Every brick thus sold is a greater loss than if it were dumped into the river. One poor brick in a load, or walk, or pavement attracts more notice than five hundred good ones surrounding it. Sell your poor bricks, if you can, without lowering the reputation or grade of your good ones; but, if you cannot do that, throw them away.

L. C. M.

### OBITUARY.

#### Joseph Joiner, Architectural Clayworker.

Since our last issue another of the foremost clayworkers in America has passed over the river whence none return.

It is with the deep regret of those who have lost an esteemed and kindly neighbor that we record the death of our friend Joseph Joiner. He was well known as a most thorough and enthusiastic clay-worker, trained and experienced particularly in the line of architectural terra cotta, in which branch of the clay-worker's craft he had been especially educated and for which he had a more than ordinary aptitude.

He was the nephew and adopted son of John M. Blashfield, the founder of the modern nascent mosaic tile and architectural terra cotta industry in England.

His early youth was spent in close association with Robert Minton, Digby Wyatt and Charles Barry, all of whom were pioneers in this century's revival of the clay-worker's art. Leaving school in the early sixties he at once entered the office of the Stamford Pottery, in Lincolnshire, England. Here he was surrounded by an atmosphere of ancient and modern art, and brought constantly in contact with the best specimens of sculpture, terra cotta at that time being almost exclusively used in reproductions of vases and statuary.

In the year 1864 Charles Barry, the architect of the Dulwich College, near London, decided to use terra cotta for the new buildings; and the work was entrusted to Mr. Blashfield and made at the Stamford pottery.

The execution of this work occupied three years, and in it Joseph Joiner performed the duties of quantity clerk and assistant draughtsman. This gave him an insight and experimental knowledge of every detail of the manufacture and design of this great work, and doubtless laid the foundation for the eminently thorough and practical knowledge which he has always evinced in his work in America.

When the Perth Amboy Terra Cotta Works of Alfred Hall was reorganized and controlled by the Perth Amboy Terra Cotta Company in 1879, the new management corresponded with and engaged Joseph Joiner to come to New York and assume the superintendence of their works. At that time they had undertaken to supply the terra cotta work for the New York Produce Exchange building, designed by George Post, architect. Mr. Joiner's previous experience and his association with English architects at once made him a valuable assistant to Mr. Post and his own employers in the execution of what was then a very important and to some extent an experimental work. The great success and the present condition of that large and excellent specimen of the terra cotta clayworker's art testifies far more eloquently than the pen can do that Mr. Joiner brought with him to the United States a thorough knowledge and skill which enabled him to become a great factor in the development of the art of architectural clayworking in America.

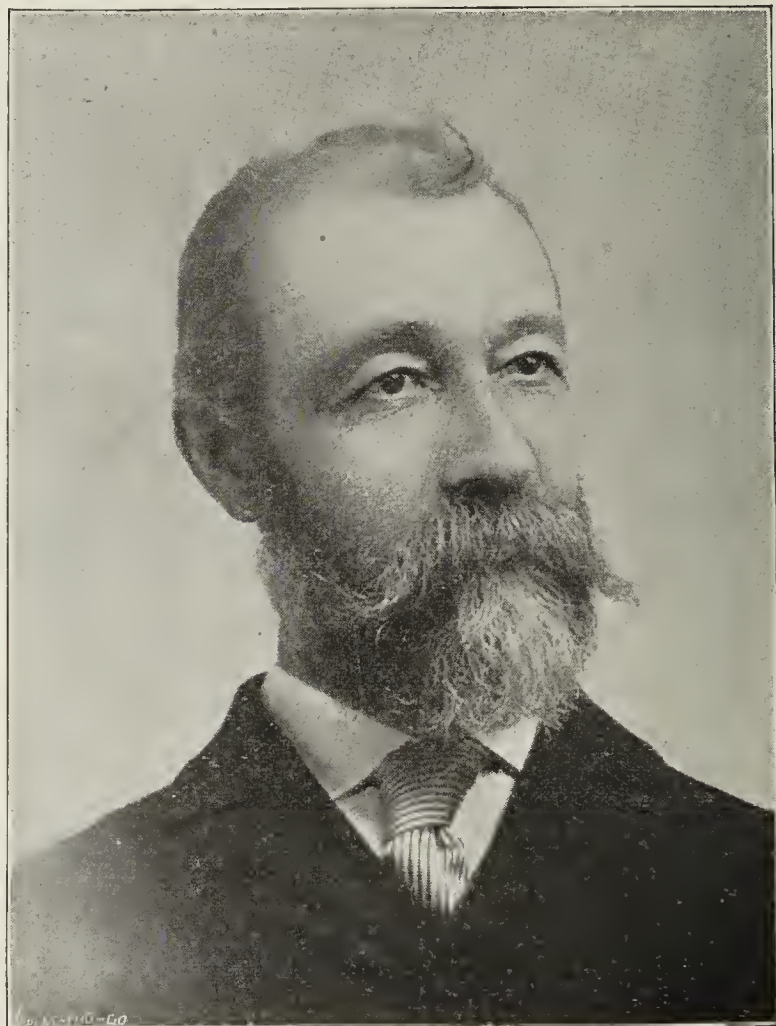
In 1884 Mr. Joiner came to Indianapolis and took charge of the terra cotta works at Brightwood. Here his knowledge

and experience led to the adoption of correct and practical methods, which have given the works and their product a recognized position among the great terra cotta works of the time.

Since he became a neighbor and co-worker among us we have ever found him an earnest worker, a kindly companion, a clean, square man, and a willing helper. Like our old friend Crary, Sr., who left us last year, Joseph Joiner believed it right to "do good, and communicate."

He has been taken away in his prime. His going was unexpected. We thought of his being with us for years to come, but he is not. Again the Voice speaks to us, and as we approach convention time it sounds the louder: "What thy hand findeth to do, do it with thy might. For the night cometh, and also the morning."

From 1864 to 1870 Joseph Joiner and I were constantly associated together as fellow-workers, and ever since there has been with me a pleasant recollection of his features and good-



The Late Joseph Joiner.

fellowship as I bid him good-bye on my starting for the United States in the year 1870, and it was a great pleasure to find him nine years after coming over here, to help build up the department of clayworking, in which we both, as young men, had labored together.

To his memory every clay-worker may offer a tribute of respect and look forward in hope of winning the reward of every faithful worker. "Well done." JAMES TAYLOR.

### BELIEVE IN YOURSELF FIRST.

If you would be successful, have faith in your own ability. Nothing is so essential to a leader in any kind of society or business as self-confidence. It is the leader in business who is the successful one. Of course, nothing can be accomplished without effort, but without confidence in one's ability to succeed there will be no effort. Business success has resolved itself into a matter of looking out for number one, and if number one has faith in his own works he makes for himself a position at the head of the procession and retains it by right of possession.—Ad. Sense.



Written for the CLAY-WORKER.

### CLAYWORKING IN GREECE.



N LOOKING BACK over the history of the world, it sometimes seems as if waves of skill in certain directions had swept over a country, there being a gradual rise in the quality of the objects produced, until the crest of the wave was over the land when the art—as pottery making and clayworking—had reached its highest stage of perfection, after which it began to decline. No country, perhaps, shows this more markedly than Greece.

After seeing the wonderful specimens of the workmanship of the ancient Greek in the museums of Europe, my hopes were that at least some of this talent and skill had descended to his ancestors, but I was doomed to disappointment.

Greece, in the early days, when Babylonian and Egyptian clayworkers flourished, had a style that was distinctly her own. Her potters were highly original, and preferred to devise their own styles of decoration and form. They had little use for bricks, for the marble supply proved far more attractive to them, and they made no mean use of it, as the ancient temples of the Acropolis show. Neither did they use clay for writing on as did their neighbors, the Babylonians. On the contrary, the ancient Greek clayworker shaped his plastic materials into all sorts of terra cotta figures and ornaments. Some of these were plain, others adorned with color, at times even a little gilt being used. He did not stop here, however, but rose still higher, until his productions were such as to place him among the foremost artists of his time, and some of the ancient Greek vases are truly wonderful, not only on account of their decoration, but also for reason of their graceful outline and at times large size. To be sure, such productions were brought about by a process of evolution. When excavations

In the lowest or oldest town were found crude bits of pottery made of coarse clay. Following upward in the excavations the articles showed an increasing regularity of form, then in smoothness, for the ancient Greek had learned to



Greek Church at end of Street, Stone Walls with Brick Trimmings and Tile Roof.



Adobe houses at Aegion, Greece, with Bake-oven in front.

wash his clay. This was succeeded by decorated wares, and then by pieces of complication in shape and in decoration. And, as for the present—well, the modern Greek has not quite gone back to the stage of his ancestor who worked when the lowest city of Troy was built. His chief occupation at the present day is to make little busts of Minerva and statuettes of Apollo and sell them to the unsuspecting tourist for ancient terra cottas. Aside from this he is engaged in making earthenware jugs for water and wine. These are made from local, red-burning clays, and formed by turning on an ordinary kick-wheel. The most important brickyards are near Athens. Between this city and Piraeus, its seaport, some four miles distant, is

a broad, flat plain, underlaid by an abundance of sandy clay. Scattered here and there between farms and vineyards, which cover this tract, are numerous small brickyards, all busily engaged in making soft-mud brick. The clay is tempered by mule power and the bricks molded by hand. They are then piled up after drying and burned in scove kilns. It matters little if the bricks be rough, for in Greece, as indeed in many other foreign countries, the building is never considered completed until the outer walls have been completely plastered over

As to roofing material, there is hardly a roof in Athens which is not covered with clay tile. Most of these, however, are imported from other countries, Marseilles contributing its share.

As I rode from Athens to Patras, along the gulf of Salamis and the bay of Corinth, there was much about the hills and deep, narrow valleys to remind me of Western scenery, but, curiously enough, and in keeping with it, were many villages whose adobe brick houses were almost identical with those of the Mexican and Pueblo Indian of the Southwestern United States. To heighten the similarity, there stood in front of each house the same kind of bee-hive shaped bake-oven, also of



View Across Roofs of Athens, Showing Roofing Tile.

were recently made in Troy, and the remains of seven communities found, one above the other, the different stages of this transition were found.



adobe make. That two peoples on nearly opposite sides of the world should build so alike is curious.

As I left Greece and journeyed towards Italy I began to hope that I should find clayworking there on the up grade, and not in full retreat, as in the land I was leaving, and this time I was not disappointed.

HEINRICH.

Written for the CLAY-WORKER.

#### WHAT KILN SHALL I BUILD. No. 2.



IN OUR LAST PAPER we stated that our studies of kilns had special reference to those used for the burning of face building material, where uniformity and purity of shade and color is of prime consideration, which results are, of course, based upon a uniform distribution of heat throughout a kiln and perfect combustion, or, what may fairly be called such, and with no stagnation of gases during the period of water-smoking. It is evident that such uniform distribution of heat is of equal importance in the burning of pavers and other vitrified wares.

It was further stated that our convictions were that these results could be best secured by the employment of the down-draft principle. We, in that paper, gave some facts and figures relative to such kilns, and adduced the testimony of undisputedly competent experts as endorsements of our conclusions.

We will now present the theory on which the system of burning by down-draft is based and compare it with the up-draft system.

The theory must be shown to be in harmony with natural laws. It has often been asserted that this is not so, but that the contrary is true. Let us see.

The advocate of the down-draft system asserts, first, that the wares being burned in such kilns are immersed in a

##### —Reservoir or Pool of Heat—

as against being located where currents of heat only are brought into contact with them. Second, that by holding the heat in such reservoir there is secured an evenness of heat distribution, which cannot be as certainly secured by any other system. Third, that by such retention of heat, in place of allowing it to pass out through flues or openings near the top of the kiln, a more economical use of fuel is attained, and, fourth, that with the same degree of watchfulness and skill on the part of the burner, uniformly better results may be had.

It will be evident that much will depend upon the details of construction in each case, and upon the intelligence shown in setting the kilns as well as in the firing. A good tool may and is often made to do very unsatisfactory work. Discussion and comparisons on these lines will be in order later.

While probably the great majority of the readers of this journal are well acquainted with the general principles involved in burning a kiln of clay wares, it is very evident to any one who will follow the discussions that take place concerning the subject at the gatherings of the craft, or who will read the articles appearing in the Clay-Worker from time to time, detailing experiences or asking for information, that there is a failure on the part of many to clearly apprehend the orderly procedure of this burning process. It is in the hope of rendering some service to such, that this process will be followed, and in a manner so simple as to be wearisome to experts, possibly.

The question is asked "Why a more even distribution of heat in a down draft kiln." In treating of heat, or in considering its application to a kiln of clay wares, many fail to take in the fact, that as it presents itself in the kiln

##### —It is Contained in a Gaseous Fluid Body—

which has both measure and weight, and that practically we are dealing with such a body.

The air passing through the furnaces, is, in the process of

combustion, converted into lighter gases, which passing up through the bags or flues carry the heat with them. They must have room to occupy, this they can only gain by displacing the cold air already in possession. How shall this cold air be disposed of? We make openings in our kiln floors, which connect with flues below, and which in turn are connected with our stack or chimneys, and we invite the cold air to take its departure by this route.

If our stack has not been previously heated by a connection with other kilns recently burned, we find this body of cold air indisposed to accommodate us. Dame Nature has given it the lowest place it can find, and it proposes to keep it and will not, in fact cannot, climb up the flue of our stack unaided.

The fires started in our furnaces are discharging smoke and heat largely outside the kiln. Very little of it is reaching the interior of it, and just here we find that to burn by down draft, is to fight natural law, and that we must introduce some other factor as a counterbalance or fail. If we have been wise we will have constructed a small furnace at the base of our stack, a light, quick fire is laid and lighted at this point. We should take in no external air for combustion at the outset, our furnace should be so constructed as not to obstruct the flue of the stack, and so as to use the cold air from flues and kiln in consuming its fuel. At once the draft of the chimney begins to assert itself—we convert the cold air in our flues and kiln into heated gases which seek an outlet up the stack, they can, and will, climb and they create a vacuum which draws after them the cold air that remains in flues and kiln to be in due order heated by passing through the combustion chamber of the furnace at the base of the stack. As the cold air is drawn from the kiln in this manner, its place is taken by the heated gases from the kiln furnaces, which furnaces, now relieved of the back pressure, which at first existed before the stack furnace was lighted, freely receive the air needed for combustion. It now needs only that until the stack becomes heated and the vapor from water smoking is disposed of the fire in the stack furnace be regulated to meet the needs—a few hours ought to suffice as a rule. One thing needs to be noticed in connection with operating the stack furnace. When the cold air has been exhausted from the kiln and only the gases of combustion are passing to the stack from the kiln the fire at the stack will grow dull, or die out entirely for want of oxygen, when this time arrives, if it needs that the fire be continued longer just enough air may be admitted through the draft register in the ash pit door in the stack furnace, to keep the fire in good condition—care being taken to admit no more, in order that the cold air in the kiln and flues may be lifted by the draft created in the stack by the furnace heat discharged into it.

Cross section views are given of the furnace as connected with the stack which need no explanation save to call attention to the fact that the cold air of the flues is drawn in at "a" through an opening in the stack wall and discharged under the furnace grates at a point in the ash pit above where it is liable to be clogged by ashes, and that the gases of combustion carry the heat of the furnace into the stack at a point higher up—at "b."

While we are not now treating of kiln firing, but of kiln construction it will be proper to state just here that during the early stage of firing it is well to allow only so much air to pass into the kiln as is necessary to secure combustion, and that this should pass through the fuel, and not over it, to the end that the kiln be not filled with sluggish air, robbing the draft of the efficiency it might otherwise possess. To return to our subject, we left the heated gases from our kiln furnaces seeking admittance to the kiln, but their entrance obstructed by the cold air already in possession. We found a way of removing this air through the help of the stack furnace. We may now go back and follow the gases as they enter the kiln. If we could get a look inside the kiln at this early stage, we would notice that the smoke accompanying the hot gases, had accu-



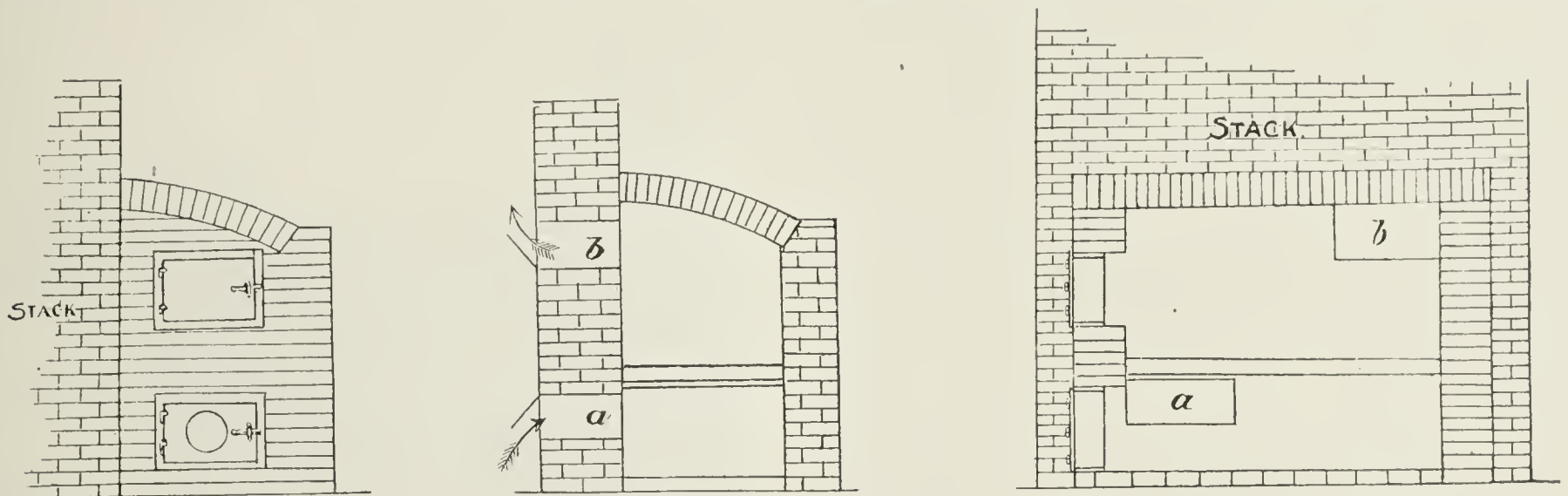
mulated in the crown of the kiln, and was gradually and evenly settling down from the top, totally submerging the clay wares piled within at the top. And we might follow the gradual settling on an horizontal line until all was submerged. Should we make use of a thermometer for measuring the heat in the kilns we would find corresponding conditions. After the kiln fires had been lighted a few hours we might find a heat, say of from 200 degrees to 300 degrees in the kiln crown above the green wares dropping quickly to a lower temperature as it should envelope these wares to be burned which present a large surface to absorb the heat contained in the gases; and we would find the temperature gradually diminishing until at the kiln floor we would find it but a very trifle higher than that of the atmosphere outside the kiln. This burning process need not be followed further now. We have established our draft connection with the stack, and the method of doing so has been defined.

The method referred to is but one method; there are others. Some strongly advocate employing the up-draft system during the early stages of water smoking. In order to do this, they make a passage way between the furnace and the flues below the floor of the kiln and discharge the gases and heat from combustion into these flues, from whence they find their way through the floor openings into the kiln, pass up through the wares and into the kiln crown and thence through vents in the crown to the outside. When the flues and the floor have become well heated, the passages between the flues and furnace are closed by dampers, the vents in the crown are closed and the heat is admitted into the kiln through the bags and finds its way without further aid to the stack, because the heat at the bottom and in the flues of the kiln will naturally find an outlet to the open air through the stack. The damper to which

well-known to the readers of the Clay-Worker through his contributions to it, and known also as an experienced kiln builder, contends for the up draft in "drying off and heating up" a kiln, while at the same time he is a sturdy advocate of the down draft principle in burning. His article alluded to is well worth a second reading.

Now what are the facts in the case? Mr. C. builds a square kiln usually of large dimensions we infer, and the whole arrangement of the kiln with its ample underground flue connections has reference to his particular method of handling heat. It would be obviously unwise to attempt to run this kiln on any other plan than that which he outlines in the article referred to. We shall have occasion to refer to special features of this kiln later. We have abundant evidence on the other hand that a multitude of intelligent and able workers are securing most satisfactory results using the down draft method from start to finish. Where difficulties are experienced of stagnation at the beginning of a heat, let it be understood that there are two remedies at hand either one of which intelligently applied should bring satisfactory results.

While, as we stated earlier, we have no strong bias, our judgment is in favor of beginning and ending with down draft. This preference may have grown out of a previous preference for a crown kiln, one of a group located to secure the benefit of a single stack for three or four kilns. We write the "benefit of a single stack" with purpose, for had we the choice of a stack with each kiln at the same cost at which one could be had in connection with three or four, we would choose the single stack, and that for two reasons: first, at least nine times out of ten our kiln fires would be started having the benefit of a highly heated stack, and in most weathers we should be quite independent of a stack furnace in starting to burn a



*Front Elevation and Cross Sections of Stack Furnace.*

was closed while the up draft principle was employed, and thus a satisfactory draft is by this means secured, dispensing with a furnace at the foot of the stack. The advocates of this system will tell you that by heating the kiln thoroughly in the bottom in the first stage, the condensation and lodging of moisture upon the lower tiers of the brick or other wares to be burned, which is liable to take place when the down draft principle only is employed, is wholly prevented, and that the wares near the crown of the kiln are not as likely to be overburned, in other words, that the tendency is to equalize the burn. While the champion for burning by down draft only will assure you that your fuel will be wasted by the gases being discharged into the open air before the heat has been utilized, that it is well to drive out the chemically combined moisture from the wares in the top of your kiln, before this stage is reached in burning the wares near the floor of the kiln, for the reason that before the period of softening comes—which always attends the expulsion of this moisture—the weight of the load carried by the lower tiers of wares has been greatly reduced by the subtraction of the moisture from those above, and hence the lower wares are more likely to retain their shape. This, as stated in our previous paper, was the admission of both Father Crary and R. B. Morrison, as one of the advantages of burning by down draft. At the last national convention held at Pittsburg, Anthony Ittner is on record as saying that he has secured as good results in the same kilns by water smoking either by up or down draft.

We have called attention to the two methods employed, and must confess to have reached no very strong bias in either direction. Which is the better depends very much upon the general construction of the kiln, its form, size, relation to other kilns, etc. Perhaps this may be made plain by citing a case or two. In the March number of this journal, J. K. Caldwell,

kiln. Yet we believe in such a furnace, even though not required for service one time in ten. Where oil is used as a fuel an oil burner at base of stack may take the place of a furnace, observing, however, the same principle of excluding as much outside air as possible. Our second reason for the choice of round or crown kilns would not be applicable in all cases, but will apply as a rule in the line of manufacturing face brick, ornamental wares—as building blocks, fire proofing, sewer pipe, etc., etc., the size of the kilns depending upon the ability to fill them either with one or two days' run of machinery output. The benefits resulting from such course are: first, the ability to make a quick turn to meet any special requirement of the market; second, a more uniform round of work for the hands employed at the dryer, kilns and in the yard; third, any disaster to a kiln being burned would be comparatively limited in its extent and fourth, better average results, a greater uniformity, may be attained.

Where large, square kilns are employed depending upon one large stack, the benefit of a hot stack from a previous burn cannot of course be as well secured, and in many cases the infrequency and lack of periodic starting of new fires precludes any benefit from this source whatever. In such cases the up draft method of drying off or commencing the water smoking, may be found the most effective.

Let us now give our attention to the construction of the walls of a kiln. It has sometimes seemed to us that less thought had been given to this part of the structure of a kiln than to any other.

There seems to have been by general consent—if we may judge from what we see—a willingness to settle down upon what has been done, and upon what has been found to work fairly well in the past. And yet it is undoubtedly true, and we all realize it at times, that much of the heat we create, and so



much of the fuel we burn, is wasted or lost to us through being absorbed by the wall and carried to its outer surface. If this is true of the wall proper, it is doubly true of the arch or crown of a kiln. It is well worth while to stop and inquire whether anything can be done in the line of reducing this waste.

Who is there of any large experience in the use of kilns who has not had brought to his notice again and again the great demand made upon a fuel pile during a period in which a strong cold wind has prevailed and the difficulty experienced at such times of keeping up the heat to the needed temperature on the windward side?

(Continued in next number.)

Written for the CLAY-WORKER.

PLASTIC BRICKMAKING IN ENGLAND.

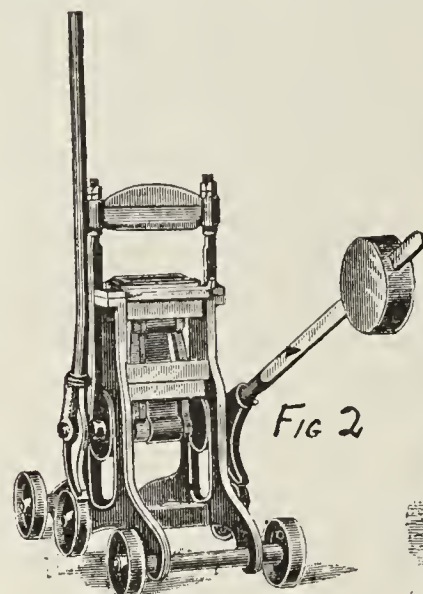


DO NOT, in writing this short article, intend to give any particulars of hand brickmaking, but purpose confining myself entirely to the various methods of machine brickmaking that are mostly adopted in England. Of course, it will be obvious to the reader that the clays are not in any way similar throughout the numerous plants in operation. Below I append the chemical composition of some of the principal of plastic brick clays in this country:

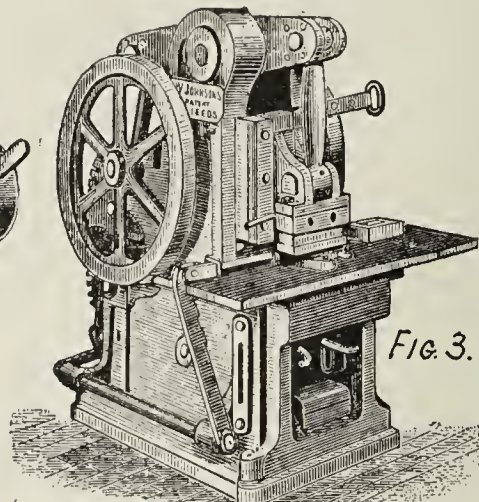
|                              | No. 1. | No. 2. | No. 3. |
|------------------------------|--------|--------|--------|
| Silica.....                  | 63.00  | 61.46  | 42.84  |
| Alumina.....                 | 20.10  | 24.84  | 17.61  |
| Sesquioxide Iron.....        | 4.80   | 1.30   | .....  |
| Protoxide of Iron.....       | 1.51   | 5.59   | .....  |
| Potash.....                  | 2.37   | .....  | .....  |
| Soda.....                    | 3.10   | .....  | .....  |
| Combined Water.....          | 3.54   | 3.84   | 3.94   |
| Moisture.....                | 1.54   | .....  | .....  |
| Magnesia.....                | .....  | 2.42   | .....  |
| Combined Sulphuric Acid..... | .....  | .23    | .....  |
| Alkalis.....                 | .....  | .32    | .....  |
| Lime.....                    | .....  | .....  | 15.36  |
| Carbonic Acid.....           | .....  | .....  | 11.61  |
| Oxide of Manganese.....      | .....  | .....  | 2.20   |
| Peroxide of Iron.....        | .....  | .....  | 6.97   |

No. 1 is an analysis of the clay found in the Ruabon district and makes a splendid red facing brick and is also largely used for the manufacture of terra cotta, having a large proportion of silica and sufficient coloring matter in the sesquioxide of

in brick and terra cotta ware. As will be seen from the analysis the material contains a large proportion of free silica and is difficult of fusion. The clay also has a liberal supply of



HAND LEVER PRESS.



STEAM LEVER BRICK & TILE PRESSING

the oxides of iron and burns a deep red in color. The bricks are in great demand throughout the country, and it has also been found they possess special qualities for resisting the disintegrating effects of sea air at our seaside resorts. Here the bricks are used in a wholesale manner for facing purposes, more especially in modern buildings, and have on numerous occasions refaced old buildings.

No. 3 is a red marl of the Midland counties. This abounds in large quantities, accompanied with loose thin layers of Skerry or impure limestone, and in many places veins of Gyp-

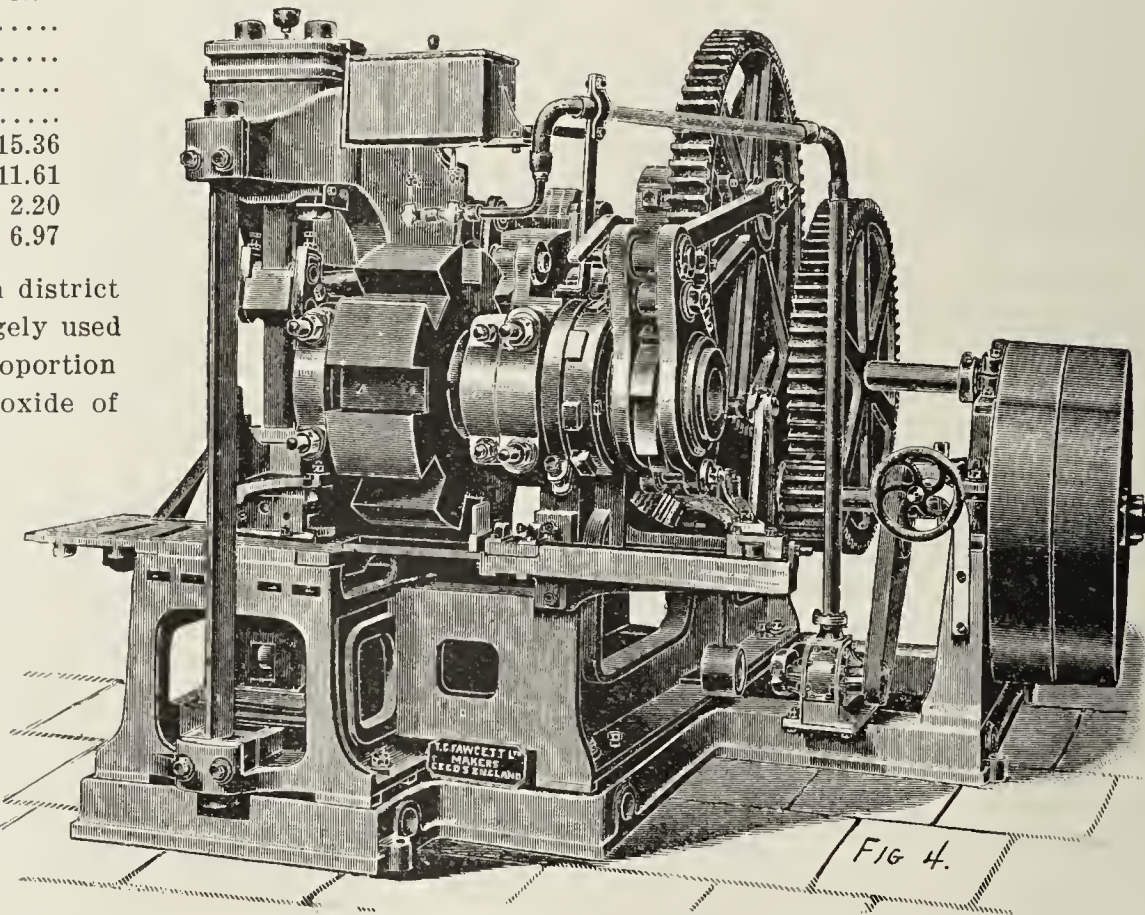
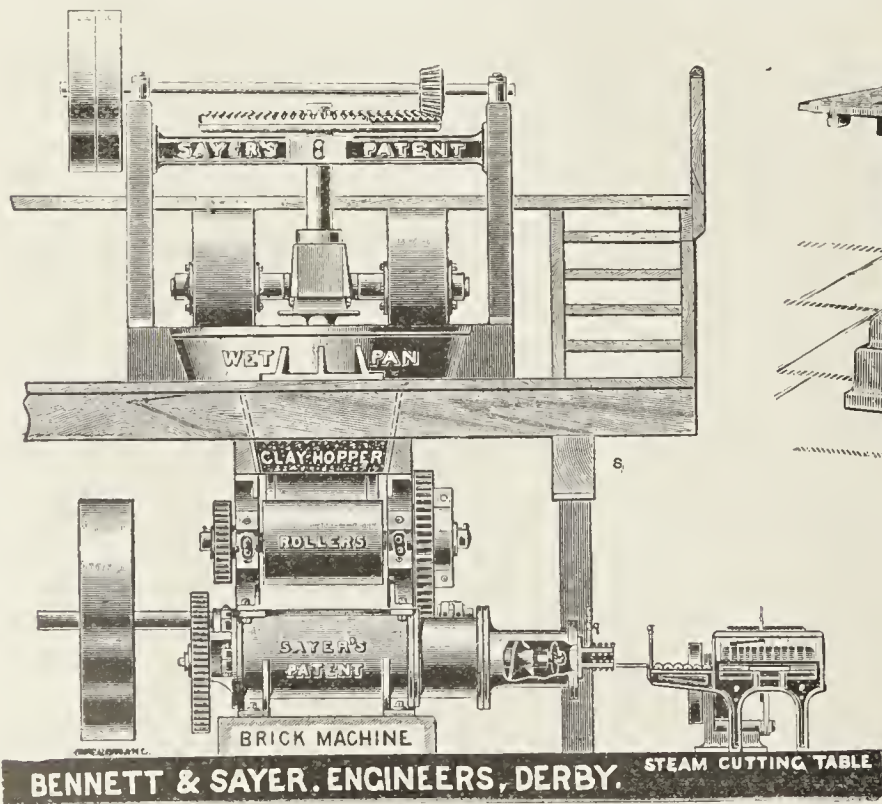


FIG 4.

sum make their appearance. In most brickworks this earth is all used just as it is dug from the face, in others all the large pieces of lime are picked out by hand, but at its best it is only available for a common building brick, and even then of a very irregular color, but passable in shape. A few of these have been repressed in an ordinary screw press when partly dried, then dipped in a simple coloring composition and burnt in the same chamber as the ordinary wire cuts, but results did not give much encouragement, and were finally abandoned.

The principal method of dealing with the foregoing clays is what is known as the ordinary Pug Wire Cut method, and in Fig. 1 an example of one of these plants is shown.

When the bricks are intended for facing purposes the wire



A PLASTIC BRICK PLANT Fig. 1.

iron. By many this is looked upon as the finest facing brick in England, being very regular in color and well vitrified.

No. 2 is the shale of the Accrington district and the product therefrom is a very close competitor of the Ruabon goods, both



cuts are always repressed when they are partly dry in hand or power presses of such types as Figs. 2 and 3.

The machines used for dealing with the shale No. 2 are mostly those of the types Figs. 4 and 5. They are often erected in combination with perforated grinding mills for the purpose of turning the hard material into a "dust" form so that the clay may be much more satisfactorily tempered when received in the mixing pug portions of the machines.

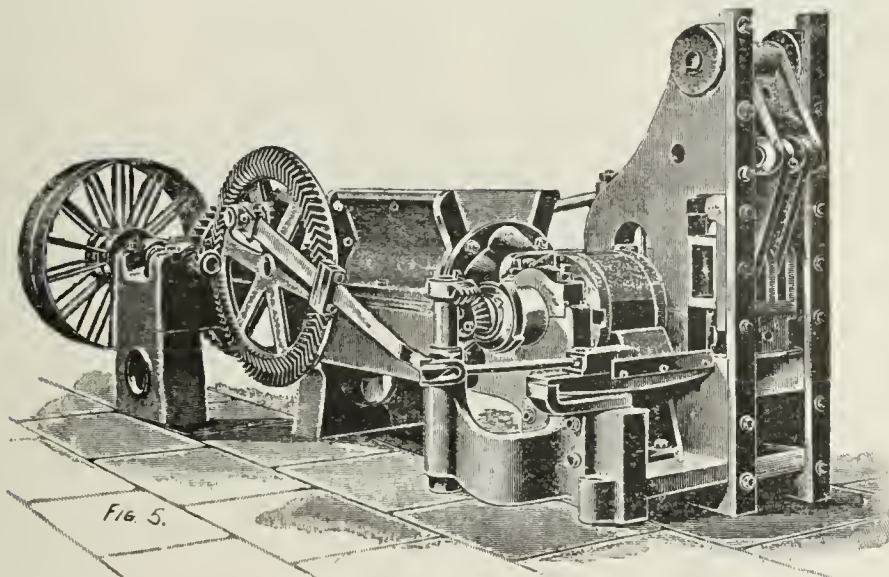
This class of machines pug the clay and repress the brick before it is delivered, after which it may be taken straight to the kiln and set for burning.

The method of getting the clay does not vary greatly in the different yards, whether it is only a few feet in depth or a great many yards. The men start on the top with pick and shovel and work straight down, throwing the material into the bottom for others to fill into trucks.

The system of undercutting the face and propping the hole till it was sufficiently undermined, then striking the props and letting down a great quantity at once is almost abandoned, for there have recently been several fatal accidents through this in various parts of the country. Since the new Workman's Compensation Act has come in force more discretion is now used than was formerly the case, and in many works undercutting has been entirely abandoned on account of the danger.

The clay is hauled to the machine house in various ways, some pugmills are built with a winding gear attached, actuated by a clutch under the control of the attendant who receives the clay from the pit. When these means are employed it is usual to haul several wagons up at once and on arrival in the machine house they are dumped on to the floor and the empty wagons returned to the clay pit.

Some little time ago I visited a yard employing this method



of hauling. They, however, only pull up one wagon at a time, which is dumped straight on top of the rollers of the machine. With this quantity being suddenly thrown in it was liable to slacken the speed of the engine, and to avoid this a throttle valve was placed between the boiler and engine. From this a lever was carried to the platform, where the clay was fed into the machine, and when a wagon had been dumped the man in charge opened the valve to its full extent, this kept the engine up to its usual speed, and as the clay passed through the rollers he regulated the steam supply to suit. When all the clay had passed through he closed the valve, but provision was made for sufficient steam to pass along the steam pipe to carry on the work required till the next wagon arrived, when the process was repeated.

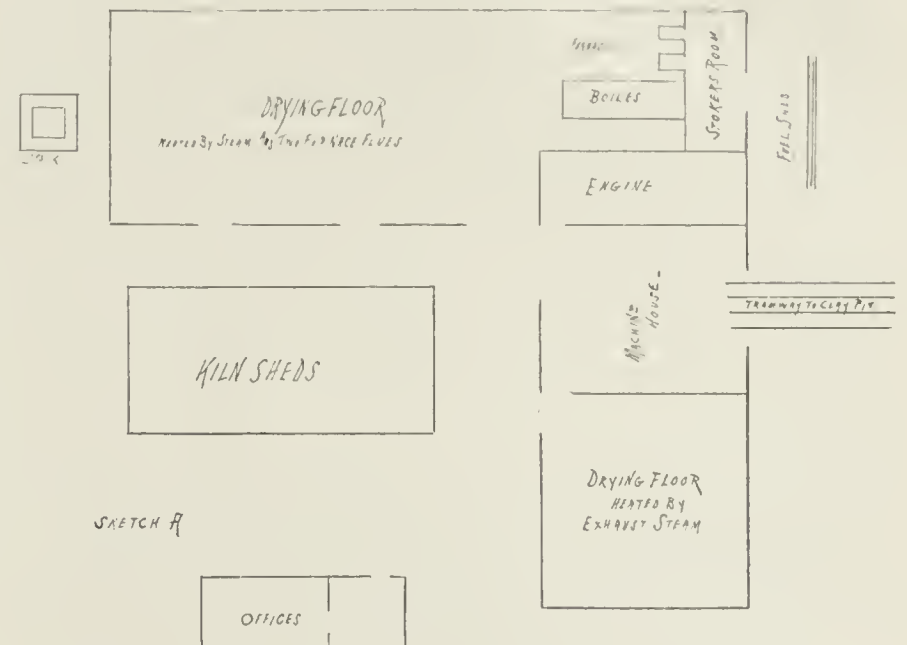
This is not by any means a modern arrangement, but I merely describe this case to show one of the crude methods in operation. Another and much better system of haulage is an endless chain tramway, shown in Fig. 6.

These wagons carry a smaller quantity of clay, but there are more of them, and, of course, the supply is more regular. It will also be seen from the illustration a number of different tramways may be driven by the special capstan frames that are fixed at the clay pit end. These can be set to suit the workings of different faces of material. It may be noted that the lines of tramway (shown to the right and left) are worked by as independent chain on two capstans underneath the floor plates.

I will proceed to describe the wire cut plant possessed by Messrs. Dusantoy & Co., and situated at Derby, of which the sketch A. is a rough plan, showing the arrangement of the works.

The machinery employed is of the type illustrated in Fig. 1,

and is turning out a remarkably good common brick from a hard red marl of the class represented by analysis No. 3. This face of marl, which is 50 or 60 feet deep, has been worked for a great number of years, but the plant was rebuilt and modern-

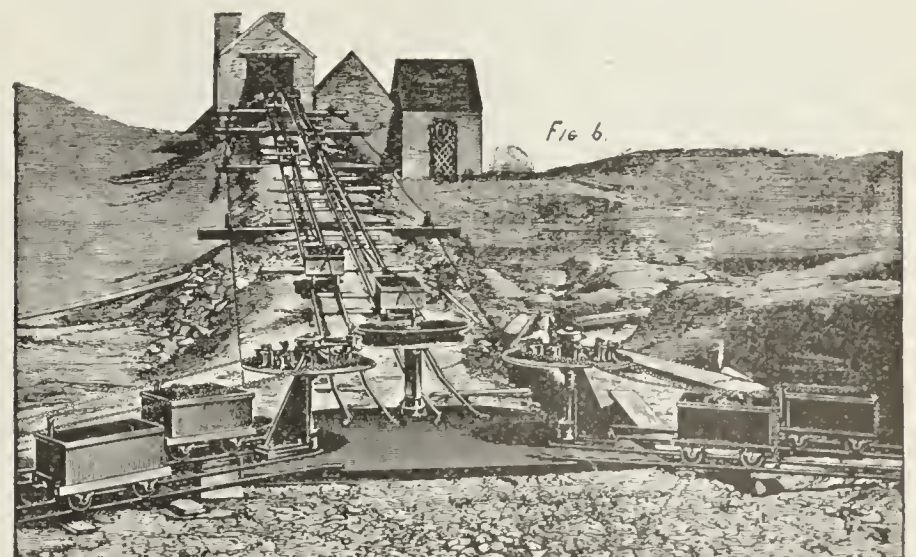


ised three years ago, to the design of Bennet & Sayer, of Derby, and has an average output of 100,000 per week of 53 hours.

The machinery, kilns, etc., were erected on more suitable ground further away from the clay pit. Since the removal the ground on which the plant formerly stood has been worked up, even the brick of the old kilns have been thrown in and mixed and ground up with the fresh clay.

The marl is cut from the face in the usual way by starting at the top and working straight down, only the sod being thrown away. As the clay is thrown into the bottom the large pieces of lime are picked out from amongst it. It is then filled into the wagons of a tramway, Fig. 6, and hauled up the incline to the machine house. On arrival here the wagon is run into the tipping frame, Fig. 7, which dumps the contents into an iron trough containing a revolving screw of the ordinary conveyor type, and this in turn feeds the wet pan or edge runners. The advantage of this automatic feeder is that it does the work more regularly than could be done by hand and leaves the attendant free to attend to the water supply, and therefore a better chance of keeping the clay more evenly tempered.

The edge runner itself consists of a fixed pan bottom, 9 feet diameter, having an upright shaft driven by overhead gears and carrying round with it two heavy iron rollers. Between each roller is fixed a scraper that draws the material into the track of the runners. Opposite the feed box in the pan bottom is a grid with openings of any required width through which the clay drops when sufficiently ground. It then passes between two pairs of horizontal rollers, 24 inches diameter and 36 inches long, and then into the pug itself. It is here carried forward and forced through a lubricated metal die by the



CLAY PIT TRAMWAYS.

usual knives and worms. On emerging from the die the column of clay is allowed to run the requisite length and cut off with a single wire by the attendant, who then pushes it forward over the rollers and on to a zinc-covered table. This is a side delivery power-cutting table, very simple in action, but giving excellent results. As soon as the column is in position the at-



tendant starts the power pusher, which pushes the clay nearly through the stationary wires on to a cast-iron shelf in front, the pusher then returns into position for starting again, and automatically stops itself. Another lot of clay is brought forward, the pusher started. The first lot of bricks are now pushed forward on to a receiving board, while the second lot is left in the position they were in prior to the second batch being pushed forward. The object of not cutting the column through at once is this: In working it in this manner a continuous cut is formed which stops the bricks from getting splashed or having the corners broken off while passing through the wires. As the bricks are pushed on to the board they are placed on a hand barrow by the pugman carrying one end of the board and the wheeler the other; thus it is only necessary to have one man stationed at the pug mouth. When the barrow is full the wheeler takes it away to the drying floors and sets the bricks on the floor. Meanwhile a second wheeler has arrived at the pug, and so the work is continued.

There are two drying floors in use, one of which is heated by the exhaust steam from the engine, it being conducted in longitudinal flues from one end to the other, these flues are covered with rolled steel plates.

The flues of the other and larger floor are connected to the flue from the steam boiler, utilizing what would be waste heat from the boiler fires. This is also assisted by two small fires working direct under the floor, all terminating into one chimney, which does duty for the kiln as well.

It is the practice in the summer time to pile the bricks nine high, as they come from the pug, but in winter they are placed singly on the floor.

When they are dry they are wheeled on barrows into a continuous kiln of the Hoffman principle, but built with square ends, the number of chambers being sixteen.

No great care is required in the setting, because, as before stated, they are only common brick. These sell for twenty-four (\$5.75) to twenty-six shilling (\$6.25) per 1,000; labor costs nine shilling (\$2.15) per 1,000. They are made, dried and burnt with eight cwt. of peanut slack coal costing about five shilling (\$1.20) per ton, but, of course, the prices of this vary at different works.

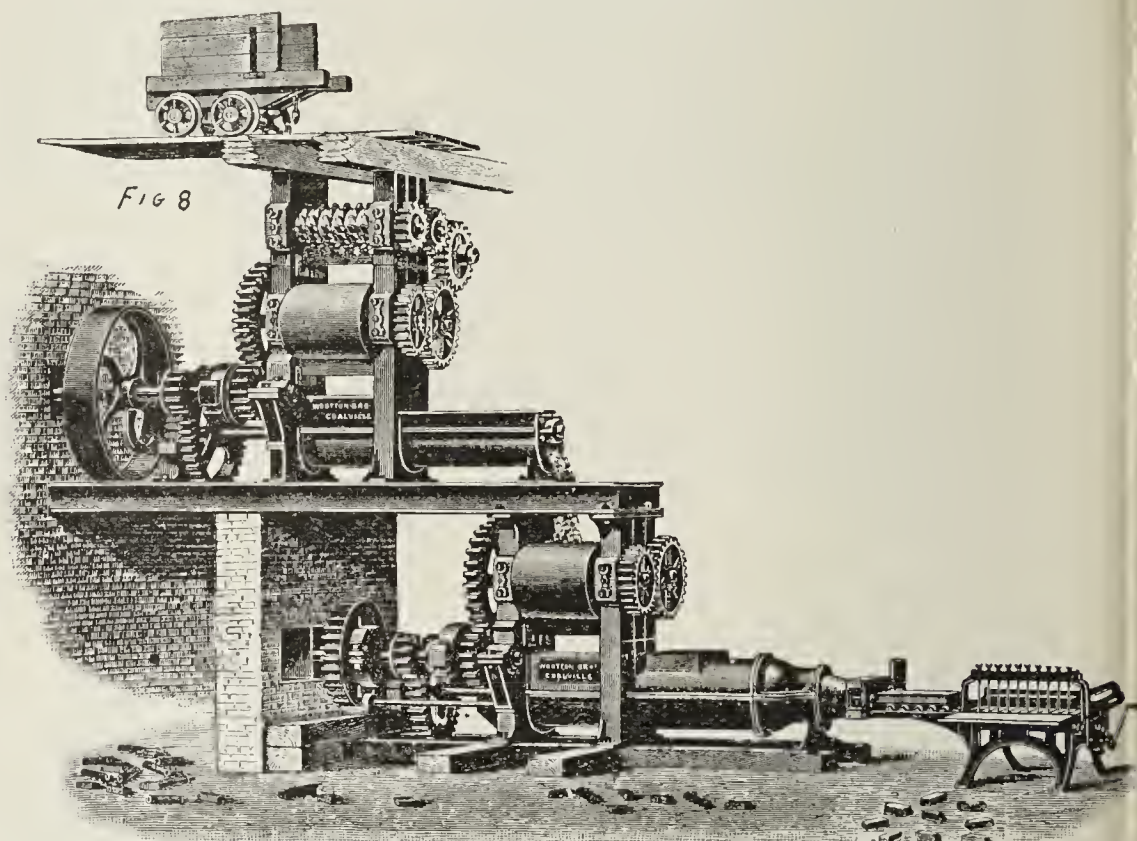
The motive power consists of a Lancashire boiler, about seven feet by twenty feet, having two fires and a non-condensing engine coupled direct to the main shafting.

The difference between the method described and the one in use in the Ruabon district does not vary considerably, but a plant largely used is similar in design to the one shown in Fig. 8, in which it will be noticed that the wet pan is not used, but in its place the toothed or Hedgehog rollers, also the introduction of a mixing trough. Of course greater care has to be taken to free the clay from stones as it is only best facing brick they aim to produce in this district which is noted, as I mentioned before, for its quality and appearance.

When partly dry these bricks are repressed in different

driven by overhead bevel gears, the material is dumped onto cast-iron plates forming the floor round the pan and fed into it by hand.

On passing through the perforations, mostly circular, it drops into the elevator buckets and is carried up to a revolving screen fixed over a cradle of steam pipes to keep it from clogging, the coarser particles pass down a shoot back to the mill. The other having passed through the screen is conducted to the brick machine and is received into the mixer or pugging portion and tempered to the requisite consistency when it is formed into a suitable shape by forcing through the die. A quantity sufficient to form a brick is cut off and carried round by the revolving block, this is now pushed forward into a special mould and repressed by an overhead toggle motion. The finished brick is then lifted from the mould by the machine and pushed forward onto the table from which it is taken by



the attendant direct to the kilns on suitable barrows. The kilns in general use for burning facing brick are of the Staffordshire down-draft type, both round and rectangular in shape, their capacity varying greatly. The round ones are hooped with iron bands two and one-half inches by three-eighths of an inch. These bands are coupled together with a bolt having a long threadpart so that the band can be slackened if the kiln on being fired the first time appears to be stretching the band to a dangerous degree by its expansion. Those built of a rectangular shape are held together by H steel girders being brought from below the ground floor above the top of the kiln and bolted together across it.

Several patent continuous kilns are also in operation and seem to give every satisfaction, but they are all principally modifications of the Hoffman.

Wages in this district range from 5d. to 8d. per hour and are slightly less in the Ruabon district, the week consisting of fifty-six hours in both cases. The price of facing brick ranges from 40 (\$9.50) to 50 shilling (\$12.00) per 1,000.

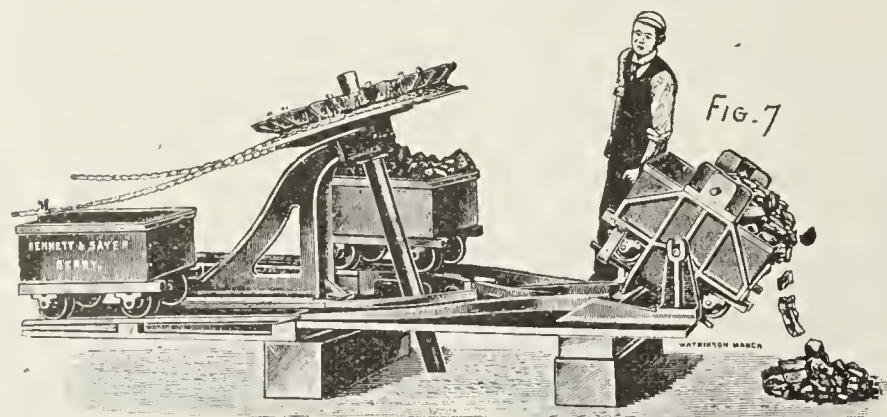
#### BE NEIGHORLY IN BUSINESS.

Criticising another man's business methods will do the critic just about as much good as it would to slander the wife of his next door neighbor—because she'll get even with him some way.

Neither Jones, Smith nor Brown can do business just exactly according to your ideas, but then the chances are that honors are even, for it isn't likely that your methods all meet with the approval of the aforementioned gentlemen.

So why say anything about it? It is better to be friendly. If you can't say anything good of a man, try to forget that he exists.—Ad. Sense.

So live your to-days that the memories of your yesterdays will be as pleasant as the hopes of your to-morrows.—Good Roads.



TIPPING FRAME AND SWITCH BACK, &c.

makes of presses, each having more or less some special advantage to commend itself to the user, again when finally set to dry special care must be taken to avoid cracking and warping. Setting for burning is brought out to its highest point to avoid unsightly marks on the face of the brick. When burnt they are carefully sorted into different grades, paying regard to cracks, color, broken corners, etc., they are then carefully packed in straw ready for transit by rail.

The system in vogue in the Accrington district is different from the others, because of the material they use (shale), this requires rather more getting than the softer clays. It is not customary to weather, even the hardest of this material, but it is hauled straight away to the perforated grinding mill, the system of hauling employed is the endless chain tramway. The mill in general use is from eight to eleven feet in diameter,



**PROGRAM ILLINOIS CLAYWORKERS' ASSOCIATION,  
PEORIA, ILL., Jan., 17 and 18, 1899.**

Tuesday forenoon will be devoted to enrolling members, and reports, appointing committees, etc.

—Afternoon Session.—

Address of welcome by Hon. George Warner, mayor of Peoria.

Annual address by President H. F. Townsend, Avon.

"How to Tide Over Dull Times and Keep Your Men," Mr. Elder, Bloomington.

Discussion.

"Drain Tile for High or Rolling Land," H. C. Patton, Flanagan.

Discussion.

"Clayworking a Century Since and Now," H. M. Baldrige, Illiopolis.

Discussion.

"Soft-Mud Brick," — — —, Peoria.

Discussion.

General discussion on "Clay Washing," led by F. Lehman, Chicago.

Adjournment.

Annual banquet given by Peoria clayworkers.

The forenoon of Wednesday, January 18, will be given to visiting the various places of interest, including the largest pottery in the West, convention being in charge of the committee of arrangements.

—Afternoon Session.—

"The Future of Clay Products," G. A. Tompkins, Avon.

Discussion.

"The Dryer," D. V. Purington, Chicago.

Discussion.

"Making Paving Brick—Not Cheap, but Good," F. Plumb, Streator.

Discussion.

"The Pottery," Geo. L. Wolfe, Peoria.

"Tiling Swamp Land," L. C. Streeter, Grant Park.

A poem, D. O. Loy, Atkinson.

Question box.

Report of treasurer.

Report of committee on resolutions.

Election of officers.

Headquarters will be at the National Hotel.

H. F. TOWNSEND, President.

G. C. STOLL, Wheaton, Ill., Secretary.

**TURNING LARGE POTS BY MACHINERY.**

—A Remarkable Power Jolly.—

**W**HAT POTTERS have for ages considered an impossibility has at last been accomplished, and pots or jars of almost any desired size can now be turned out by machinery.

The device, which is the invention of Mr. C. D. Weeks, an Akron potter, is remarkably simple, but embodies a new and novel mechanical movement.

The accompanying illustration gives only a partial idea of the construction and operation of a machine that will undoubtedly revolutionize the potter's trade, for it does the work of turning or pressing jars much faster and better than it is possible to do it by hand.

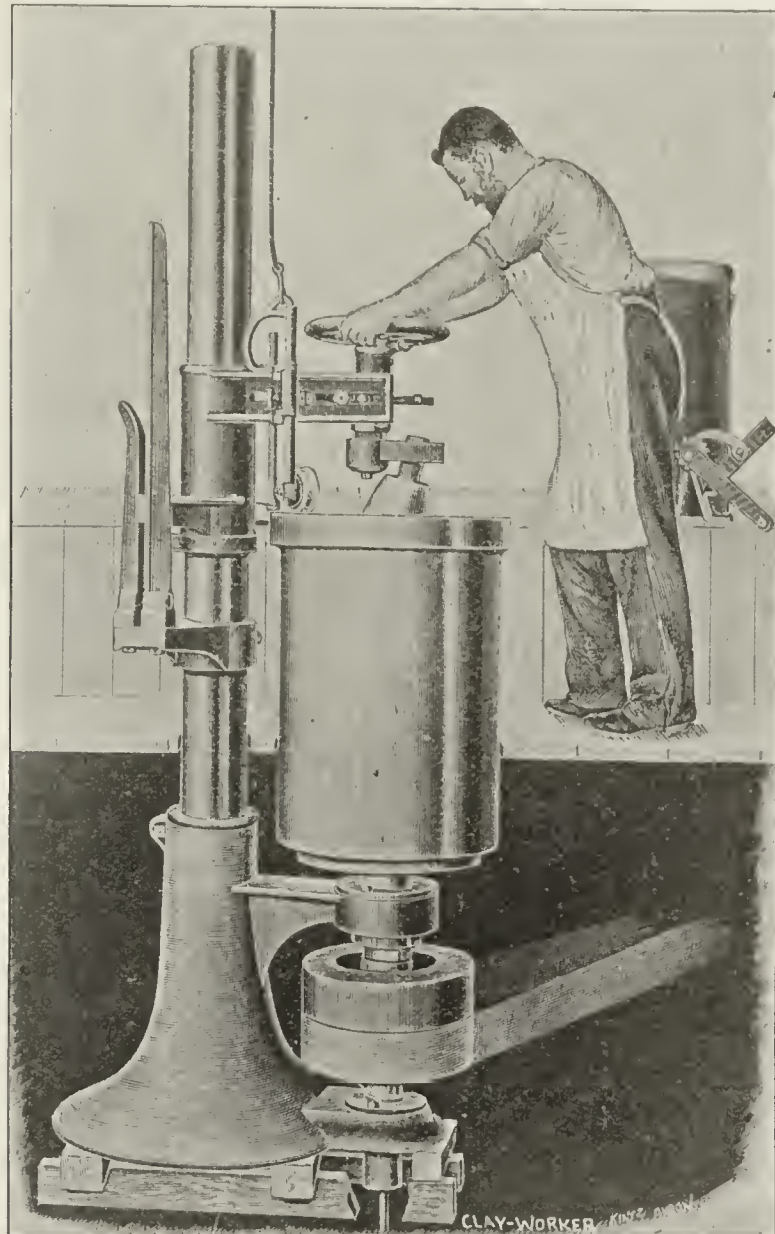
Turning large jars in the old way is exceedingly difficult, but with this new machine it is just as easy to make a sixty, eighty or hundred-gallon jar as one a tenth that size—much easier, in fact, than it is to make a five or a ten-gallon jar by hand, and the machine-made ware is really better in every way.

—Making Sixty-Gallon Jars.—

The machine has been in use at the pottery of F. H. Weeks, at Akron, for several months, and has proven equal to every need. The operation of the machine is simplicity itself. The clay is "wedged" or kneaded in the usual way, and a charge of the proper size and weight placed on a round wood pallet and placed on a swinging crane within easy reach of the machine

operator. The bottom of the jolly is brought to the top of the die, or metal jacket, in which the pot is molded, by simply turning a crank, and the pallet and clay is swung round and deposited upon it. The bottom plate is lowered into place, the crane swung back, and, by a movement of the foot, the belt beneath is shifted and the die or mold revolved at a high speed. The operator then brings the plunger into play. It is a long, round piece of polished metal, tapering from the center to the ends. It is suspended on a movable arm, and is lowered into the die and adjusted to the proper angle by the turning of a wheel.

Quicker than it takes to tell it the clay is pressed into shape. The plunger slowly rises, and as it clears the top of the die is swung to one side, the belt shifted to the loose pulley, and, as the revolving motion ceases, the bottom plate bearing the



A New Power Jolly, Manufactured by Taplin, Rice & Co., Akron, Ohio.

jar is raised. A truck is then run beneath the pallet, and the jar wheeled away to the dry room, easily and safely.

To prevent the clay sticking to the side of the die a piece of ordinary oil cloth, such as is used for floor covering, is placed inside the die, first being well greased. When the jar is lifted from the die this oil cloth is removed, leaving the surface of the jar perfectly smooth.

This latter feature of the work suggests a new field for experiment. By using embossed oil cloth, ornamental surfaces can be obtained with virtually no extra cost or labor.

This machine is indeed a remarkable invention. It is manufactured by Taplin, Rice & Co., Akron, who have made a specialty of pottery machinery for many years, and who will gladly give any further information that our readers may desire relative to this or any other of their clayworking machinery. See ad. on page 412.





### AN ELECTRIC-LIGHTED BRICK PLANT.



FOR SOME TIME past I have heard of a small but trim yard that even provoked a sense of curiosity and well-intentioned interest among our brickmakers. Naturally I became inoculated with the selfsame spirit. It was business interest and the Clay-Worker's service.

A rather long but charming trolley ride carried me to East Washington Lane. Alighting there I paced along in the shade and the sunshine, where the houses reposed in all the glory of bucolic city comforts, surrounded by old shade trees, velvety lawns that covered two acres and up to five for every residence. Beautiful scenery that continued until I turned into the gates of

—A. C. Collom's Brickyard.—

The railroad track of the Reading railroad was the only thing that created a sort of divisional line between the aris-



Glimpse of Mr. Collom's office, Works in Background.

tocratic Germantowner and this smart little plant. One did not need to tramp through eight inches of mud or dust to reach the office—no indeed! Here was a broad cinder track, terminating at the office, a creation of galvanized iron about 16x32, divided into three compartments, the interior finish in Georgia yellow pine and trimmed up with a hard oil finish. My self-made introduction brought forth a hearty hand-grasp and welcome from a good-looking fellow, who must needs wait some time to see forty, and soon after, under his guidance, we were making a tour of the yard.

In the layout, where he has five acres, everything is bunched well together. The hacking sheds faced the line of five eleven-arch kilns, with a capacity of 200,000 each, and for hauling purposes his double teams are the finest around here. Facing around, one enters the drying sheds and tunnels, and where last year the brick were all dried by natural means, modern

forethought and active progression has turned the waste steam to good account, utilizing it in the tunnels and drying sheds. From the Martin machine, working to forty thousand daily, the brick are carried up in the elevators, and here alone is a signal demonstration of the economy of time, since it takes but 28 to 29 minutes to put up a whole day's work, and the stock is thus put out one day and pressed the next.

Turning from the drying shed we enter the engine room, and here the condition was one of absolute freshness. Open beams, tongued and grooved boards of walls and ceiling had their coats of hard oil finish. Here I found a 100 horse-power engine of Philadelphia make and a 160 horse-power boiler. At the other end of the drying shed Mr. Collom has erected an extra engine room, and in this the 40 horse-power Erie engine runs the fan and dynamo, this latter supplying the entire plant with 160 16-candle-power lights, making a direct saving of \$100 a year on insurance.

All this improvement and lighting is due to the lesson learned by Mr. McCollom in the fire which threatened his almost total annihilation in January, 1897. Starting in a small way in 1889, within a half mile of his present location, he continued working and improving until 1895, when he was forced to move, with a result that is gratifying, since he has been able to turn out over 8,000,000 brick since last March—press, re-



Collum's Machine Gang.

press, stretcher and hards—finding both a fairly good price and market for same, in a locality where he is but little bothered by competitors.

### THE JARDEN BRICK COMPANY.

AMONG ARCHITECTS and builders there exist the eye trained, as throughout all important industries, to immediately recognize a specific class or style of work. Men having experience in specifying and handling a certain brick can, with marvellous accuracy, stand on the opposite side of a street, and with a cursory glance say, that's so and so's brick. And they will be right nine times out of ten. There's no guess work in it.

In Philadelphia to-day there stands many huge erections, based on the skilled design of the architect, and perfected by the clean-cut facial expression given by the molded brick, ground down to the finest and truest edge and in figures cut down the 64th part of an inch.

One's peregrinations through the city are halted by the skilled work displayed on the facades of the Bourse, Horticultural Hall, the Lorraine Apartment House, and the Land and Title Trust Co.'s building, lately erected at Broad and Chestnut streets. These face brick, mottles buff, fancy molded and otherwise, are of the Jarden Brick Co.

The plant started many years ago in a small way by the late



Jacob Jarden, whose golden wedding anniversary was celebrated in 1887, and in the festivities I found myself among the congratulatory guests. Yielding to the persuasions of his sons, Louis and Frank, Jacob Jarden set about in the '90 to transfer his interests, and in '92 it was merged into the above company. Under the new regime the dry press system was introduced and every possible form of improvement was put into effect. The location admitted of everything possible. The shipping facilities may be termed the finest in the world, since the Baltimore & Ohio railroad runs through their yard on the west side and the Pennsylvania railroad on the east, while the Delaware river within one mile changes its tide north and south every twelve hours to meet their convenience.

Covering about 25 acres the plant which is situated at 25th and Passyunk ave. and 26th and Point Breeze ave., looms up in that part of the "Neck" that has always been synonymous with "New Years mummies and all the year brick." In the general layout, from the rising ground may be seen the 22 hacking sheds averaging 300 feet in the length with the width of 30 feet, six tempering mills, 50x152 feet, twelve down-draft Dutch kilns of 200,000 capacity each, and eight up-draft kilns of 170,000 each. Six Gregg dryers, 140x115 feet and four Wolf & Colman dryers. While situated near the center and aided by the switch stands the huge clay sheds, 125x162 feet in length, and in the intersecting spaces are six sheds covering the store of manufactured stock. Power is obtained from three engines of the Corliss and Westinghouse high-pressure make of 75 and 100 H. P., and seven boilers of an equal power, the machine house having a front of 40 feet and a depth of 115 feet. The press room is a model of hygienic skill, well lighted, clean and roomy, containing six mold Boyd machines, two Martins, one two-mold machine and twelve screw presses. Thus, with a daily capacity of 150,000 it stands ready to accept the largest contract ever put on paper, since between thirty and forty million, molded, face and arch of every color and design have been turned out to meet the exacting designs laid down by the progressive architects of this and other cities.

The schools and power houses of New York City bear evidence of their aggressive spirit and worth of their brick, since to them that city, like Philadelphia, was an open field wherein many a hard-fought contract was secured on the merit of the stock offered. One of the largest face jobs in the State may be identified in the edifices of the Catholic Protectory, lately completed at Fatland, Pa. Seven hundred and fifty thousand extra and special face brick were delivered by the above company right on time, and to the entire satisfaction of the architects. Wilson Bros., of this city.

The sixteen-story office building of the United Gas Improvement Company, now in the course of erection at the northwest corner of Broad and Arch streets, calls for 400,000 fancy buff, 1½x9 13-16, and the Jarden Brick Co. having secured the contract are now working upon them.

The pay roll carries 500 names, and every man entering that yard comes under the scrutiny of Mr. E. A. Snow, the genial superintendent, who possesses the physique of Col. Bob Ingersoll, and the charm and manners attributed to Senator Smith, of New Jersey. From the yard to the main office, situated at 423 Walnut street, orders are given and received by 'phone, and in attendance every day may be found Dr. Wm. H. Clothier, the president, and H. Vernon, in all the arduous duties of secretary and treasurer.

MITSCHKA.

#### FIRE-PROOFING.

In a recent article in the Brickbuilder Mr. Adler makes statements in regard to fire-proofing which, coming from this careful architect, one associated with so many notable enterprises, must command respect. Mr. Adler does not take into account, and has little use for the cement fireproofing and much that is cheap and inferior, sailing under the name of fire-proofing. Clay products are advocated by him and the means of using are

clearly specified and discussed. It is discreditable to the common sense of many of our people that they should so easily be led from that which has been tested and proved by time and circumstance to that which is new, untried and illogical. Cement fire-proofing, as it is largely used, is not so used because



THE JARDEN BRICK CO—A Glimpse of the Works, The Stock Sheds and Sorters. Getting in the Clay. Office Window with Works in Back Ground.

it is fire-proofing, but because it is cheap. The insurance companies in the city of New York are writing ridiculously low rates on first-class structures, but they are not the flimsy, corrugated iron, cement and plaster devices which in the end must do so much to discredit the name of fire-proofing.



# A MODIFICATION OF BISCHOF'S METHOD OF DETERMINING THE FUSIBILITY OF CLAYS, AS APPLIED TO NON-REFRACTORY CLAYS, AND THE RESISTANCE OF FIRE-CLAYS TO FLUXES.\*\*

BY H. O. HOFMAN, INSTITUTE OF TECHNOLOGY, BOSTON, MASS.

IN DETERMINING experimentally the fusibility of clays, two kinds of methods may be distinguished—the direct and the indirect. Of the direct methods that of Seger has found much favor. It consists in placing in a crucible the clay to be tested with Seger cones\* (graded mixtures, the melting points of which are known), and heating in a suitable furnace until a cone is found which shows the same behavior in the fire as the clay. Different apparatus is used for refractory and non-refractory clays, the standard for a refractory or fire-clay being that it shall not melt before Seger cone No. 26, or at an approximate temperature of 1650 degrees C. The details of Seger's method of comparing fire-clays with his standard refractory cones Nos. 26-36 have been given in a previous paper.† For determining the fusibility of non-refractory clays, a special form of gas-furnace‡ is required, in which, with a good pressure of gas, Seger cone No. 25, the highest of the non-refractory mixtures, can be melted down in from 4½ to 5 hours. It may be said, however, that the melting down of cones Nos. 20-25 is often difficult.

Of the indirect methods, that of Bischoff§ has been extensively used. It consists in toning-up weighed samples of the clay to be tested with increasing quantities of an intimate mixture of equal parts of chemically pure silica and alumina, and forming them into small prisms, to be heated with a prism of Saarau fire-clay (equal to Seger cone No. 36) to above the melting-point of wrought-iron. The sample which shows the same behavior in the fire as the Saarau prism is the critical mixture, and the amount of toning-up substance needed forms the criterion of the fusibility of the clay.

Beyond question, the direct method is the simpler, since the clay need only be ground, molded, dried and heated with standards which are always uniform and can be bought in the market at a low price. The first test is made with Seger cone No. 26, to see if the clay is refractory or not, and the work is then continued with the Deville or the Seger gas-furnace. There is no drying and igniting, no weighing-out of clay and of fluxes, and no intimate mixing—all of which are tedious operations. If many tests have to be made, the direct method will always be followed. The indirect method, however, has the advantage that only one standard and one furnace are required. Considering the difficulties often encountered in melting down in the gas-furnace clays that are near the refractory line, and the advantage in this respect of using only one furnace (the one for refractory clays, which is cheap, and which anyone can build for himself), and simply determining how much refractory material is necessary to bring a non-refractory clay up to the required standard—we must confess that there are conditions under which the indirect method can hold its own.

The work to be described in this paper formed part of a thesis of Messrs. J. L. Newell and G. A. Rockwell, of the Class of '95, who with much care carried out the large number of tests required to verify the method.

In these experiments the Bischoff standard (Saarau clay, corresponding to Seger cone No. 36) was changed to Seger cone No. 26, which, as previously observed, forms the line of separation between refractory and non-refractory clays, the non-refractory clays being toned up until they showed the same

behavior in the fire as Seger cone No. 26. This was done because it was of more interest to find out how far the non-refractory clay stood below the point of being a fire-clay than how much refractory material would have to be added to bring it up to the Saarau or Seger cone No. 36 standard. Moreover, it was thus possible to work at a lower temperature, with a saving in time and gas-carbon, and a prolongation of the life of the furnace-lining.

The method may, of course, be varied. For example, the writer has toned up low-grade fire-clays with bauxite until they showed the same behavior as certain high-grade fire-clays, or their equivalents in terms of Seger cones.

The silica used in the experiments was quartz, ground to pass a 100-mesh sieve and purified by boiling with nitrohydrochloric acid. Upon analysis, it showed 99.88 per cent. of  $\text{SiO}_2$ , and was assumed to be pure. The alumina was obtained from the Solway Process Company, Syracuse, N. Y. An analysis furnished by the makers showed  $\text{Al}_2\text{O}_3$ , 98.46;  $\text{SiO}_2$ , 0.25;  $\text{Na}_2\text{O}$ , 0.50;  $\text{Fe}_2\text{O}_3$ , 0.04; loss by ignition, 0.75 per cent. As the substance readily absorbs moisture, a sample was ignited, which gave a loss of 6.42 per cent.; and an allowance for this loss was made in all the work the clays tested were kindly furnished by Prof. Edward Orton, Jr. Their composition and the results of the tests are shown in the accompanying table.

ANALYSES OF CLAYS AND RESULTS OF TESTS.

| Sample No.                        | 26*       | 25*       | 3*        | 22*       | 24*       | 23*       | 1982†     |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                   | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| $\text{SiO}_2$ .....              | 64.10     | 55.60     | 57.10     | 57.45     | 57.15     | 49.30     | 43.94     |
| $\text{Al}_2\text{O}_3$ .....     | 21.79     | 24.34     | 21.29     | 21.06     | 20.26     | 24.00     | 11.17     |
| $\text{H}_2\text{O comb.}$ .....  | 6.05      | 6.75      | 6.00      | 5.90      | 5.50      | 9.40      | 3.90      |
| Total.....                        | 91.94     | 86.69     | 84.39     | 84.41     | 82.91     | 82.70     | 59.01     |
| $\text{F}_2\text{O}_3$ .....      | 2.51      | 6.11      | 7.31      | 7.54      | 7.54      | 8.40      | 3.81      |
| $\text{CaO}$ .....                | 0.10      | 0.43      | 0.29      | 0.29      | 0.90      | 0.56      | 11.64     |
| $\text{MgO}$ .....                | 0.58      | 0.77      | 1.53      | 1.22      | 1.62      | 1.60      | 4.17      |
| $\text{K}_2\text{O}$ .....        | 2.62      | 3.00      | 3.44      | 3.27      | 3.05      | 3.91      | 2.90      |
| $\text{Na}_2\text{O}$ .....       | 0.03      | 0.09      | 0.61      | 0.39      | 0.58      | 0.17      | 0.71      |
| Total.....                        | 5.84      | 10.40     | 13.18     | 12.71     | 13.69     | 14.63     | 23.23     |
| Moisture .....                    | 1.10      | 2.65      | 1.30      | 1.90      | 2.70      | 1.20      | 15.66‡    |
| Grand total. ....                 | 98.88     | 99.74     | 98.87     | 99.02     | 99.30     | 98.54     | 98.00‡    |
| Stiffening ingredient, p. e. .... | 20        | 40        | 60        | 80        | 80        | 100       | 180       |

\*Analyzed by N. W. Lord.

†Includes  $\text{CO}_2$ .

‡Analyzed by E. Orton, Jr.

§Includes  $\text{P}_2\text{O}_5$ , 0.10 per cent.

The method of operation was to weigh out samples of 1 gramme of the clay to be tested (the moisture being allowed for); mix them severally with 0.1, 0.2, 0.3, etc., gramme of the silica-alumina flux, in small porcelain dishes; turn out each mixture upon a glass plate; moisten it with a 10 per cent. extrine solution; work it with a spatula until it had acquired the right consistency, and mold it into the form of the small-size Seger cone\*. When dried, three of them were placed in a crucible with a Seger cone, No. 26, and so heated in the Deville furnace as to melt down the Seger cone. In addition to the usual 30 grammes of paper and 200 grammes of charcoal, from 920 to 925 grammes of gas-carbon were required, with a pressure of blast of about 1 inch water. A fusion required about 35 minutes.

In the table above, the clays are arranged according to their degree of refractoriness. Sample No. 26 requires 20 per cent. of flux to raise its melting point to that of Seger cone No. 26; sample No. 25 requires 40 per cent., and so on.

\*Trans., xxv., pp. 10 and 11.

\*\*From the Transactions of the American Institute of Mining Engineers. Buffalo Meeting, October, 1898.

†Thonindustrie-Zeitung, 1893, p. 1252; Berg-und Huttenm. Zeitung, 1894, p. 119; The Clay-Worker, August, 1897.

‡Trans., xxv., 3.

§Thonindustrie-Zeitung, 1896, No. 63; Berg-und Huttenm. Zeitung, 1897, p. 21.

‡Dingler's Polyt. Jour., exxvi., pp. 438, 525; exxviii., p. 396.



In order to check the method, tests were made in two ways with large-size Seger cones. In the first, cones Nos. 1 to 25 were pulverized and toned up with the silica-alumina flux. It was found that 0.036 gramme of the flux, added to one gramme of Seger-cone substance, would raise its melting-point to that of the next higher number. In the second, two clay-samples, Nos. 22 and 23, which, according to indirect preliminary tests, ought to melt down at the same time as Seger cone No. 4, were placed in a graphite crucible, the bottom of which had been tamped with refractory clay, and were heated in a coke-furnace with under-grate blast. In two hours the test was finished. The two clays snowed in the fire approximately the same behavior as the Seger cone, thus again proving the accuracy of the method.

This modification of Bischof's indirect method may also be used for determining the resistance of fire-clays or fire-bricks to the corroding influence of sodium chloride, sodium sulphate, sodium carbonate, potassium carbonate, etc., to which they are exposed in glass pots, or to calcium carbonate, lead oxide, iron oxides, etc. To illustrate the operation, samples of 1.5 grammes of clay are mixed severally with 5, 10, 15, etc., milligrammes of flux, formed into small-size Seger cones, and heated in the Deville furnace with Seger cone No. 26, in such a way that the Seger cone will melt. Here, again, the sample which shows the same behavior as the Seger cone will be the critical mixture, and the percentage of flux it contains will form the criterion of the clay's resistance to corrosion. It is true that the results obtained do not altogether determine the suitability of a clay for the manufacture of glass pots, as the requirements\* of such a clay are not only that it shall resist heat and fluxes, but that it shall be highly plastic and burn dense at a comparatively low temperature. Nevertheless, the results obtained by the method form a valuable guide in the making up of mixtures. This was proved to the writer by the results with certain clays, selected on account of their good behavior under the tests, which turned out a true prediction of what occurred on a large scale afterwards.

The method can, of course, be applied to a number of cases where an acid furnace material is to be exposed to the corrosion of a basic charge, and vice versa.

Note by the Secretary.—Comments or criticisms upon all papers, whether private corrections of typographical or other errors, or communications for publication as "Discussion," or independent papers on the same or related subjects, are earnestly invited.

\*Seger-Cramer, *Thonindustrie Zeitung*, 1897, p. 47.

### DRY-PRESS BRICKMAKERS, PLEASE NOTICE.

Through an error, the new press for ornamental dry-press brick made by the Ohio Ceramic Engineering Co., of Cleveland, was described in the September number of the Clay-Worker as a re-press instead of a dry-press. The error was an unfortunate one, as through it the real purpose of the superiority of the machine was lost sight of.

In order to set the trade aright on the matter, and to give the manufacturers the credit they deserve, we ask our readers to turn to page 199 of the September Clay-Worker and take another look at the illustration of the dry-press, and again call attention to the points of superiority claimed for it.

First, that it will make brick with ornaments either on the end or side, or the edge, which is a very valuable feature indeed, and has, as far as we know, never been accomplished before.

Second, the brick are made of even thickness throughout, by reason of two screws, thus securing an equal pressure on all parts of the brick.

Third, the machine gives top and bottom pressure.

Fourth, all brick are made uniform, because of automatic stop.

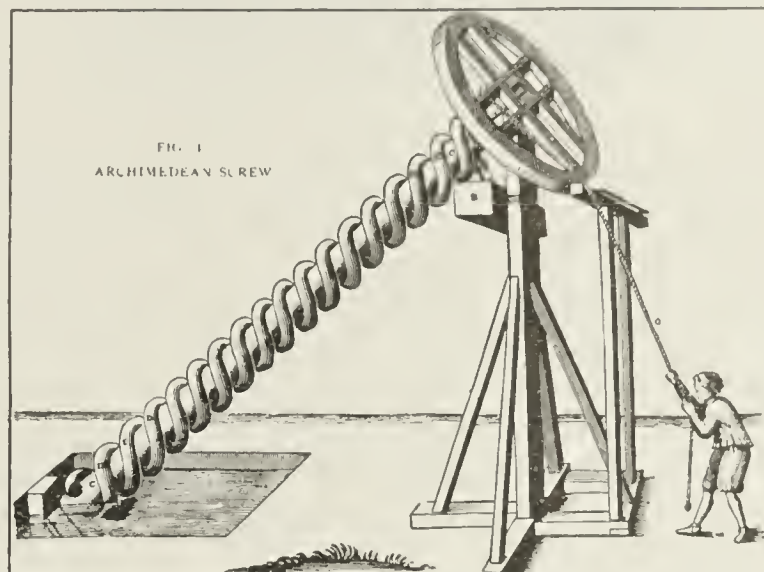
Fifth, the machine is adapted for making key brick.

Sixth, it is very simple of operation, and very powerful, and is, therefore, practical, inasmuch as it does its work well, without constantly getting out of working order.

Seventh, can be used by hand or with power.

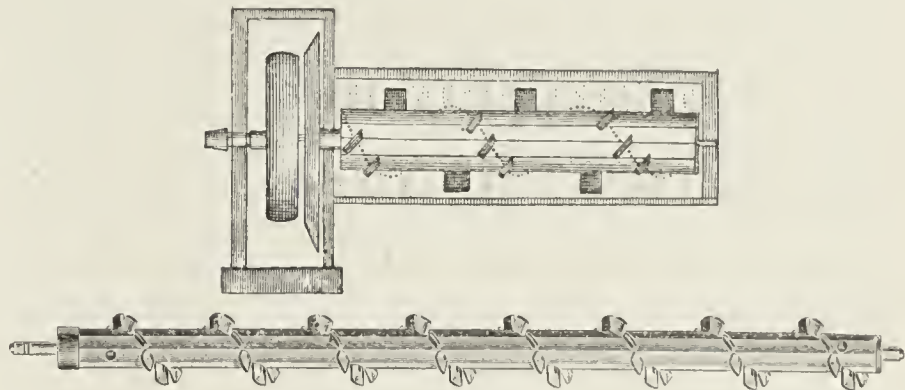
### THE STORY OF AN INVENTION.

A very neat little booklet has been published by H. W. Caldwell & Son Co., Chicago, entitled, "The Story of an Invention." It tells in an interesting way the evolution of the spiral conveyor. "Most inventions," says the author, "are of gradual growth, and tracing the development of a machine or process



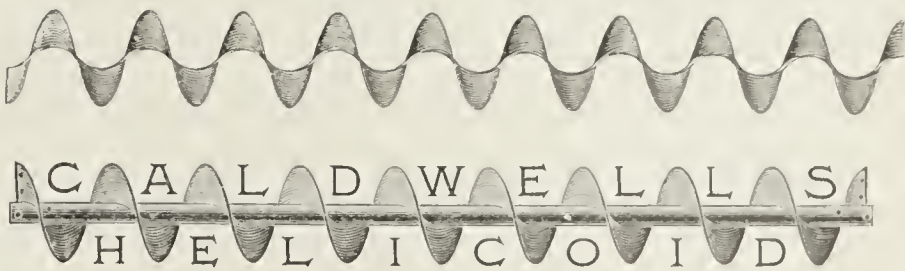
will generally prove that the improvements through years of effort by many minds are necessary to produce the degree of perfection that has been attained. The most familiar mechanical element, the screw, in that variation which is applied to the transmission or propulsion of materials and which is known as the screw or spiral conveyor, presents an interesting study of the evolution to a perfected mechanical appliance from a crude apparatus of but little practical value.

"A common, but mistaken, idea seems to prevail among me-



Primitive Conveyors.

chanics that the screw conveyor has its genesis in the screw of Archimedes and that therefore the conveyor has even less claim than most machines to be 'something new under the sun.' Such error is due to a superficial acquaintance with the operation and construction of the Archimedeal screw. That device, whose office was to raise water for irrigation from a lower to a higher level consisted in olden times of a hollow tube (probably of leather) wrapped spirally around a central core or shaft. This device was placed at an angle, with the lower end dipping into the water supply, and when it was revolved the water



entered the mouth and was gradually passed up the spiral tube until it was delivered through the opening at the upper end."

This mechanism is illustrated, and we produced a miniature drawing for the special benefit of our younger readers who are interested in mechanics, also views of other conveyors showing the evolution of this device from the primitive to the most modern form, The Caldwell Helicoid. A copy of this little work will be sent free to any of our readers who are sufficiently interested to write the Caldwell Co. for it.





## OFFICIAL ANNOUNCEMENT.

**The Thirteenth National Conventional of Brickmakers to  
be Held at Columbus, Ohio, February 7 to 10, 1899.**

**A**FTER CAREFULLY considering the advantages offered by the cities of Omaha, Philadelphia and Columbus, where we have been invited to hold our next annual convention, we have decided to accept the invitation tendered at Pittsburg by Prof. Edward Orton, Jr., on behalf of the Columbus Board of Trade and the Ohio State University. The Convention will be held at Columbus, Tuesday to Friday, February 7th to 10th, 1899.

We were influenced in favor of Columbus from the first by the enthusiastic applause with which the Convention greeted Prof. Orton's announcement that Columbus wanted the Convention, and he hoped the invitation would be accepted, that the members of the N. B. M. A. might have an opportunity to visit the School of Ceramics which they had so generously supported. The plaudits which followed and the subsequent expressions from individual members evince an earnest desire on the part of a majority of our members to accept this invitation. In addition to this, the central location of Columbus, and its unrivaled railroad facilities and excellent hotels make it an exceptionally desirable place of meeting.

As our members may readily gather at Ohio's capitol from all quarters, East, West, North or South, with equal facility, we feel assured that a large and successful Convention will result. The usual arrangements for reduced rates will be made and announced with other details in due time.

## THE EXECUTIVE COMMITTEE,

Theo. A. Randall, Secretary.

Wm. Flinn, President.

## SLATE AND SHALE.

**S**LATE, LIKE BUILDING STONE and limestone, is quarried from the earth's crust and is found in the strata close above the metamorphic rock, near the beginning of what is called the primary, or paleozoic period. As compared with the coal formations it is very, very old. There are different substances called slate that are not slate in the scientific use of that word. In general all stone formations are called slates that split up into thin layers. But the true slate is a special material which is formed by special processes of nature. The difference between slate and shale, for instance, is not one of ingredients, but of the process by which the ingredients are put together. All of the sedimentary rocks are formed by a deposit in the bottom of the ocean. At one period the floods have brought down a certain kind of material in greater profusion than at others, and this is deposited in thin layers, and as it hardens there will be seams in it and the stratifications will be differently colored, the color depending upon the deposit at any particular time.

A bed of shale, like a bed of coal, has lines of cleavage in it, and if it is examined under a microscope it will be found that the sedimentary particles, like twigs and leaves in the coal

veins, lie with their longest dimensions in line with the plane of cleavage. Shale in color looks like slate, and an analysis of the material of which it is formed shows that shale and slate are both made from the same. There is, however, a structural difference between the two which is very peculiar and very interesting. The slate is ordinarily a denser material, and the lines of cleavage are often at right angles with those that we find in ordinary shale. A slab of shale will be of a uniform color on any one line of cleavage. The color may change at the next line, and generally does to a slight extent. It is easy to see them if we could change the lines of cleavage in the shale so as to run at right angles with their present lines. The face of a slab would show bands of different colors or shadings, such as we often see in slate. If we take a piece of clay that has been thoroughly mixed and subject it to a very great pressure and then examine the piece that has been submitted to pressure under a microscope and compare it with a piece of the clay after it has been thoroughly mixed, but has not been submitted to pressure, you will find that the two are very different in structure. The pressed clay will show that the particles of which it is made up have all turned, so that their longest dimensions are in a line at right angles with the direction of pressure. Here is an interesting fact that we must remember. And it is in this that we find the reason for the structural difference between shale and slate. The lines of cleavage in shale are not formed necessarily by pressure, but because in the disposition of the material of which it is formed, the particles naturally laid themselves down so that their longest dimensions were on a horizontal line.

Ages after, when other rocks and other formations had been laid down on top of the bed of deposited mud, the upheavals of the earth have so changed the lines of pressure upon this material, and the pressure is so great, that a rearrangement of the particles of which the slate is made up as has taken place, so that their longest dimensions now are in a direction that crosses the stratifications as originally laid down.

The effects of this is twofold. First, the material is compressed into a denser form and the lines of cleavage are changed, or, to express it in more common language, the grain has been changed, so that when it splits up it runs crosswise of the original layers as the water deposited them, and this produces the different shadings so often seen in different slates.

Let us go back a moment to our experiment with a lump of clay. If we examine the mixture before submitted to pressure we would find that the oblong particles of which it was made up would stand in all directions, hit or miss, and if we should dry this lump of clay it would have no special lines of cleavage. But the moment we have submitted it to a certain amount of pressure, we find that lines of cleavage have been established, and that the particles have been rearranged so that their longest dimensions are all in one direction which coincides with the cleavage lines. If we should now take the same piece of clay and subject it to a pressure at right angles to that of the first experiment we would find that the lines of cleavage had also changed, and that the particles had all been rearranged. Apply the principle to the formation of slate, and we can understand how it happens that what we call the grain runs crosswise of the deposits that were made at different times. It is not a chemical, but purely a mechanical difference. Or, to express it differently, the difference is a structural one produced by mechanical causes. The origin of cleavage in slate has been the subject of much speculation and investigation, but, like many other problems, it was solved through the invention and application of the microscope. Thin layers of slate have been made the same as with limestone and chalk, so thin that light would readily pass through it so that an examination of the particles could be readily made, showing their arrangement under varied conditions. Science is indebted to the microscope for the solution of very many problems that for ages before had puzzled philosophers.—Elisha Gray, Ph. D., LL. D., in Times-Herald. (Copyrighted.)



## THE "OLD POST."

## Business Activity at Vincennes, Indiana's Oldest City—Large Demand for Building Brick—Need of Brick Pavements.



OW THAT THE WAR IS OVER, and the smoke of conflict has drifted aside, the air begins to clear, and the expectant multitude are hoping to catch a glimpse of the bright outlook. Experience teaches that the political atmosphere is cloudy and and murky at all times. If it is not thick and lurid with the smoke of war and battling, it is heavy with the dust kicked up by opposing factions and the strivings for political preferment for office and honors. Then, again, if the people turn in disgust from the noise and tumult of maddening crowds to look after their own individual interests, they soon find themselves in the midst of the whirling wheels of industry. Then the smoke and dust of shop and factory shut out all other sights and sounds.

The past season has been an eventful one in our history. It was only a matter of choice—select the atmosphere suited to your inclination; enter the army or navy, the arena of politics, or the more peaceful pursuit of agriculture or manufacturing.

There is indisputable evidence that as a nation we are about entering upon a new era of prosperity that is to be far-reaching, and, it is hoped, permanent. The happiness and contentment of the industrial world is the underlying principle which should govern the whole body politic. There is a broad smile on the faces of our people all over the land. The Cuban question was left to them for settlement, and is in a fair way for final and satisfactory adjustment. They are better satisfied with themselves and each other, and the masses are determined to have prosperous times. Money was spent freely, and has gone into the channels of trade, and will continue to flow there for a long time. As a consequence, there is work and wages for all.

The condition of trade and confidence in its stability is visible in the improvements of both town and country. The building trades are a sure index, to even a dull mind. When the sound of the saw and the hammer, and the cry of "more mort.," is heard, you can depend upon it that the merchant is looking forward to pay-day and purchasing new goods.

Vincennes is having a fair share of the good times. Factories are all at work, some running both night and day. There have quite enough buildings been contracted for to keep our workmen employed from early spring until late in the fall months or into the winter.

The Novelty Works moved into their new buildings a few weeks since, and have doubled their capacity. The Hartman Manufacturing Co. are building an entirely new plant, and enlarging the same for their already extensive trade. The Interstate Distilling Co. started up their new mammoth distillery this past month. All these operations mean the consumption of large quantities of brick. The High School building has just been completed, and will be occupied at the opening of the school term in September. It is a model school building, with all the modern improvements, and equipments up to date. It is built of pale buff pressed brick, with terra cotta trimmings to match, and cost about \$20,000. It is a handsome structure, and is equal in all respects to any school building in the State or elsewhere. The county has also under contract and nearing completion an Orphans' Home, a commodious building of brick, which will fill a long-felt want in providing a home and properly caring for the orphans of the county. The Presbyterians have contracted for an addition to their already large and commodious church house, and will double their present seating capacity. The Methodists have plans prepared, and will soon receive bids on a fine church edifice. This, we believe, is to be built of stone, although brick will enter largely into its walls and foundations. The Ebner Ice Co. have but recently doubled their capacity and storage rooms. The Hoffman Block has been enlarged by the addition of two new store rooms. A score or more of new cottages are under way in various quarters of the city, some of them of more than moderate cost. The city is about to reach out and enlarge its borders on three sides. State pride and the Wabash river alone keeps it out of Illinois.

## —Among the Brickyards.—

There are two brickyards in this place to supply the home market with common brick. The old Vincennes Brick and Tile Co. was in litigation quite a long time, and has necessarily been somewhat neglected, although its owners kept up a show of business, and operated it on a reduced scale from its former standard of excellence, when friends Morrison and Wingard were struggling with the problems of improved methods of drying and burning brick, and were making experiments by the light of the kiln fires. The yard is now known as the Sugar Loaf Hill Brickyard, Frank Clark sole owner and proprietor. He has a 45-horse-power engine, Martin machine, and dries on a rack and pallet system.

The yard formerly made large quantities of drain tile, and at present is equipped with two tile machines and an excellent tile kiln. Under the present management no attention is paid to this branch of the trade. The yard and clay bank are both located on a hill, with an abundance of good clay suitable for common building brick, but at present its supply of tile clay is quite limited. They have an inexhaustible water supply from a drilled well 125 feet in depth. The present owner being also owner of a coal mine located a few rods distant from the works, they have an abundance of cheap fuel for burning. Run of mine is used. They have permanent kilns with furnaces. Unfortunately, this yard is not located on or near the railroad, and are not prepared to ship in large quantities, and everything has to be hauled both to and from the yard by wagons.

The yard of Mr. S. Kixmiller is located alongside of the tracks of the Evansville & Terre Haute and also the Indianapolis & Vincennes railroads, being conveniently located in every respect, except that when the Wabash is on a spring tide the clay bank is flooded, making it necessary later to pump the water out of it to resume work. There is about seven feet of good loamy clay, suitable for common building brick, underlaid with a strata of good tile clay of varying thickness. No use is made of this clay at present, as Mr. Kixmiller is not equipped for manufacturing tile, and it requires harder burning to make brick than the top clay.

This yard is equipped with a Quaker machine, and has been in use about ten years. They make at present about 22,000 per day. They dry on racks and pallets, having capacity for 165,000. They have permanent kilns, with furnaces, and make some excellent common brick, which look, when selected and properly laid, almost equal to pressed brick. Mr. Kixmiller made 1,000,000 brick in 1897, but contemplates making 1,800,000 the present season. He sold out all his stock of brick soon after he closed down last fall, and for several months had no brick on hand. He is busy stocking up before fall weather comes on.

Mr. Kixmiller is a live, progressive brickmaker, and takes great pride in his work. We found him at work among his men, with a wheelbarrow, wheeling pallets to the machine, the pallet boy having gone to the picnic.

The yard of Mr. Frank Clark is already stocked up, all kilns are full and the yard has closed down. They will hardly start up again this season.

There has been but little attention paid to the paving brick industry or street paving in the city as yet. In talking with property owners or brickmakers, they seem to think it an unnecessary expense to put down brick paving. Their argument is, that the people are too poor at present and heavily taxed; also, that this is a dry town, being located on top of an immense gravel bank of considerable depth, and water will not stay on the surface. Nevertheless, the city council are gradually encroaching upon the matter, and we notice in the report of their proceedings an item of expense for paving brick brought from Evansville. This signifies that they are paving the alley crossings, guttering, stable floors, street crossings, area-ways, etc. It is only a question of time when they will cease their wasteful extravagance of hauling in gravel to replace the mud hauled off the surface. The Union Depot grounds have the largest brick pavement in the city, all their platform and sidewalk being handsomely paved, and is an object-lesson to the thousands who tramp up and down over it every hour of the day and night.

In comparison with the times when business was booming, in the "seventies," brick men say they are paying the same wages for yard help, and nearly the same for fuel and other expenses. Now they are glad to sell at \$4.50 to \$5 per M., whereas they used to get from \$5 to \$7 per M. for the same grade of brick.

J. A. REEP.





THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

#### Good News From Denver.

Editor Clay-Worker:

Enclosed please find P. O. money-order for \$2 to continue my subscription to the Clay-Worker for the ensuing year.

There have been no new works of any consequence established in the city recently, but several of our old brick manufacturers are increasing their works by the addition of winter yards by putting in dryers and dry floors, among them being Geo. W. Robinson & Son, A. J. Baker & Co., B. F. Merchant and Wm. Boyle and several others, on a more or less smaller scale. The brick market has been steadily improving for the past four months. Prices have advanced from \$5 to \$6.50, and demand quite active. Public improvements calling for large amounts of brick and sewer pipe are being agitated, and will no doubt materialize. The general outlook is much improved, for which we of the West are very thankful and much in need of, after several years of comparative idleness and beggarly competition.

Wishing the Clay-Worker more prosperity in the future than in the past, I remain, yours fraternally, WM. BOYLE.  
Denver, Colo., Oct. 31, 1898.

#### How Can we Promote Brick Structures?

My Dear Bro. Randall:

At the Pittsburg convention of the N. B. M. A. a committee was appointed to collect facts and arguments and have them printed in a short and concise form and distributed to members of the Association to use in inducing people to build brick buildings instead of wood.

This committee has worked long, hard and well. They have sent broadcast over this land hundreds of letters urging co-operation and desiring information. The mountain labored, and this committee believes wood construction has gone right on as in the days of the past, but we have learned one thing. The manufacturers of clay products are a busy people. Some have not had time to answer our letters. Some have kindly answered, but gave us no key-note or facts upon which to build. All who have answered our letters were very courteous and wished us a prosperous journey in our undertaking. All of this was good as far as it would go, but it did not make a book or compile facts. We bank on the men of our Association as the grandest crowd of business men that have ever met together in any city of our country, but we are compelled to cry out in the words of the good book, "How can you neglect so great a salvation?"

We believe it is within the province of the clay manufacturer to increase his market. This must be done by educating the people to a higher standard. We must take hold of this question as we take hold of the difficult problems of our business, and before we leave it every manufacturer must help solve it for his own district.

I have been instrumental during this season in changing three wooden houses into brick. I had to argue, talk and state facts, and brick came off victorious.

Now, let every one of our readers and membership start in on this good missionary work, and the results, we believe, will surprise us all and be very far-reaching.

And now, my dear Brother Randall, we know how hard you

and the other clay journalists have worked to benefit and uplift our craft, and, while we admit you have worked long and faithfully, we do not propose to discharge you from this war. This subject must be taken up by the clay journals of this land, and the clay manufacturers must be brought to realize that this subject is vital; that they can and must give it some of their attention. Through the pages of your journal you can do more than any regiment of men, and we earnestly urge that you take up this issue in every paper, and urge your subscribers to write upon this subject and to dig for facts which when presented will strike home to the people the unfailing truth that fireproof construction is more enduring, economical and beautiful than any material yet known to the world.

Syracuse, N. Y.

C. H. MERRICK.

#### Wants a Small Brick and Tile Plant.

Publishers Clay-Worker:

I beg to acknowledge receipt of yours of the 5th, and in reply would say, that I am in the market for a plant, that is to say, I have some gilt-edge property that I would exchange for a brick and tile plant if I could find one to suit me. I was engaged for several years previous to 1890, in the manufacture of brick and tile in Michigan, and deemed myself retired. But having become interested in the later developments of hollow block for architectural purposes, and having a son whom I wish to establish in business, I am moved to take up the business again. As to location, I must be governed somewhat by opportunities which may be developed. A location near the coal fields or in the gas belt would be preferable. Suitable clays for blocks as well as the various forms of machine-made tiles are, of course, indispensable. A small plant representing an investment of from \$5,000 to \$8,000 would suit me. I do not care to go into the making of common brick, neither would I wish to make pavers.

The brick trade in this section, so far as I am able to judge, is holding its own, although building in general has been greatly retarded of late by the low price of cotton and other shrinkage in values, yet there are few towns of any note in this section that cannot boast of new buildings of brick, notwithstanding that lumber is very cheap here. There are a number of fine brick plants established in the South mainly devoted to the making of common brick. This section is chiefly supplied by the Chattahoochee Brick Co., located on the Chattahoochee river at the crossing of the Southern R. R., about ten miles west of Atlanta. This company employs state convicts and turns out a very large amount of very good red brick. Some very fine front brick of a light straw color are being made at Oxford, near Anniston, Ala., also paving tiles.

The state of trade in the South may yet be regarded as in its infancy. Ultimate developments are sure to bring it to the high-water mark, although progress will be retarded by the conservative tendency of the people as well as the cheapness of lumber for a time.

PROGRESSIVE.

Tallapoosa, Ga., 11-11, '98.

#### Wire-Cut vs. Molded Brick—An Inquiry.

Editor Clay-Worker:

I notice your description of the new brick plant at Montezuma, Ind., in the last issue of the Clay-Worker. I was much interested in the article, because of the statement made "that the contractors and masons are finding that stiff clay or wire-cut brick are just as good and desirable as the old hand-made or machine-molded article." Now I am interested in seeing stiff-clay brick introduced in the Indianapolis market, so, after reading the above statement, I felt that Indianapolis would be a good point, as well as a profitable one, for me to visit, hoping to do some business. Upon my arrival and inquiry of local brick manufacturers regarding this great change in the masons, the first thing I learned was the fact that the Marion Brick Works



had just placed an order for a Potts soft-clay brick machine to be used on the Montezuma yards. Now, I would like to know why this sudden change was made, when the stiff-clay brick are claimed to be just as good as the soft-clay, and can be made for less money per thousand. We are all surety after the almighty dollar, and, unless there was some urgent reason, it does not seem reasonable that the Marion Brick Co. would put in a new soft-mud machine, which would add to the first cost of their brick. Was it not because the soft mud machine makes a better brick or one that is better liked by the masons and builders of Indianapolis? Will Mr. Butterworth please give his reasons for this change? He surely has a good one.

ATTENTIVE.

#### Ex-President McAvoy Sends Greetings From the Summit of the Rockies.

My Dear Randall:

Your letter relative to time and place for our next N. B. M. A. Convention, reached me here in Colorado Springs, where I have been sojourning for several weeks for the benefit of the health of my oldest daughter, who, I am glad to say, is improving.

I am heartily in favor of holding the convention in Columbus. Don't think of a more desirable place. We can certainly have a fine convention there, and I now fully expect to be with you and again greet my many brickmaker friends.

This is a beautiful country. In the fifty days we have spent here there has been but one day that the sun did not shine. This city is beautifully laid out on a plateau of land, part of what is known as the great American plain, seven miles from the mountains, but on looking towards them you would think they were about 500 yards away. The streets run north and south, east and west, and are over one hundred feet wide, with an abundance of shade trees on the sidewalks and beautiful squares. The people are what the Spanish General Blanco would call nobodys, or in other words, they are composed of the very best people from the different States. In all my travels I have never met a more industrious, mild-mannered people than those of this city. There are no saloons, no drunkards, no corner loungers; the most timid could walk the streets at any hour of the day or night without fear of insult. The air is light and dry under all conditions. It is surely one of the grandest health resorts in the world.

I have taken little side trips since I have been here; have visited Manitou, six miles away where the springs are, as there are no springs here, it seems funny that they should call this place the springs. Went up through the pass to Cripple Creek, Gold City, Altman, which is the highest incorporated city in the world. Traveled over the mountains in a trolley car at an attitude of 11,500 feet; telegraphed by highest regards to the boys in Philadelphia from the top of Pike's Peak; visited Denver during the carnival, it was a grand affair.

If the people of the East knew that there was such a country as this in America, I am sure there would be less travel to Europe. The scenery is grand beyond description, the climate is most agreeable. There has been no rain in the last two months; the air is crisp and cool, yet one does not suffer any inconvenience from it.

This would be an ideal climate for brickmaking. I can't help feeling sorry for those at home who are not fitted for winter work and who are just now trying to finish the last kiln. I know what trouble they are having, for I have been there many a time myself.

Was very sorry to hear of ex-President Morrison's illness, and hope it will not be serious. I see by the papers that our President Flynn, of Pittsburg, met with a sad accident. While out riding in the park his horse threw him and he sustained serious injuries, which I hope are not fatal.

Colorado Springs, Colo., Nov. 10. THOS. B. McAVOY.

#### PACIFIC COAST NEWS.



IF THE LOCAL TRADE in brick very little can be said. The situation is just about the same as reported last month. The supply is much more than the demand and while this continues no activity can be expected. With the country trade it is different. We hear of brick burning going on in different sections, and of brick buildings being erected, which indicates that some activity prevails in the State. Arizona, Washington and Oregon, appear to be prospering, as from these

States come reports of contemplated brick making establishments. While the local situation is not encouraging to the brick and clay industry it is a great relief to know that the extreme dullness does not extend all over the Coast.

It is reported that the brick yard at Eagle Harbor, Wash., will start up again. The machinery has been idle for a long time, and it will very likely take some time before the manufacture of brick commences again.

William Hutt has finished burning his first kiln of brick in his new yard at The Needles, Cal. The kiln consists of one hundred thousand standard size bricks, and has been sold already.

Fires have been started under a kiln of 600,000 brick at the Napa, Cal., Insane Asylum.

William F. Lambert, an experienced brick manufacturer of Snohomish, Wash., was recently in Blaine, that State, looking over the ground with a view of locating and establishing a brickyard there. Mr. Lambert considers the outlook for the brick industry excellent in the country in and around that section.

The Dallas, Oregon, brick and tile works have closed down for the season. Two hundred thousand brick were burned and 15,000 feet of tiling made.

Work on the fine new court house at Sonora, Cal., is progressing rapidly. Of the entire half million of red or common bricks to be used in the construction of the building, 300,000 have been laid already, while of the ornamental brick, known as buff or Roman, over 40,000 have been placed. About 80,000 of the latter kind will be used.

C. E. Grouard is furnishing the brick for the Bristol & Rowley block at San Diego, Cal. About 250,000 will be required.

John P. English has just finished burning 300,000 brick at Hanford, Cal.

The contract for the brick for the seven buildings for the United States Army Post, at Magnolia Bluffs, Wash., has been let to W. A. Bragg, of Puyallup, and S. A. Simmons, of Tacoma, Wash.

The Copper Co., of Jerome, Arizona, has let a contract for another million brick to Hines & Miller, who have already commenced on the work at Jerome Junction. The bricks are for the hotel and Masonic hall.

SUNSET.

#### THE CHICAGO SITUATION.

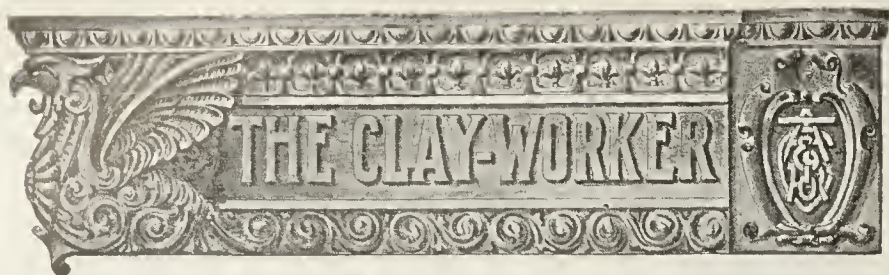
WITH THE FROSTS of November the building season of 1898 formally comes to an end, but so many new buildings and projected buildings were launched during August and September there is only a moderation of activity in building lines. The dealers of front brick are very busy, and the demand exceeds the supply in high-grade fronts. There is also a great demand for sand-mold brick of a good color. Cement dealers are still away behind on their orders. One concern here is in the market for 30,000 pounds, and cannot be supplied.

It is hard to hazard a guess on the building season of 1899, but all conditions are favorable for the best year we have had in five years. A large number of plans have already been completed for buildings to be erected next year, and nothing short of a financial panic will be able to hold back 90 per cent. of the work. So you see by the outlook we poor hustlers in Chicago can see the shadow of three square meals per day for next year.

ENERG.

Chicago, 11-5-'98.





*Entered at the Indianapolis postoffice as second-class matter.*

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

#### FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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#### CURRENT COMMENT.

The one chief event of the month is the election. Whatever one's political preference, it is a source of infinite satisfaction to know that both branches of Congress are in sympathy with the Executive. There will be no disturbing of present conditions. Stability is assured for at least two years, and stability is the chief factor in commercial and business affairs.

\* \* \*

It is not difficult to foresee the effect of this condition upon trade interests. With all doubts as to currency and tariff tinkering removed, with the legislative and executive branches of government harmonious, the manufacturer and merchant can put aside all fears and doubts and launch out in any worthy enterprise with an assurance of success commensurate with the degree of energy, ability and capital invested.

\* \* \*

The wise clayworker will accept the situation gracefully and plan to make the best of the existing conditions, which are certainly most promising and justifies the prediction that we are now entering one of the most prosperous eras in our history. The wide-awake brickmaker should put his affairs in order for a busy year. Spend the winter season in preparing for the increased demand for your products, so you can push your business, and not let it push you.

\* \* \*

Another important thing to do is to get on good terms with your competitors. Cultivate a friendly feeling with your neighbor brickmakers. Perhaps you are not very cordial just now, and maybe its not altogether their fault, but, be that as it may forget past differences and be neighborly and see if you can't agree on some plan by which you can sell your brick after

they are made for a reasonable advance over actual cost. Remember the old conundrum, "What shall it profit a man to make all the brick in the world, if they are sold at a loss?"

\* \* \*

Be wise in your days of promise by being neighborly, and the reward of profit shall be yours. As helpful means to these desirable ends we suggest a careful perusal of the Clay-Worker, ads and all. In no other way can the progressive brickmaker get the same amount of information. Next, attend the Conventions, both State and National. Get away from the daily grind for a little while, mingle with the broad-guage, go-ahead men of your own calling. It will pay a very large dividend. You will think more of yourself and more of your profession. more of your neighbor, especially if you can get him to accompany you. Talk to him about it, and see how easy it is to get together on a matter of common interest. In short, be friendly and the clouds of worry and trouble will pass as quickly as the mist before the sun.

#### CONVENTION TIMES.

As announced on a preceding page, the thirteenth annual convention of the National Brick Manufacturers' Association will be held at Columbus, Ohio, Tuesday to Friday, February 7th to 10th, 1899. Arrangements are now being made that will insure a very enjoyable week for those who attend, and we predict one of the largest and most successful meetings in the history of that body.

#### THE PAVING BRICK TRUST.

The daily press of the country has teemed with various accounts of a gigantic paving brick trust including all of the principal plants in the country. Among other little details, this modern octopus is said to have secured options on all the clay machinery manufactories in the land, and by controlling the sale of machinery prevent the starting of new paving brick plants. Great scheme that. Our one regret is that we are not possessed of a few hundred thousand dollars of stock in the "combine."

#### R. B. MORRISON SERIOUSLY ILL.

We are grieved to announce the serious illness of R. B. Morrison, Rome, Ga., who is suffering from nervous prostration, due to overwork. Among all our able contributors, none are more esteemed by the rank and file of the clayworkers of America than "R. Brick." His "Hints on Brickmaking" gained for him a world-wide reputation. During the past fifteen years but few issues of the Clay-Worker but have contained some instructive communication from his fertile, forceful pen. His monthly offerings will be missed by our readers, who we know will most earnestly echo our wish that he may speedily recover his wonted health, and again assume an active part in the brickmaking world, to which he has devoted his life and rendered invaluable service.

#### THANKSGIVING DAY.

The proper authorities, the President and the Governors, have called upon us to render public thanksgiving on the 24th inst. for the many blessings we have enjoyed as a people during the year just closing. This is well, and the day should be universally observed. Business should be suspended, and the place of prayer and thanksgiving should be attended and public thanks should be rendered.

As with individuals, so with nations. Every life is checkered. Every day has not had an unclouded sky in national life, but behind every cloud has been a sun which has fringed the cloud with a brightness which has assured the beclouded



that "The darkest day, live till to-morrow, will have passed away," so that there was occasion for thanksgiving even in the midst of glooms.

A review of the year's experiences as a people gives us unusual occasion for national thanksgiving. The labor of the husbandman has never been rewarded with more bountiful harvests, and the artisan and the manufacturer, and the merchant and the transporter, and the unskilled laborer, even, has never been more profitably and constantly employed, adding to the wealth of the nation by adding to individual comfort. But most of all have we occasion for thanksgiving for the propitious opening of the new national life upon which we have entered. For a hundred years we have been preparing for this hour, so that when the clock of destiny struck it found us no babe in swaddling clothes, but a stalwart nation, ready to take our place among the powers of the world, with no disposition to molest other nations, nor in a mood to tolerate molestations from them. The American who does not make mention of our propitious entering upon our new era, the era for which all preceding eras were rudimentary and preparatory, fails to recognize a chief cause for thanksgiving.

Clayworkers generally have many things to be thankful for. Never before have the products of their kilns been in greater demand. Never before have we faced more promising times. Surely the humblest of us may find some cause for thankfulness. So, let us celebrate and enjoy a day of peace and plenty, with grateful hearts for the good things provided.

#### PAVING BRICK AND HOW TO LAY THEM.

While it is probably true that in no country in the world is better brick paving material made than we are now making, it is also true to a certainty that in no country in the world is there more abuse, more uncertainty or more stubborn ignorance shown in the laying of that material than with us. In Holland the brick pavement is much older than with us. They were laying them solidly on concrete foundations when we were trying to assure ourselves that other less stable foundations were equally as good. James Taylor tells on another page of this issue how brick pavements should be laid. Will the contractors and engineers heed his suggestions, which are clearly in the interest of better pavements, or go on putting down good brick in faulty and unskilful ways?

#### THE IMPORTANCE OF GOOD FOUNDATIONS.

The Clay-Worker is publishing some rather extraordinary matter on paving brick. In the language of the street, paving brick appears to be getting in the game. There is more satisfaction in sitting squarely up to the table and playing a hand like a man than there is in fishing in from a corner, or playing over the heads of the other fellows. We cannot help thinking that the lack of appreciation accorded many people and things is due, not to the public as an apathetic body, but often to the people and things themselves. We are quite inclined to think that this is true of brick as a paving material. This material was pushed onto the market when few of us knew much about it. Some one had made a success with brick as a paving material. It was known in a general way that they should be hard and have certain other qualities which were more or less indefinitely understood. The result was that at the beginning a great deal of material was used that discredited the brick paving idea. As it is, few of the engineers and certainly a small part of the public are up to the idea of the proper foundation. Even the manner of laying them and the character of the intersections is in a pioneer state with many of us. Some months ago we had an article on the brick paving on Washington Street, in this city. There they have

brick in the gutters and brick between the street car tracks with a small strip of asphalt between. They have used asphalt where any material would answer the purpose, and brick where the pavement is subject to the heaviest strain. The brick in the gutters is laid right on a concrete foundation. We mentioned this fact when they were being put down. The material between and on each side of the tracks is a good paving brick, but is laid on a sand foundation—a good sand foundation carefully put in. But a sand foundation is never a good one for the direct application of a pavement, and is essentially a failure from the start on any street where there is heavy traffic. The brick between the tracks on the street mentioned are good and they are well laid, but on an inferior foundation. The pavement in the gutter on its concrete foundation with the brick bedded in Portland cement, flushed and filled with Portland cement between the joints is a success, and will last longer than any of us who are interested in paying for it. One of our local engineers says that this pavement is standing in a situation where asphalt would be knocked to pieces in a few days by the horses' feet.

#### A NEW ARCHITECTURE.

Polychrome architecture—architecture in many colors—is the next step. If it be well done in the beginning, it will be a step in advance—a long one, with others to follow. If it be well done, it will mean a general advance in the interest of clayworkers. If not, the general movement will be slow. Under any circumstances, polychrome architecture must come in time. It has been hindered in the past by work badly done. The Jewish Synagogue in New York was designed by a color-blind architect, and executed by color-blind colorists. The result was that polychrome architecture in America got a blow so severe that after more than twenty years it has not regained consciousness. Had that structure been a success, there would have been encouragement on the part of the people to build others. But even when the architect who was a colorist said anything about a colored facade, the client thought of the failures and said no, effectively. There are men in this country, two at least, who are considering polychrome in commercial facades. One an architect, another an artist who is engaged in manufacturing. If these men take up this work the world will say, "How great is polychrome in building." There will be failures in following, but there will always be the lead to point to. Whatever is done in color architecture must be done in clay. So much for the clayworker.

#### THE PASSING OF JOSEPH JOINER.

Different people may see the same man from different points of view. Different people may be justified in their various understandings. Joseph Joiner was the terra cotta pioneer in this country. Mr. Taylor, who pays tribute to his memory on another page, undoubtedly knew him intimately in his early experience in this country. His later life in Indianapolis, when he had reached the period of his greatest productiveness, the time when he felt settled in his experience, when his children were maturing and settling into the activities of life, this was a time when the real mature man showed himself. It is not always that a man starts out as well as did Mr. Joiner, and ends as well as he. It is worth while to have lived the life that he lived in the building trade. A man who has made good terra cotta has had part of his reward on this earth. It is said that virtue is its own reward. Think of the man who has helped to advance the standard of excellence in a building trade as has he. Think of the reward of his life as compared with that in a counting room, where one does nothing but judge of credits. Bear prices on the one side and bull them on



the other, who has done nothing but make money. Think of the lives of such men and their results, and compare them with the life of a man like Mr. Joiner. His personal character in the factory, at home and among his friends was of just as high a standard as the material products of his life.

### CLAY, ART AND ARCHITECTURE.

One who had traveled abroad studying pottery, one who had worked in the prominent schools of the old world returns to his native country and says that the clays of America are no more suitable for artistic expression than is the mind of the American at the present time suited to artistic impressions. What nonsense. No country is richer in clay and no mind more impressionable than the American. Wherever the American artist, as at the Rookwood pottery and others of equal merit, treated the American material in an individual or natural way, or wherever the American and the manufacturer of terra cotta has expressed himself normally, as has been done in all of our terra cotta manufacturies, there has been pronounced success. The American manufacturer of terra cotta who stands at the head of his profession in this country may feel assured that he stands at the head of the terra cotta profession of the world. In no country does the artist and the architect or the artist and the sculptor and modeller stand closer to the product in terra cotta than here. No embarrassment is felt on account of the character of the material. But when it comes to the exact imitation of foreign products it is to be hoped that we are lacking. The work of the artist is not in resuscitation. The artist is not a grave robber. He is a creator. He works with the material at hand. He works in his own time. He works with the thought of his own time. The world does not learn from the material and substance of Greek architecture. It does not learn from what they actually did. If it is taught at all, if it derives anything from it, it is from the spirit and logic which produced it.

### FOOD FOR THOUGHT.

Variety is the spice of trade literature. For this reason we have always striven to give our readers a varied bill of fare, mixing with the mass of trade wisdom a modicum of wit, with now and then a bit of nonsense to leaven the meal and aid digestion.

No trade journal in any field gives its readers more especially prepared, solid fare—food for thought—than does the Clay-Worker. Every field of interest to the clayworker is explored by our correspondents, and the "fruits of the chase" served in an appetizing way. Not alone here at home is this done, but around the globe in distant lands and from foreign tongues, we, for years past, have gathered clayworking lore and spread it before our readers.

In this issue they will find an interesting article on "Clay-working in Greece," by an able special correspondent who spent the summer in that historic land. Another, "Plastic Brickmaking in England," by a resident correspondent of the mother country, and we have for a subsequent issue a description of "The Clay Industries of the Eastern Countries of Europe" by a practical brickmaker, who is thoroughly acquainted with the methods of work in that part of the world. We at this time have a special representative on the continent, who will in good time contribute a series of illustrated articles on the clayworkers and clayworks of that country, and equally interesting contributions from other lands across the sea will follow, all in good season.

This sort of fare is not new to our readers. We have been serving it for years, and expect to continue to do so, and that, too, without the accompaniment of a brass band or any un-

seemly trumpeting. The sending of a representative abroad is not an extraordinary bit of enterprise for a live trade journal. Nor, indeed, is it of marked importance, for American manufacturers have not much to learn from their fellow-craftsmen abroad. Indeed, the shoe is on the other foot, so far as mechanical methods and aids are concerned, particularly in brick-making. Our brick machinery is far ahead of that used in the most advanced European countries. Because of this, American machinery has been introduced in England, Germany, France, Russia, the Netherlands, and even South Africa. In most instances, these sales have been a direct result of the Clay-Worker's influence and circulation abroad, as our advertisers will testify.

The latter, however, rationally consider these foreign orders but a side dish to their trade table—a little seasoning, as it were, a relish, pleasant to the taste, but a small part of the substantial food which a healthy body, whether individual or corporate, requires. Domestic, not foreign, meats form their chief diet. So we gather these foreign "spices" for our table, not so much in the hope of instructing, but rather to interest and amuse our readers, and they relish it.

P. S. We neglected to mention that our staff artist, Chas. Lederer, of Chicago, has but recently returned from a trip abroad, and will in the near future tell our readers all about it. Mr. Lederer is not only a famous sketch artist and a brilliant writer, but an accomplished linguist. His next contribution will be entitled "The Story of a Tin Watch or the Experiences of Solomon Skinfield, the Cheap Man." It will be both humorous and pathetic, and illustrated on zinc etchings, regardless of cost.

N. B. We wish also to add that the Clay-Worker is cheap at \$2.00 a year, but is not a cheap paper. We have never had to bribe brickmakers to read it by the gift of tin watches. The clayworkers to whom we cater are not "cheap men," do not subscribe to trade journals in order to get chromos or pinch-beck Jewelry, but take the Clay-Worker because they want a good paper—AND THEY GET IT. Now is the time to subscribe.

### WHAT WE LEARN FROM OTHER TRADES.

It is said that reforms come from outside the professions. That is, reforms of the law do not come from the lawyers. Reforms in medical work have not come from the doctors, but rather from some acute and independent mind from the outside. We are inclined to think that things within our own circle are nearly right. A friend tells of his experience with a clay sifter used in sifting clay for a high grade of work. He said that the machines in use had never proven highly satisfactory, but that a miller friend of his, in looking over his troubles, had recommended a bran duster, with the parts somewhat increased in strength. The result was a very low-priced machine of great capacity and efficiency. From a varnish factory came another suggestion. He wished to absolutely and uniformly pulverize the dry clay. From the varnish factory he borrowed the idea of using a cylinder in which clean, washed gravel was placed, which was charged with lump varnish in the instance of the varnish maker and with clay in the instance of the potter. The cylinder was revolved until every particle of the dry clay was absolutely pulverized. After the gravel was separated from the clay by a screen, the result was found more satisfactory than by any similar device hitherto employed. Now, in turn, this pulverizing device is to be used in grinding middlings in a flour mill.

### A GOOD PLACE TO "GROW UP."

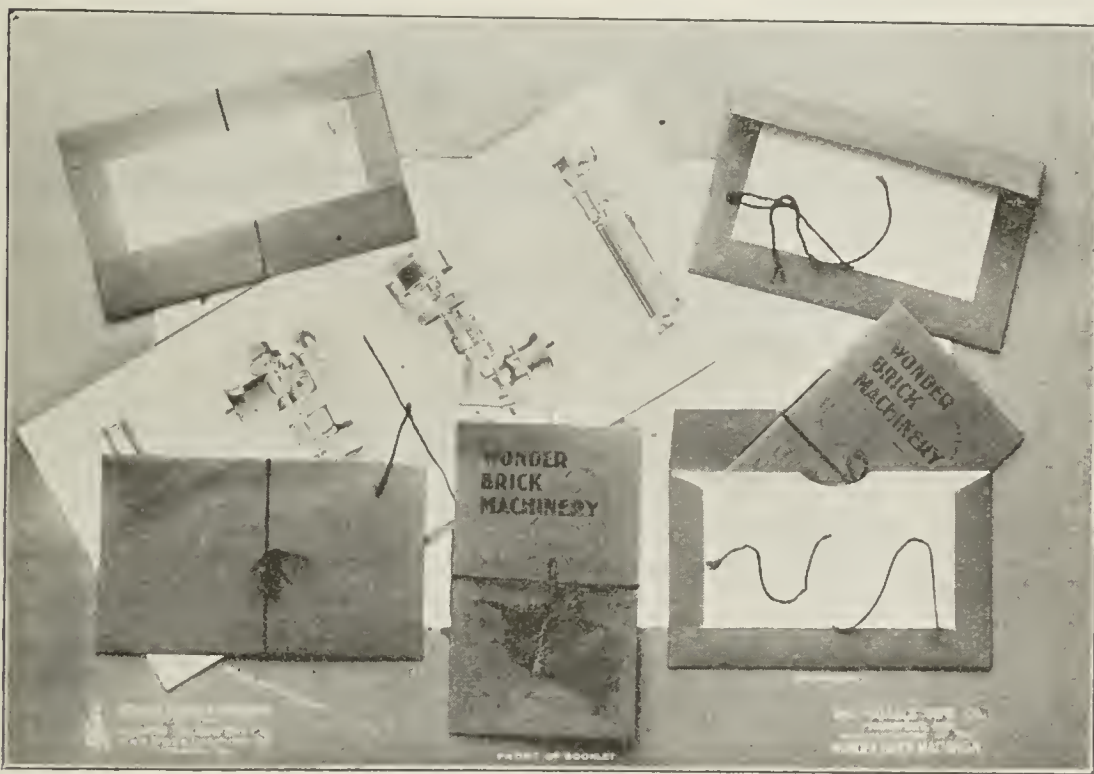
Among other interesting ads. in the "Wanted, For Sale," etc., columns is one of the Hawarden (Ia.) Brick and Tile Factory, which is offered on terms that ought to tempt some practical clayworker looking for a desirable place to locate and grow up. Hawarden is at the junction of the C., M. & St. P. and the C. & N. W. railroads, and therefore has fine shipping facilities. For other details see ad.



## EXIT THE POTTER'S WHEEL.

**A**LL THROUGH the countless centuries the potter's wheel has existed, and Nature seems to have set herself the task of protecting this most primitive of handicrafts. It is easy enough, of course, to stamp hollow ware out of clay, but the difficulty of freeing it from the mould has seemed unsurmountable; at least, all attempts failed until Mr. William West, a Yorkshireman, turned his attention to the thing and showed that it was quite practicable after all. He has been doing it with the utmost success in the case of jars of every description, basins, and flower pots, and why should not all other hollow ware follow and the potter's wheel go to the museum? It is with flower-pots we have to do at present. The output in Great Britain of these gardening necessities is 500,000,000 per annum, so that the possibilities of a monopoly in their manufacture is a thing to gloat over. Still there does not seem any reason why West's Patent Pottery and Machine Company, Limited, should not bring about a complete revolution in their manufacture, for it seems impossible for the potter's wheel to compete with their machines.

A large party of journalists traveled down to the works of the company at Walthamstow on Monday last, and the Press has never had the privilege of assisting at a more interesting or more successful demonstration. The first noticeable thing is that the works are surrounded by their own raw material and that it is asserted that even poor clay makes an excellent machine-made flower-pot. The clay after digging is dried in the open and then ground to powder in an ordinary pug mill. It is then fed from a hopper in a mould and pressed into "clots," that is to say, slightly hollowed out discs just containing sufficient clay to make a particular size of flower-pot.



Each machine, by the bye, has changeable plungers and moulds, so that with a small plant all sizes of pots can be made. The clot is ejected automatically and travels towards the operator in charge of the next machine.

He feeds them one by one into the mould of this machine, which stamps out a perfectly shaped flower pot and delivers it into the workman's hands with a twisting upward movement of the bottom plate of the mould. This movement expels the air and makes the pot firm and smooth. The plunger is carried in a sleeve, which is simply suspended by hook bolts from the solid part of the machine, from which it is kept up to its work by springs. At the end of the stroke these springs take up the pressure, and if there is any air or superfluous clay inside the pot, it passes through an air space round the top of the plunger. A tappet underneath the machine turns the

spindle of the ejector after each stroke, so as to finish off the the lower end, and then, by a pneumatic arrangement, the pot is at first brought up with a jerk, and afterwards more slowly, so that there may be no risk of its being thrown out or injured. When one machine does the two operations, the clay is fed into a hopper, underneath which a revolving cylinder takes a charge of clay, which falls down a shoot into the mould. The third, or trimming machine, takes off the rough edge of the rim, and at the same time bores the hole at the bottom and stamps a name on the pot. We hope shortly to give some illustrations and further details of this machinery.

The machine is 18 times as quick as the potter at his wheel and makes a much better article. It seems a work of super-erogation to stack the pots in a drying shed, for they are firm, hard, and devoid of any superfluous moisture, very different to the soaking, flabby articles turned off the wheel. We have seen a man of 12 stone stand on the bottom of a freshly-made pot without breaking it. Of course it follows that less fuel is expended in kilning, and the absence of air bubbles ensures a stronger pot with greater wearing powers. The pots are perfectly smooth and true to shape, an important thing from the packer's point of view. There is not the slightest doubt that this West invention is a splendid thing, and, with Colonel Sellers, we can say "there is millions in it."—Invention, London.

The foregoing no doubt refers to a flower pot machine similar to the one illustrated on page 400, which has been used in this country for nearly twenty years. It is a good machine, but no novelty on this side of the briny deep, as it seems to be with our cousins, who, if they will "wake up" and look about, will find that American manufacturers are turning out many other novel and very desirable clayworking mechanisms that they might adopt with profit.—Editor.

## THE ART PRESERVATIVE.

No art has made more progress during the past decade than that of the printer. Supplemented by the new photo process of engraving the modern art preservative is an art indeed and no department of the printing business has benefited more by modern methods than that devoted to trade or industrial interests. Frequently there comes to our desk for notice, trade catalogues and pamphlets that are really works of art. One of the best specimens we have seen comes from the Wallace Mfg. Co., Frankfort, Ind. It is odd in conception, being an eight page folder stitched in the center to a dark green cover lettered in red and black. This comes enclosed in a special envelope made of the same material. One side being partially formed of white bristol for the address. The package is prettily tied

with dark red silk cord. The accompanying illustration will give an idea of the combination but it must be seen to be appreciated. It can be had for the asking.

## AN INCENTIVE TO GREATER EFFORT.

A man who met with all sorts of reverses when he first went into business says that if everything had gone his way he does not believe he would have made a success. His disappointments seemed to spur him on to more active effort—he worked harder—studied his business more systematically, and as a result was better fitted to father the immense interests which he now controls. Discouragement to him has always been an incentive to greater effort.—Ad. Sense.

Read the "Wanted, For Sale," etc. ads on pages 394, 395 and 396









Ontario Paving Brick Co., Toronto, Canada, use two.  
McAvoy Vitrified Brick Co., Perkiomen Junction, Pa., use one.  
American Clay M'f'g Co., Pittsburgh, Pa., use one.

Is

Clarksburg High Grade Shale Brick Co., Clarksburg, W. Va., use one.  
Reese, Hammond & Co., Bolivar, Pa., use two.  
Welch, Gloninger & Co., Vanport, Pa., use one.

Certainly

Kensington Brick Co., Pittsburgh, Pa., use two.  
Edenburg Brick Co., Edenburg, Pa., use one.  
J. W. Minor, Thomas, Ala., use one.

The

Excelsior Brick Co., Montgomery, Ala., use one.  
Mack M'f'g Co., New Cumberland, W. Va., use two.  
H. Duval & Co., Kingston, Jamaica, use two.

Only

Queen City Brick and Tile Co., Cumberland, Md., use one.  
Douglass-Whistler Brick Co., Vanport Pa., use one.  
W. R. Meredith & Bro., Punxsutawney, Pa., use one.

Re-Press

TWENTY OF THESE POPULAR  
RE-PRESSES SOLD AND  
PLACED IN SUCCESSFUL OP-  
ERATION DURING THAT TIME.

C.W. RAYMOND & CO.  
DAYTON, OHIO.



## THE NAME OR MAN.

## Attention to Detail the Key to Success in Modern Brickmaking.



HAVERSTRAW HAS THE name of producing the best common brick in the east. As a result, many brick manufacturers, to judge by the expressions heard, and that often appear in print, think that if they can get a man from that place to take charge of their yard, success is certain. Many have been engaged on the strength of some recommendation given, when it should have been withheld, and their failures have taken many dollars from the pockets of the employer who fancied himself in luck to get "an experienced man from Haverstraw." The term don't mean as much nowadays as it used to.

## —Really Good Men.—

Are scarce even in Haverstraw. By this I mean men who are competent and will give satisfaction in any capacity in which they may be employed. He has to do his work and do it well and as years pass new bosses enter the trade and, as a rule, they are men who have worked on the yards and know what a hand should do and do it well. Of a necessity the men must develop their best ability to keep up, especially those who live in the town. The young man who is ambitious to have charge of a yard some time in the future may be singled out by the close attention to details. Such a man will be far in advance of another who has had just the same chance. Watch him and you will find that he never misses an opportunity to set brick. He will ask the setter to let him try to set or get in the kiln and set in behind the regular setter. If he does his work well, he will have the opportunity given him as often as he may wish to get in the kiln, as the stent system largely prevails. There are three wheelers to a setter and the second wheeler will be waiting for the others to get his barrow unloaded, the few he sets will help the men to get through so much earlier. The boss and foreman have watched him with the result that from some cause one of the regular setters is off, the foreman puts him in the kiln and he is kept there. He is around the kiln half the night watching closely what is being done and is soon known as a handy man around the kiln. Luck favors him, the second hand may leave, the foreman thinks from what he knows of the man that he can trust him, and he is made the second hand. Most men at this point do not strive to get the next step, but are content to wait, till by chance they may get a change. The really good man, the foreman of the future, makes it his business to do all he can to help along. There are always some on the outlook as to a man's ability around the yard or some one hears of a chance to go outside and take charge of a yard. His boss and foreman will tell him to go, as they know he is competent, and have no fear but that he will be a success. He takes to his new employer the same spirit that he worked on the home yard, to do his best, and thereby prove that he is a good man in his line.

## —Another Class of Men.—

Found on all yards, at Haverstraw, as well as elsewhere, are those who have worked side by side with the one just quoted. He will try his best to see how he can get along with just what he is called to do, and no more, never making any effort to see if he can learn more of the advanced portions of it, by offering to help and get some insight, so that he would be in a position to step into any opening which might occur. He will drift along and be years before he is asked by some foreman, who knows him, why he does not learn to set brick, his reply will be, "I never had the chance." One must make the chance by using some of his own time learning the first part. No, he would rather get through and go home. After the suggestion he may try to get a chance and get a job away from home through an advertisement or some other means. Now the "snap" is his and he will make the best of it. He thinks that because the yard is, we will say, in the country somewhere, he will take it easy, as they do not know anything about making brick. The employer hired him thinking because he came from Haverstraw he would conduct his yard as he was called upon to do at that place. There he had to do his best to keep up with the others, or get out, but now he is going to take it easy and proceeds to do so, not turning out the number of brick per man that he knows is right, and when he burns his kiln he does take it easy with a vengeance as the kiln shows when opened. The boss is dissatisfied and asks him what is the matter. Of course, that ever ready excuse is given "the stuff is strange to me," the next kiln will be all right. The boss accepts that excuse in good faith and waits with all patience till the next kiln is burned and opened, only to find that it is worse than the first. Ruin stares the boss in the face if he

keeps on, and he concludes to discharge him. There are many such cases, not that all the men come from Haverstraw.

## —The No-Principal Man—

Or the one who does not seem to care what the result may be to himself or to those who recommend him, is one of the evils which seem to attend those who follow brickmaking. Parties who furnished material for a brick yard outfit received an order for a one machine yard and was also requested to recommend some one competent to oversee the building of the yard and running it after it was ready. They recommended one who was well fitted to do all that was required of him, no doubt that some of your readers would recognize the name if I should give it, he was considered one of the best brick makers in the town. The proprietor authorized him to employ some men which he was fast to do, three men and a boy of sixteen to dump. The rate of wages he agreed to pay was above the ruling rate. When they arrived at the place where the yard was to be built, preparations were made, but the man in charge was in no hurry, as he was under wages, and after they began to build it seemed his whole object was to hold back the work. After a time, and a long time at that, molding was begun, but the methods used by him to make a soft thing of the place was outrageous. The owners finally began to see that things were not as they should be and called on the parties who recommended him. It was a complete surprise to them and they had a difficult task to square themselves. When the first kiln of five arches was burned, there were two around it and at night the boy was up on the foreman's watch, if it could be called a watch, for he picked out the best place he could find to lay down and sleep. The boy filled the arches the best he could, and would call the foreman now and then, only to be told to keep her filled up. The other parties who were on the rest of the night were working to get him out, so that any one can conclude what kind of a kiln it was when burned. It was opened as soon as possible and he was discharged at once. The second hand was then put in charge, made a kiln, and when I say that he had never burned a kiln, it is enough to convince the practical reader that the second state was worse than the first. Then the whole crowd was paid off. There should be some way to bring such parties to book. A suit was threatened by the owners against those who furnished the recommendations, but they succeeded in convincing the other side that what they did had been in good faith. It was a most unprincipled piece of work, and, as if a judgment upon him, the foreman never had anything to do with a brick yard from that time till his death but it was a failure, and finally he was so reduced that he had to be helped by his friends. It is not an isolated case, there are others in the same line.

## —The Coming Man—

May or may not be any better than the present foreman. Certainly he will have been through a good school as the present yard is conducted. Possibly he may not become gray headed as soon as the present generation, as smaller returns may be looked for, and he will not have to study new means to get more work out of the men, and then sell the brick for a lower figure.

A JERSEYITE OBSERVER.

## MODERN VS. ANTIQUATED METHODS.

Manila was captured by the British in 1762, but it required thirteen ships and nearly 7,000 men, 1,000 of whom were lost in the assault upon the fortifications, to accomplish what Admiral Dewey did with a smaller numerical force and with no loss save that of the ammunition used. That illustrates the difference between old and new naval methods and machinery. We take it that the methods of making brick in the Philippines would share about the same fate in competition with American machinery and methods.

## CLAYWORKERS' CONVENTIONS.

The Illinois Clayworkers' Association will meet at Peoria, January 17th and 18th.

The National Brick Manufacturers' Association will meet at Columbus, Ohio, February 7th to 10th.

The Iowa and Nebraska Brick and Tile Associations will meet at Sioux City, Iowa, March 1st and 2nd.

## THANKSGIVING DAY RATES.

Agents of the C., H. & D. will sell tickets for the above occasion at the rate of one and one-third fare for the round trip to all points within a radius of 150 miles.

Tickets good going on November 24; good to return including November 25.



# Hey There,— New Englanders!!

A Neighbor of yours struck a Good Thing. Note Points Mentioned.

—OFFICE OF—

## Taunton Brick Company,

151 Winter Street.

CHARLES F. JOHNSON, TREASURER.

Taunton, Mass., October 17, 1898.

The Wellington Machine Co.,  
Wellington, Ohio.

Gentlemen:--The two "Monarch" machines we purchased of you last spring have fully met our expectations, and have done all, or more, than you claimed for them.

We take the clay directly from the bank to the machine, making from 45,000 to 48,000 brick per day of ten hours on each machine. We could safely speed much higher if we wished to do so.

We work the clay very stiff, getting good square brick with well defined corners. All who have seen them in operation admit that we have the right machine. The cost for repairs has not been enough to mention, and they are now in as good condition as when first put in operation. They are very light running requiring less than 20 horse-power at our present speed. Any one putting in new machinery will make no mistake by selecting a "Monarch."

Wishing you continued success, we remain,  
Yours truly,

TAUNTON BRICK CO.

They did not happen to mention **all** of the good points, which are fully explained in our circular. Send for one.

**Remember.** We also build

### The "Iron Quaker,"

The best and most generally used upright soft-mud machine, both horse and steam-power. Send for list of 500 users, and go and see the nearest one to you.

We make ALL supplies.

Have you yet tried one of our

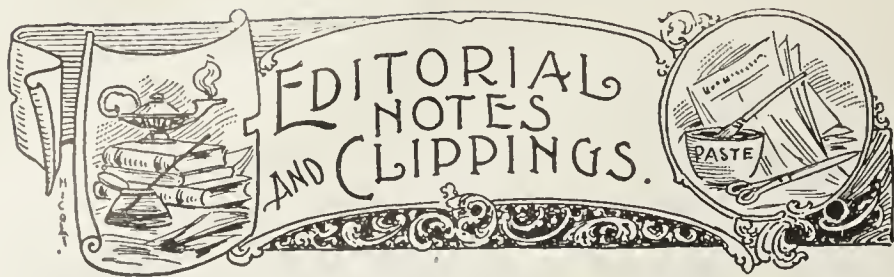
### Ball-Bearing Brick Barrows?

It's a money saver. Order a sample one on trial and if you don't like it, send it back.

## The Wellington Machine Company,

WELLINGTON,  
—OHIO.





Alvin Etheridge will establish a brick plant at Johnston, S. C.

Henry Stanley will start a brickyard at Berkshire, Vt., in the very near future.

The Muskegon Brick Co. has been incorporated at Muskegon, Mich., for the manufacture of brick.

Andrew Newton, of Halfmoon, N. Y., will engage in the manufacture of brick at Danbury, Conn.

The Rome (Ga.) Brick Co. are running full time. They are at present filling an order calling for 2,500,000 brick.

L. H. Brayman has sold out his interest in the Capron Brick and Tile Co. at Capron, Ill., to the other stockholders.

H. A. Thompson & Co. have purchased the Salineville (Ohio) Clay Co.'s plant and will at once put same in operation.

C. H. Croninger is erecting a large plant at Hartford City, Ind., for the manufacture of sewer pipe and drain tile.

The Hartford division of the Central New England Brick Exchange at Hartford, Conn., has been dissolved by order of court.

A small loss was sustained by the Milwaukee (Wis.) Brick Co. by a fire in their dryer recently. The loss will not exceed \$200.

A. B. Kesler, of Keslerville, will start a brickyard at Hillside, Ga. He expects to use steam in the manufacture of his brick.

Henry Mayer, 1213 State street, Erie, Pa., writes that he would like to correspond with manufacturers of vitrified clay conduits.

Lawrence Krupp, a well-known retired brick contractor and manufacturer of Louisville, Ky., died at his home in that city the first inst.

The brickyard of Kilkenny & Davis, at Utica, N. Y., was almost totally destroyed by fire November 4. The loss is covered by insurance.

Willis & Brown, of Ty Ty, Ga. write that they would like a copy of the Clay-Worker, as they desire to get information in regard to brick machinery.

M. Kilroy, a brick manufacturer of Ingram, Ill., contemplates locating a brick plant at Geneva, Ill. There is a splendid opening there for an enterprise.

J. H. Haynes & Co., brick and tile manufacturers at Brooks, Ind., are putting in a new brick dryer. This will enable them to keep their plant running all winter.

William Summerville, proprietor of a large brick and terra cotta plant at Washington, D. C., died at his home in Summer-ville, Pa., recently, of Bright's disease.

Wm. Rodgers, a foreman at Reed & Ettla's brick works, at Clearfield, Pa., was caught between two empty freight cars used for hauling clay and injured internally.

J. V. Rose, proprietor of the fire brick works at Sharon, Pa., has purchased the Eclipse Paving Brick plant at Doughton, Ohio. He will move the plant to Sharon, Pa.

Thos Dinan contemplates making some extensive improvements at his brick plant at Saugerties, N. Y. He expects to put in a great deal of new machinery and appliances.

The Gaffney Brick Co. are enlarging and improving their brick plant at Winchester, Ky., putting in new machinery. They expect to have a capacity of 1,500,000 brick per month.

A new company has been formed to operate the brick plants at Montowese, Conn., now owned by F. W. Brocksleper. Wm. Spitler, of New Haven, is interested in the plant, which will have a daily capacity of 40,000.

The many friends of Frank W. Melcher will be pleased to learn that he is slowly recovering his health. He has retired from the management of the Marion Brick Works and taken up permanent residence near his old home in Pennsylvania. Frank W. Butterworth, who has been associated with Mr.

Melcher in the management of the company for a number of years, has succeeded to the office of general manager. We know his clayworker friends will join with us in wishing him all the success he deserves.

Harry Leyrer, a brick manufacturer of Monterey, Mexico, died recently in that city of yellow fever. Mr. Leyrer was formerly of Allentown, Pa., but had been in the brick business at Monterey for the last six years.

Mrs. Auguste Kreuder, widow of the late Charles Kreuder, died, October 20, at Nyack, N. Y. Since the death of her husband, twenty years ago, Mrs. Kreuder has successfully managed the brick plant at Haverstraw.

C. Fleming, an employe of the Richardson Fire Brick Co., at Athens, Tex., was caught in some of the machinery and crushed to death, dying almost instantly. A colored laborer was painfully injured at the same time.

F. Schrader, proprietor of the Jonesboro (Ind.) Brick Co., reports a good trade. They have recently captured enough orders to keep them running all winter. Among recent large orders is one for sewer brick for Indianapolis.

Harry L. Dashields, member of the firm of W. W. Dashields & Son, brick manufacturers, died at his home in Baltimore, Md., November 2. Mr. Dashields was one of the young business men of Baltimore, being but 35 years old.

The plant of the Butte (Mont.) Tile Works was damaged to the extent of \$400 by fire recently. The fire started from an over-heated stove in the furnace room, which set fire to the wood work near by. The loss is fully covered by insurance.

During a high wind which prevailed at Villisca, Iowa, last month, one of the walls of a large kiln at the Villisca Brick and Tile Works was blown in, injuring one of the employes, Asa Beard, killing two horses and completely wrecking two wagons.

An accident occurred at the brick plant of Adam Pontz, at Lancaster, Pa., which resulted in the loss of 20,000 green brick. The drying racks on which the bricks were placed gave way, with the above result. Bricks and racks were utterly demolished.

The plant of the Huntington (W. Va.) Paving and Building Brick Co. has been purchased by V. J. Holsche and others. The plant has been idle two years, but will now be put in operation at once. One hundred men will be employed in the manufacture of clay shingles.

E. W. Shuey, of the Shuey Brick Co., Toledo Ohio, has purchased the entire plant, good will and business of the Jameson Brick Co. Mr. Shuey will make a number of improvements in the plant, with a view of increasing the capacity. The purchase price of the plant is said to have been \$10,000.

The Jacksonville Brick Co. and the East Coast Brick Co. of Jacksonville, Fla., have formed an exchange through which all of their sales will be made. Jno. G. Christopher has charge of the exchange. Brick are now selling at \$8.50 per thousand, and they hope to keep the price up to that figure permanently.

The house and barn of Albert Lonyo, a brick manufacturer of Detroit, Mich., were burned to the ground November 6. Twelve large draft horses used on the brickyard were burned, as well as all the carriages, harness, etc., Mr. Lonyo places his loss on house and barn at \$15,000. He carried about \$5,000 insurance.

C. E. Magers, of New London, Iowa, in a recent letter inclosing subscription, says business with him the past season has been very good, especially with tile. He says he has just put in one of the Decatur Leader brick machines, and is now putting in one of the American Blower Co.'s dryers, and then expects to run all winter.

M. S. Marquis, the brick manufacturer of Newcastle, Pa., will erect another and a larger brick plant near his old plant. The new establishment will have a daily capacity of 75,000, and will be equipped with the latest brickmaking machinery. Ground will be broken at once, and Mr. Marquis expects to have the new plant in operation before spring.

Louis LaBahn, of Evanston, Ill., son of F. LaBahn, of the Weber-LaBahn Brick Co., and a member of the company himself, was drowned recently while duck hunting. He with two other men, one of whom, Wm. Schaffer, was an employe of the brick company, went out in a light boat when the lake was rough, and were unable to manage the boat, which was cap-

CONTINUED ON PAGE 392.



Something New.  
Something Good.

OWING TO DELAYS on the part  
of the Engravers we are unable to  
illustrate our new

# Imperial Machine

On this page as we expected to do, so we  
must ask the indulgence of the trade for  
another month, when we will show a **new**  
**Combined**

## Brick and Tile Machine

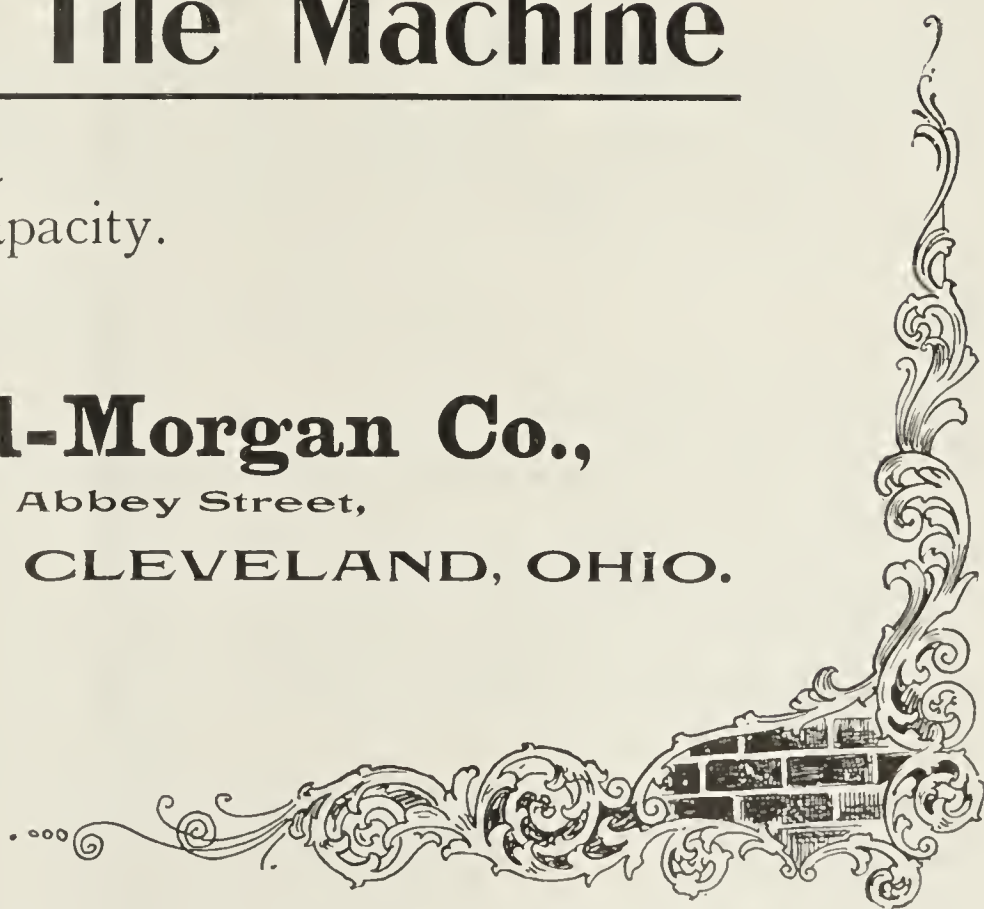
Of remarkable Capacity.

**The Battefeld-Morgan Co.,**

226-236 Abbey Street,

CLEVELAND, OHIO.

DON'T FAIL TO WRITE FOR DESCRIPTIVE CIRCULAR AND GET OUR PRICES.





The Des Moines Brick Manufacturing Co.,

—MANUFACTURERS OF—

# Vitrified Paving Brick,

DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities

Estimates on Brick pavements cheerfully given.

The Clinton Paving and  
Building Brick Company,

Manufacturers of the Highest Quality of

## Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: Clinton, Ind.

## INDIANA PAVING BLOCK,

The Standard Shale Block for  
Street Paving.

Manufactured at Brazil, Ind., by the

Indiana Bermudez Asphalt Co.,

Main Office, 25 and 26 Baldwin Block,  
INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.

W. C. SIBLEY, PRES.

J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

## Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,  
COALDALE, ALA.  
TELEGRAPH OFFICE,  
WARRIOR, ALA.

BRANCH OFFICES,  
BIRMINGHAM, ALA.,  
MONTGOMERY, ALA.,  
NEW ORLEANS, LA.

## Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of \$1.00.

T. A. RANDALL & CO.,  
Publishers,

INDIANAPOLIS, IND., U. S. A.



T. B. McAVOY,  
President.

FRANK B. McAVOY,  
Secretary and Treasurer.

# McAvoy Vitrified Brick Company,

OF Philadelphia, Penn.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee. Correspondence solicited.

OFFICE:  
1345 Arch St., Philadelphia.

WORKS:  
Perkiomen Junction, Penn.

# The Purington Paving Brick Co., of Galesburg, Illinois,

**H**AS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business. Correspondence respectfully solicited.



## EDITORIAL NOTES AND CLIPPINGS.—Continued.

sized and all three men were drowned. Mr. LaBahn was but 22 years old, and was superintendent of the brick plant. His father says he was a fine athlete and an excellent swimmer, but it is supposed he was weighted down with his heavy canvas shooting coat, the pockets of which were filled with loaded shells. Mr. Schaffer was 31 years old, and leaves a wife and two children.

Battenfeld-Morgan Co., of Cleveland, O., write that they are very busy, having sold one of their new "Imperial" machines to each of the following parties: N. Crawford, Dothan, Ala.; J. W. McMillan, Milledgeville, Ga.; Victor Cushwa & Sons, Williamsport, Md.; Frank Petter, Paducah, Ky.; Geo. W. Emery, Seaford, Del., and Peter Harris, Macon, Ga.

A serious fire occurred at the plant of The Baton Rouge (La.) Brick Co., on the 5th inst. The entire plant, including buildings, machinery and dryers. The loss is estimated at \$15,000, on which there is \$10,000 insurance. The plant has been in operation for a quarter of a century and has never experienced a loss by fire in all that time. The plant will be rebuilt at once.

Geo. B. Canoles and Chas. Reed, of Baltimore, have started to Porto Rico with the intention of embarking in the brick manufacturing business. The men are both energetic and have been employed at the brickyard of Druid Brick Co., and while their capital is limited they have plenty of pluck and muscle, and the clayworker joins with their many friends in wishing them success.

Ben H. Richards, of Edwardsville, Ill., writes that he has had a fairly busy season, having turned out 2,000,000 brick made on a three-mold Andrus machine. He has two Wingard kilns and one old-style clamp or ground-hog kiln, as he calls it. He says he turns out an excellent quality of building brick, the prices for which range from \$4.50 for salmon to \$7 for face brick.

J. A. Ballantyne and H. Conn, of Ottawa, Ont., have purchased land near that place on which they will erect a brick plant. They expect to equip the plant with modern machinery and to have a model plant in every particular. Mr. Thomas Gammon, who has been superintendent of the Graham plant for many years, will have charge of the manufacturing department.

The Marion Brick Co., of Indianapolis, have placed an order with C. and A. Potts & Co. for one of their all-iron horizontal stock brick machines and mold sander for their works at Montezuma, Ind. This makes the fifth machine furnished by Potts & Co. to the Marion Brick Works, which certainly speaks well for Pott's machine. The machine just purchased will be used for both building and fire brick.

John Karmonowski, an employe of the Staten Island (N. Y.) Clay Works, had his clothing caught in an immense revolving shaft, and before anything could be done to save him he was drawn into the heart of the machinery and was so badly crushed when taken out that he died a few hours afterward. He was from Hungary, having only been over here about six months, and was in a measure ignorant of the machinery around which he worked.

## ST. LOUIS NOTES.

THERE IS VERY little to report. The building permits issued in October will not bear mentioning for a city of this size and in a month which is usually the finest of the year. It may have been the weather. October, 1898, has not been a pleasant month. A few fine days in the latter part of the month and the first of November enabled the brick yards to harvest a great deal of clay, and the shortage reported was only a bugaboo, as subsequent investigation has proven that all the yards are well supplied. The price of common brick has advanced 25 cents per M, merchantable rules at \$4.25, strictly hard at \$5.00 to \$5.50, and ordinary at anything between.

An effort was made by Mr. L. J. Howard, first vice president of the N. B. M. A., to get an opinion of the clay interests of St. Louis on the subject of holding the next convention in this city. The result showed that out of 36, 11 were in favor, 11 opposed, and 14 not enough interested or too busy to respond. Before the final result was obtained information reached here that Columbus had secured the prize and the matter was dropped. There is no doubt that the year 1900 will welcome the

brotherhood of brickmakers to a city which can show them more good brick and brick work to the acre than any other city in the United States.

It is reasonable to suppose that if a little missionary work was done among our people and the benefits outlined to them of the coming in contact and rubbing against the broad-gauged men who attend the N. B. M. A. they would come forward manfully with their time and money and extend a hospitality of which St. Louis is proud.

It is reported that the Ross-Keller Brick Machine Co. has sold to the U. S. Government for Ft. Leavenworth, Kans., one of their six-mold presses, and that after the most critical examination by experts of all the brick machines in the market This certainly will be a card for the Ross-Keller Co.

After all the talk of dull times and low prices prevailing this year on brick, one yard has made a 10 per cent. dividend on \$60,000 and put in \$14,000 in improvements. Another brick-maker of the city, running a yard in the west end, is credited with having made between \$5,000 and \$6,000 in 1898. Prices at the beginning of the year were \$5.25 to \$6.00, and it would seem that what money was made must have been made at that time, or else they know how to make brick cheaper than ever before. The expense of yards referred to are merely nominal, but it proves that a small yard with minimum expense is better than a large capacity run on half time.

The new office building at 6th and Olive streets will be a light-tinted brick and terra cotta. The Hydraulic Press Brick Co. will furnish the face brick, Winkle Terra Cotta Co. the terra cotta and the College Hill Press Brick Co. the common brick.

There is talk of more heavy buildings in the Cupples Warehouse district being planned for immediate erection, and a change being made from slow combustion to fire-proof plan. These buildings will use less common and more hollow brick. If they can lighten up the walls a large amount of money can be saved in the foundations, which now have to be piled. The new Jackson school was let to the Lenz Helm Building Co., Evens & Howard securing the contract for the ornamental terra cotta, which amounted to over one hundred and forty tons.

St. Louis, 11-9-98.

A. SAINT.

## THE NEW YORK MARKET.

WE STILL HEAR the whistles in the morning calling the men to work on the brick yards though it is the last of October, and there is a fair prospect of continuing in November, and nothing will stop them except an exceedingly long rain or continued frosty weather. It is a sound that has not been heard so late in the season for many years in this section.

The time to stop moulding one would say was not later than October 15th. The prospects of having good weather to finish up with is certainly better at that date than later. The manufacturers will say "circumstances control me." What are they? One may be a green kiln with three or four arches in it, and he wants to make it not less than ten in size. Why he did not start it earlier so that he would have it in shape to be of use number of arches is locked in his own mind, but the simple solution is, that as the weather has been fairly good he will take the chances, which he does and it costs him more to make them.

—Labor—

has been very scarce this fall and more especially since the yards at Haverstraw started up. On some of the yards they have been unable to mould when the weather would permit. Probably the market has felt that factor, as it has been impossible to make and load. It took over a week to load a barge.

—Market—

The offerings from day to day have been freely taken up so that the surplus at the end of the week has been small. The prices have ruled in favor of the manufacturer, so far no reaction has appeared of any moment, but, when all yards stop making and they begin to ship them there may be a slight reaction, if from present indications the rates should slump to a marked extent no doubt some would not send, but wait for the spring market. As all look for good rates up to new brick at least. Possibly some factor through the coming elections may have a retarding influence on building operations, to such an extent that the prices looked for will not be realized. Haverstraw, \$5.00½, \$5.00¾ and \$6.00; Newburgh Bay, \$5.50, \$5.75 and \$6.00; Up River, \$5.50 and \$5.75; Hackensack, \$5.50 and \$5.00½; Pale, \$3.75 and \$4.00.

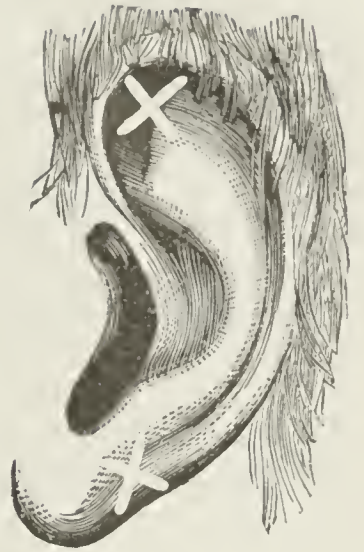
A. N. OLDTIMER.

Hackensack, N. J., November 1.

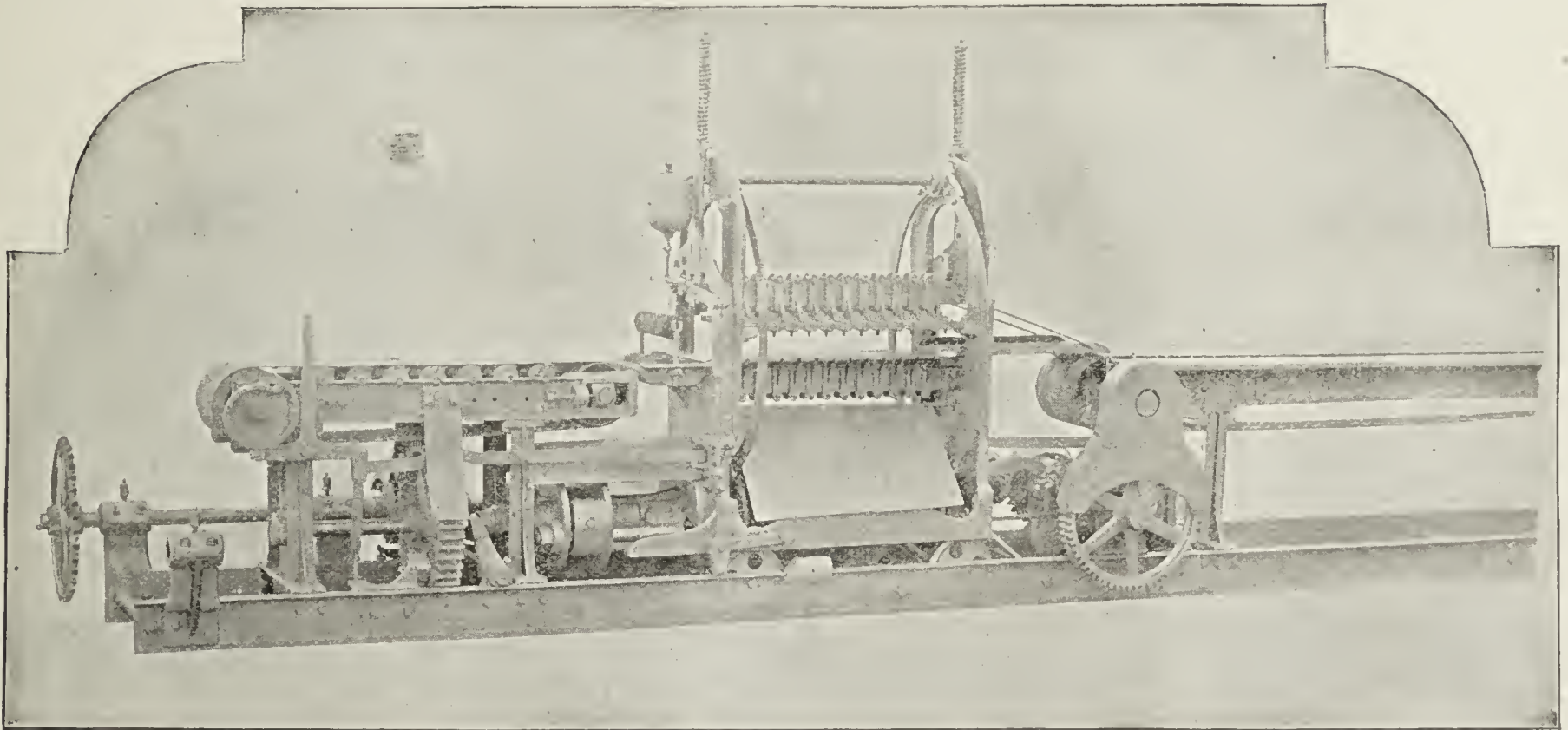


The Ear Marks of Originality are so  
Prominently Displayed in the . . . .

# Cunningham's Improved Combination Automatic End and Side Cut Brick Cutter,



That we Feel Justified in Claiming Priority.



There is a difference of opinion as to whether end or side cut brick is the best. With this Cutter, you can give your customer just what he wants and not what you happen to have.

For particulars regarding this Cutter, and a full line of Brick and Tilemaking Machinery. Address,

## Wallace Mfg. Co.,

CHICAGO AGENTS:  
Chicago Brick Machinery Co., Chicago, Ill.

FRANKFORT, IND.

See Ad. on Page 419.



**FOR SALE, WANTED, ETC.**

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

**WANTED**—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B. 101 d care Clay-Worker.

**WANTED** — Position as kiln setter on ornamental brick or all-around kiln man; prefer steady work. Can give good references. Address, R., 11 1 cm care Clay-Worker.

**WANTED** — Position as superintendent or manager by man of 15 years' experience. Have good position, but on account of bad health of family would like to change. Address SUPERINTENDENT, 11 1 c care Clay-Worker.

**WANTED** — A first-class paving brick burner; man who can furnish best references as to ability. Good permanent place for the right kind of man. Apply at once. ROSS KELLER BRICK MACHINE CO., St Louis, Mo.

**FOR SALE** — Brick and Tile plant located in Central Illinois. Run nine months this year (1898), and still running. Good trade at good prices for cash. Kiln capacity, 300,000 brick; steam dry room for 100,000 brick. Best of shale. Two railroads in yard. Coal 50 cents per ton on yard. Other business demanding attention cause for wanting to sell. Address, BRONAUGH BROS, 11 3 c. Virden Ill.

**MOULD SANDING MACHINE WANTED.**

Parties having a successful Mould Sanding machine that they want manufactured and placed on the market by an established concern that has been in the Brick Machinery business for several years will please address, "CHERRY," 11 1 d care Clay-Worker.

**SITUATION WANTED** — As foreman or superintendent in terra cotta, fire brick, building brick or sewer pipe plant. Also understands enameling and glazing. Over thirty years' experience. Best of references. S. T. LEWIS, 11 1 d. care Clay-Worker.

**FOR SALE** — One improved double pressure four-mold Andrus Press, with two good molds for same; also one Schoellhorn & Albrecht Clay Disintegrator, all in good condition; will sell cheap. Good reasons for selling. Address, ILLINOIS SUPPLY AND CON. CO., 11 1 d St. Louis, Mo.

**FOR SALE** — The Campbell Brick Plant; unlimited supply of clay; best location in the country for manufacture of paving brick; large local demand; their brick stand the highest tests and have the best of reputation. Address CAMPBELL BRICK CO., Ithaca, N. Y. 11 1 dm.

**FOR SALE** — Clay manufacturing plant, with steam power and four muffled kilns, etc.; situated in New Jersey, twenty miles from New York City; best clay locality; suitable for pottery or tile work. Will either lease, sell or take interest in business. Address, New Jersey Mfg. Co., 11 1 d care Clay-Worker.

**FOR SALE** — The Hawarden Brick and Tile factory, partially destroyed by fire, at a bargain. Large tributary territory and unlimited supply of excellent shale. Samples can be seen at the Clay-Worker office, or will be sent upon application. Correspondence solicited. Address, FIRST NATIONAL BANK, 11 2 cm Hawarden, Iowa.

**WANTED** — A practical brickmaker to run a plant. One with small capital to take half interest in the business. Made this season 1,500,000. All sold and could have disposed of 5,000,000. This offer made on account of death of one of the partners. Plant situated in Tidewater, Virginia. Books open for inspection to party who means business. A rare opportunity for the right man. Address, TIDEWATER, 11 3 cm care Clay-Worker.

**FOR SALE** — Three Eagle Represses, as good as new; scarcely used at all, owing to change of process, making repressing unnecessary. They are the latest improved design and will be sold at a bargain. Address BUSY BOY, 11 1 d care Clay-Worker.

**BRICK PLANT FOR SALE.**

The Board of Directors of Central City Brick Company will sell at public sale at the front door of the Court House, in the city of Syracuse, N. Y., on the 15th day of December, 1898, at 10 o'clock A. M., to the highest bidder, the plant and works of said company, which are situate about one mile east of the village of Kirkville, N. Y., on the bank of the Erie Canal, and consist of forty acres of land with inexhaustible deposits of clay and shale, four down-draft kilns of Flood pattern; one new Boyd press, one Whittaker press, two boilers, engine, dry pan, grinding machine, tools, appliances, etc., and everything ready to start at once. Splendid facilities for shipment; terms to be announced at sale.

For further information, address, W. A. LATHROP, Secy., 119 to 121 South Clinton St., Syracuse, N. Y. 11 1 dm

**ADMINISTRATOR'S SALE.**

Of the property of the Alabama Brick Manufacturing Co., located on Southern Railway, midway between Atlanta and Birmingham, and near Anniston, Ala., and consisting of the Brick Works and 47½ acres of clay lands.

The plant has three Morrison's Kilns, of 350 M. capacity each, one Sharer Dryer, with full equipment of cars and pallets. Mill house, two engines, boiler and machine (25 M. daily capacity), R. R. switch, 1,100 feet long; plenty of light T rail, with clay cars; office and commissary. The whole in complete running order. Clay is plastic, shale and buff, suitable to manufacture of common and fine brick of all shades, and of terra-cotta. Cheap labor, freight and fuel, with good market for product. Will be sold at auction December 19, 1898. Terms one-third cash, balance one and two years. J. H. BARKER, Admr. 11 1 dm. Choccolocco, Ala.



# ON TOP!

That's Where We are With Our

.... Up-to-Date Machinery.

**On Top** with our new Berg Dry Press—it's a World-beater.

**On Top** with our Paving Brick Machinery and our Brick and Tile outfits.

**On Top** with our new Automatic Cutter.

**On Top** with our Soft Mud Machinery.

**ALWAYS ON TOP.**

Send for Circulars. We can put you on Top too!

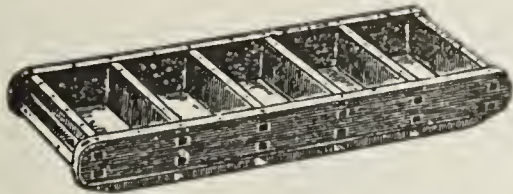
**Chicago Brick Machinery Co., 225 Dearborn St.**



FOR SALE, DRY PRESSES.

I have two Simpson Dry Presses, that are just as good as new, that I will sell for \$1,500 each, F. O. B., Cleveland, Ohio. These presses cost \$3,500 each. FRANK B. MANY, 809 Cuyahoga Bldg., Cleveland, Ohio.

G. COLDEWE & CO.,



MANUFACTURERS OF ALL KINDS AND SHAPES OF HAND and.... MACHINE MOULDS

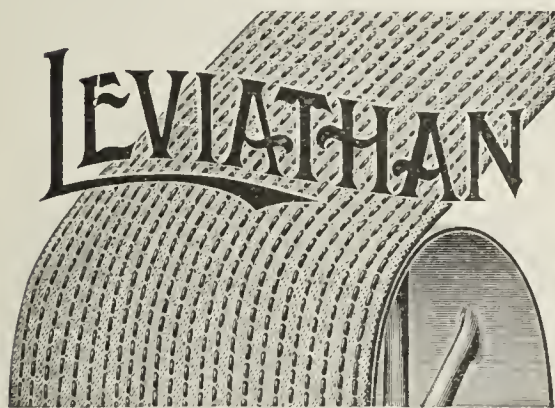
We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

"LEVIATHAN."

"Upon Earth There is not His Like."



MAIN BELTING CO., Sept .....1896.  
55 and 57 Market St., Chicago, Ill.  
GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige. Yours very truly,

Manufactured under Special Process.  
A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

MAIN BELTING COMPANY,

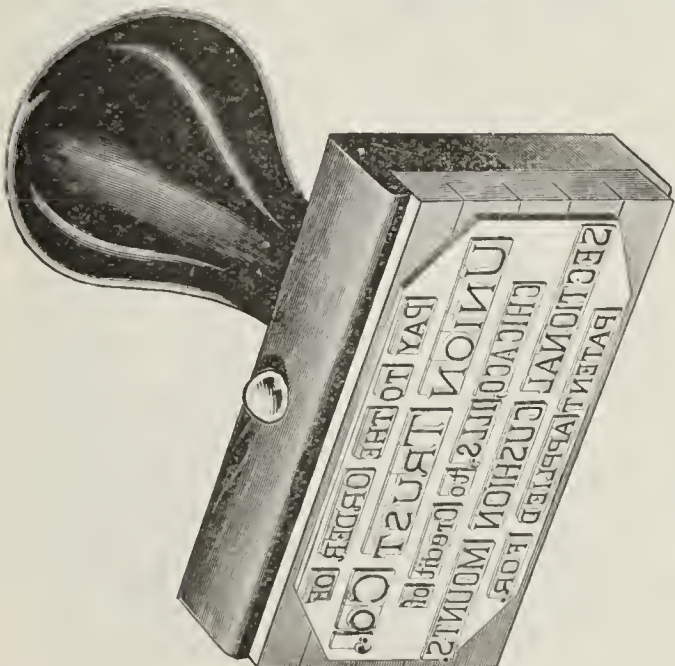
Sole Manufacturers LEVIATHAN BELTING,

55 and 57 Market St., CHICAGO, ILL.

PHILADELPHIA: 1219 Carpenter Street.

BOSTON 120 Pearl Street.

Rubber Stamps



Of Every Sort and Kind.

Brick and Tile Manufacturers save time and avoid errors by stamping order blanks, weigh bills, delivery receipts, etc., etc. We make a specialty of stamps for Clayworkers, and can furnish promptly any character of stamp wanted.

Mail orders given special attention. Write for samples and prices.

Hoosier Stamp Co., Indianapolis, Ind.

Stamps delivered carriage free to any post office in U. S. and Canada.

WANTED—One good kiln setter and one good brancher. Address SAN ANTONIO SEWER PIPE & MFG. CO., 103 d San Antonio, Texas.

WANTED—Position as superintendent. Chambers Bros. machine preferred. Ten years experience. Salary moderate to commence. 111 d m THOMAS, care Clay-Worker.

FOR SALE.—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 11 f d JESSE T. MORGAN, Wilkes-Barre, Pa.

FOR SALE—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN, Room 13 Palmer House, Chicago, Ill. 3 t f d

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer. T. W. CARMICHAEL, Inventor and Manufacturer, Clarksburg, W. Va. 6 t f d

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator. C. SIEDLER, Pres. 9 t f d 156 Fifth Ave., New York, N. Y.

WANTED—A party thoroughly experienced in the manufacture of brick from coal measure fire clays, mill brick, vitrified brick, pipe, etc., with some capital, to combine and form a company to work some veins of fire-clay in connection with a coal mine. Every advantage as to location and cheap production, and fuel. Clays and coal within 200 miles of Baltimore and Washington on B. & O. R. R. Address E. COAL COMPANY, 93 e care Clay-Worker.

ENGINE FOR SALE.

One 22x30 centre crank, Throttling governor, heavy duty engine; the same is new, never having been set up. Will sell cheap for cash. Estimated horse power 250. 93 e SHARP BROS., New Philadelphia, Ohio.

FOR SALE, CHEAP.

Two four-mold Johnson semi-dry press brick machines and four represses. Used six months. Duplicates of this machinery can be seen working at the Christy Fire Clay Co's. Works, St. Louis, Mo. Reason for selling, not suitable for manufacturing vitrified paving brick. Address, 103 d THE BARR CLAY CO., Streator, Ill.

FOR SALE

One 1½ yard Marion steam shovel. Lot of new and second-hand dump cars. Seven narrow gauge and one standard gauge second-hand locomotives. One Potts Stock Brick Machine. One Potts sanding machine. One seven-foot horizontal pug mill. Two vertical pug mill, etc. We manufacture a full line of grinding and mixing pans for brickyards, ch. mists, smelter, clay pot manufactures, etc. etc. THOMAS CARLIN'S SONS, Allegheny, Pa.

FOR SALE, LEASE OR EXCHANGE.

FINE CLAY LAND—A BARGAIN.

I have about 225 acres. 100 of which is clay suitable for the finest brick, both red and buff, runs 25 feet above navigable water on which it fronts 500 yards. Newport News, Norfolk, Portsmouth and Hampton, and Fortress Monroe all terminal of railroads reaching to every section of the country and which are rapidly forging to the front, use 100 or more millions of brick a year and are distant about 35 miles. The soil or clay on all the water routes is quite sandy and unfit for making the finest grade of brick, for which my clay is especially suited. There is also a large demand among the truckers around Norfolk for tile which they have to get elsewhere. There is no clay in Virginia better for that purpose than mine. I have a large brick mill supplied with water from an unfilling pond. House 30 by 60, three stories and an annex 24 by 40, two stories; dwelling house, kitchen, out houses of every description, barns, stables, quarters for hired hands, etc. 50 or 60 acres of land cleared, balance heavily timbered. Wood costs at kiln \$1.50 per cord, labor 50 to 75 cents per day. Lumber \$8 per M. transportation \$1 per M. I will take for the entire property, all of which is in excellent order \$6,000—\$2,000 cash and balance in five annual installments, with interest at six per cent. The cleared land is in excellent state of cultivation all in growing crops. The property lies on the James River. Address 91 c JONES, care Clay-Worker.



**FOR SALE.**

One Monarch machine, only used one short season.

One extra heavy Quaker machine in good order.

One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.

HORTON MFG. CO.,  
Painesville, Ohio.

**FOR SALE.**

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.

6 spring brick trucks.

Lot shafting, belting and pulleys.

1 Barr Pumping Company steam pump.

All new or little used, and in excellent condition.

WALNUT,  
Care Clay-Worker.

**FOR SALE.**

A terra cotta plant located in Berlin, Conn. Good railroad accommodation, switch runs alongside of building and fitting shed. Brick building 100 x 50 feet, two stories high, of heavy construction, 1,500 square feet floor space. Dry floor 100 x 17 feet. Engine house 40 x 25 feet, 50 h. p. engine and 80 h. p. boiler; dry pan, Disintegrator and pug mill, 5,000 lb. elevator; two 14 ft. kilns and everything in first-class condition, ready to start at once.

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Samples, Prices and Booklets on Request.

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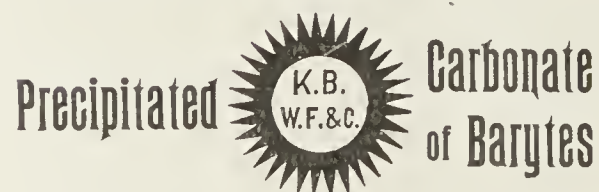
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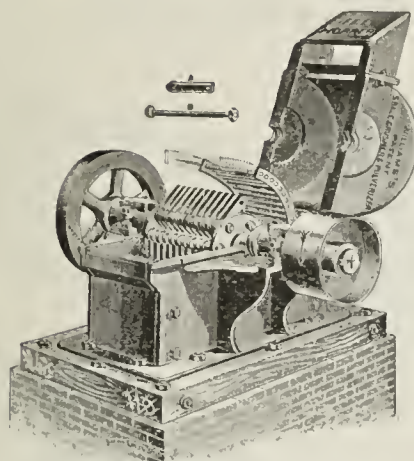
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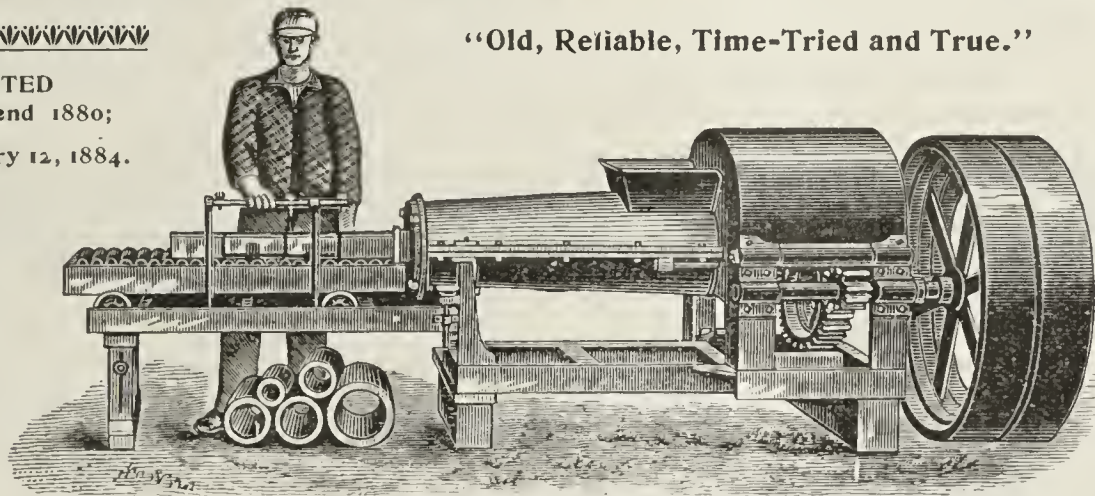
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PATENTED

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## H. C. BAIRD & SON, PARKHILL, ONTARIO.

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Complete sets including general plan and elevation of works.

Plans and sections of machine room.

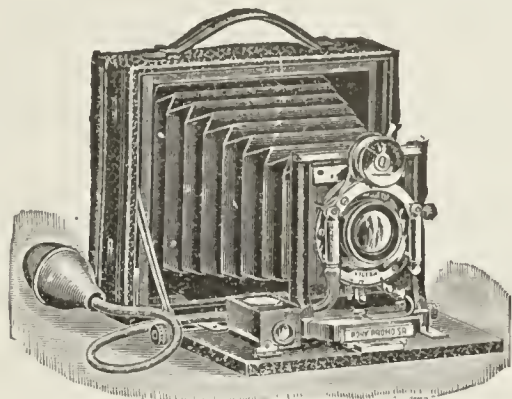
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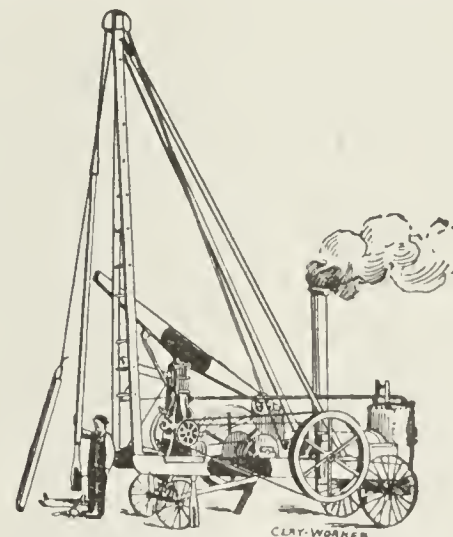
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Machine  
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5 or 6 brick ..... \$1.75 each  
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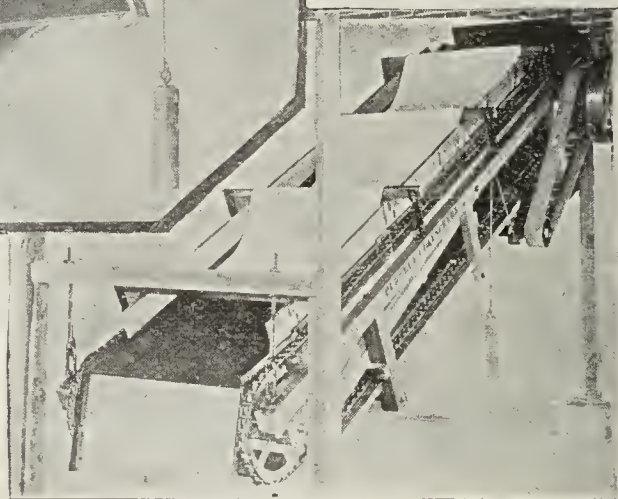
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It will more  
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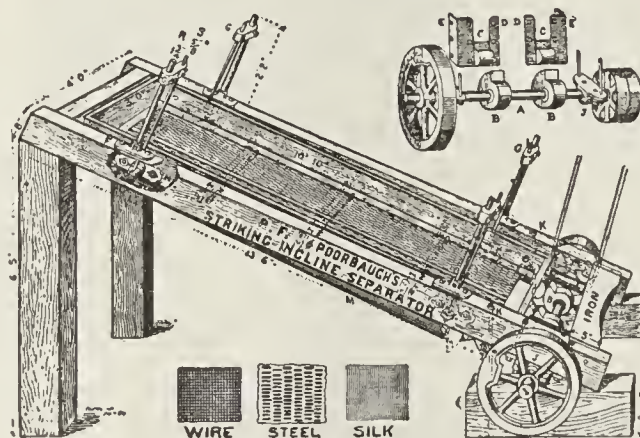
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These Screens are in use at Brick yards  
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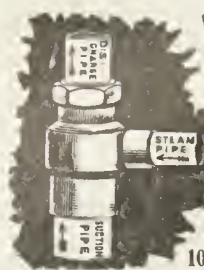
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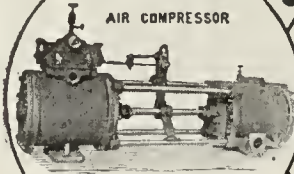
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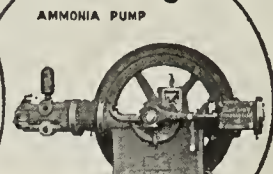
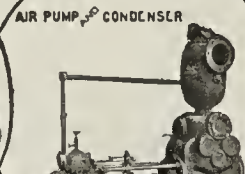
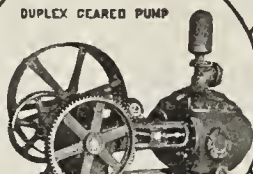
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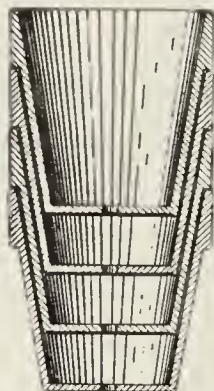
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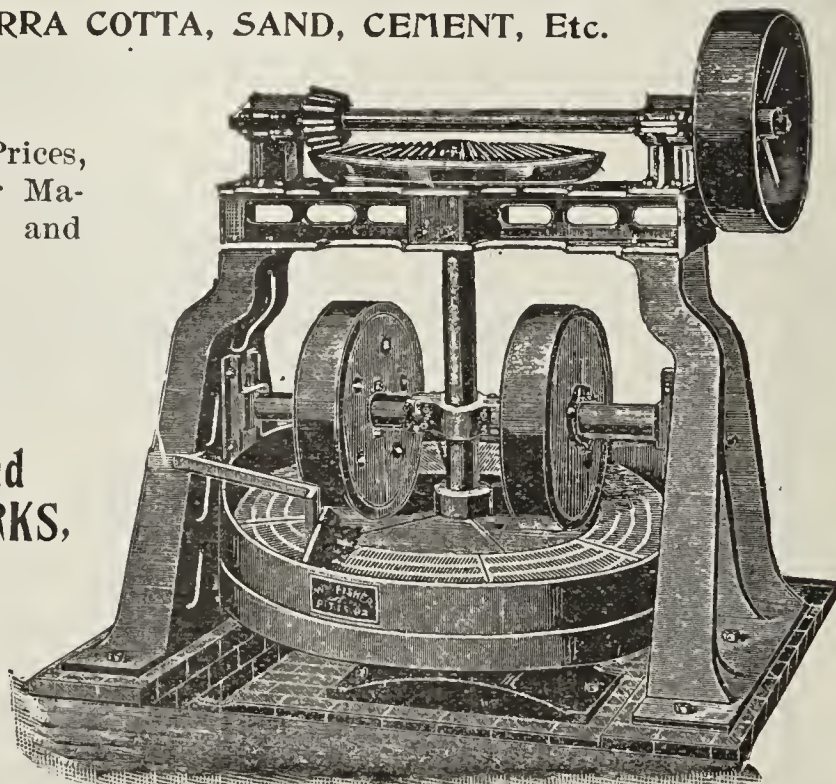
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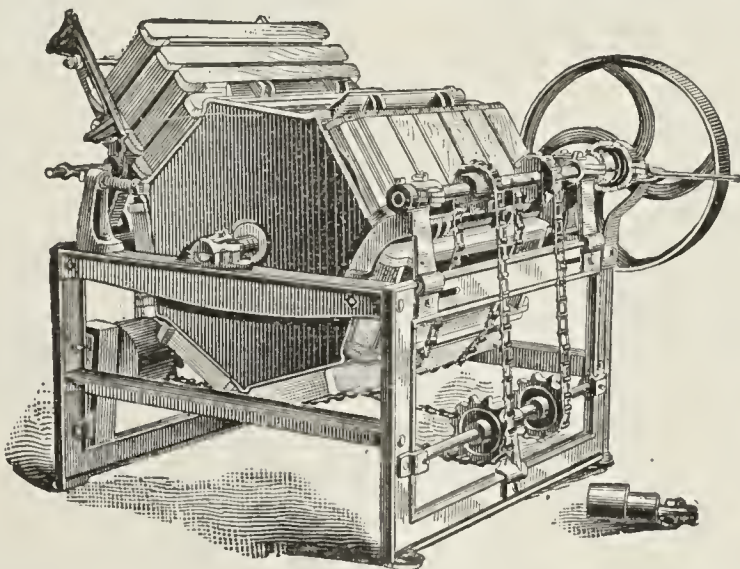
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Also Furnish  
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NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.  
\*No. 22 Passenger..... 1:20 p. m.  
No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

\*No. 21 Passenger..... 10:20 a. m.  
No. 23 Passenger..... 2:50 p. m.  
No. 25 Passenger..... 6:20 p. m.  
\*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on  
A. H. SELLARS, Agent,  
Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.  
INDIANAPOLIS, IND.

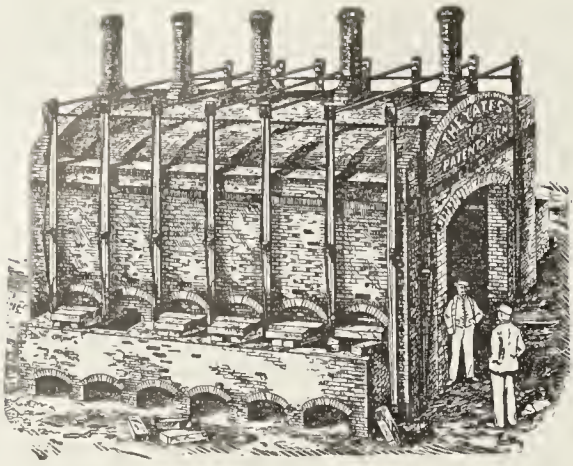
## SIMPLICITY

### THE DOTS IN OUR HALFTONES

HAVE A SHARP  
PRINTING QUALITY.  
SEND FOR '98 CATALOG

INDIANAPOLIS  
ENGRAVING AND  
ELECTROTYPING CO.





**For Economy of Fuel and Percentage of Hard Burned Brick.**

This kiln has no equal, come and see what we are doing.

**ALFRED YATES,**  
Man. Johnsonburg Vitrified Brick Co.,  
Johnsonburg, Penn.

## WEST and SOUTH

run the lines of the  
Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

|                               |             |
|-------------------------------|-------------|
| South Dakota                  | Kentucky    |
| Minnesota                     | Tennessee   |
| Iowa                          | Arkansas    |
| Wisconsin                     | Mississippi |
| Illinois, Indiana, Louisiana, |             |

Presenting an unequalled territory for diversified industries, and possessing

**Fine Sites for New Mills,  
Best of Freight Facilities--Coal  
Fields--Close Proximity to  
Distributing Centers.  
Intelligent Help of all Kinds.  
Many Kinds of Raw Material.**

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. **GEORGE C. POWER**, Industrial Commissioner I. C. R. R. Co., Chicago.

**THESE ARE WHAT WE ENGRAVE ON.**

**REMEMBER: ONLY FIRST QUALITY.**

**INDIANAPOLIS ENGRAVING AND ELECTROTYPING COMPANY.**

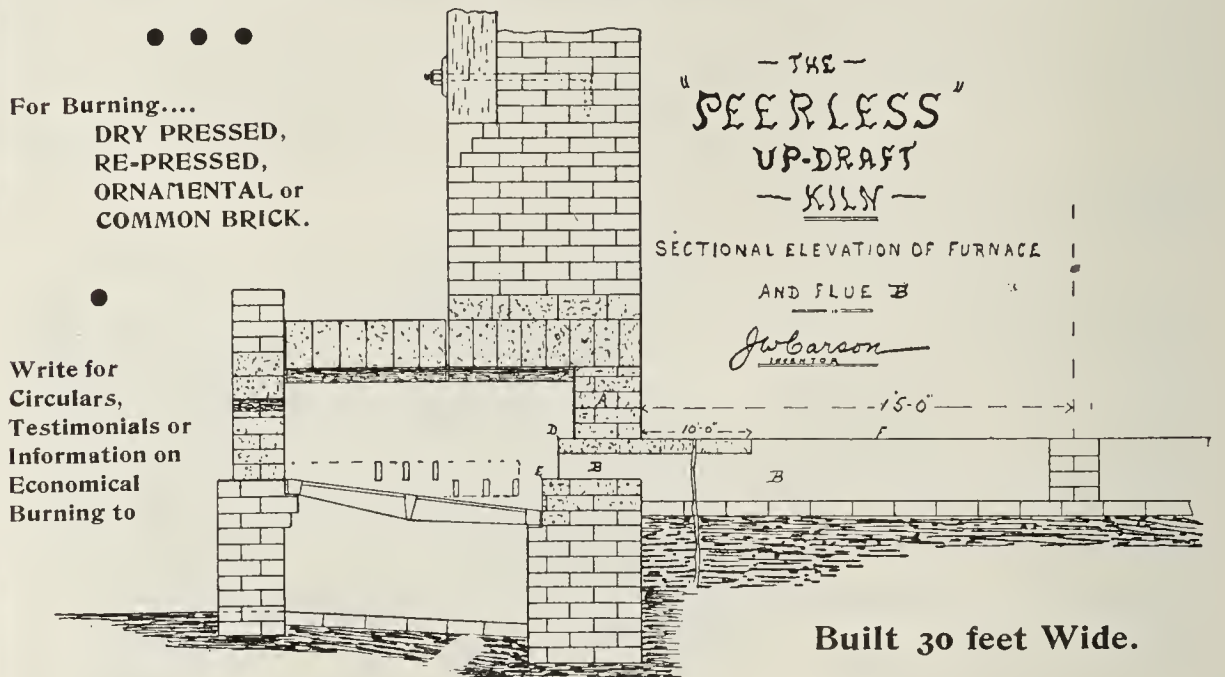
# BRICK CARS and TRUCKS

Of Any and All Kinds.  
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

**THE ATLAS BOLT & SCREW CO.,**  
Cleveland, Ohio.

## The "PEERLESS" UP-DRAFT ...KILN.



**J. W. CARSON, LaPrairie, P. Q., Can.**

Mey Detachable Chain Belt.

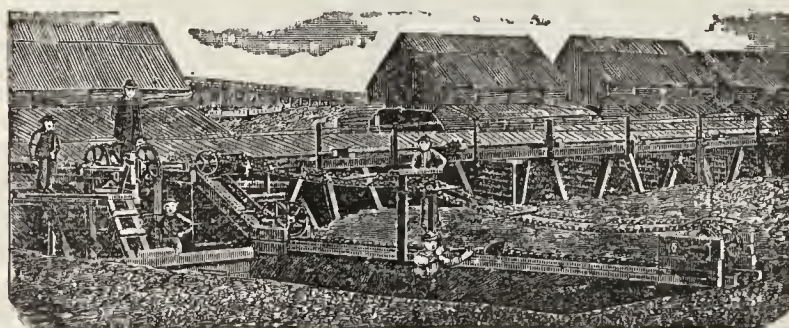
Ewart Detachable Chain.

**F. H. C. MEY,**  
**Chain Belting Engineering Works,**

Approved Appliances for  
**Elevating, Conveying and Transmission of Power,**  
**64 to 68 Columbia St., BUFFALO, N. Y.**

**THIS Elevator** is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

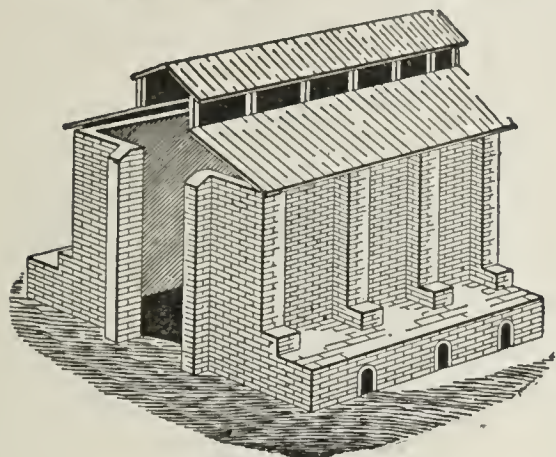
**Make  
Many More  
Thousands**

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

**Send for Catalogue**



Mention the CLAY-WORKER  
WHEN WRITING TO ADVERTISERS,  
Mention the CLAY-WORKER.



Up-Draft Kiln.

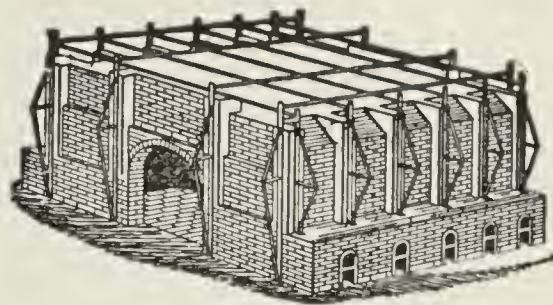
## LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.  
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

# The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has no equal for uniformity in burning, hardness of ware and economy in fuel.

The Alsip system of utilizing waste heat from cooling kilns, saves Thousands of dollars in fuel every year.

The simplest and most successful system in use.

Investigate and be convinced.

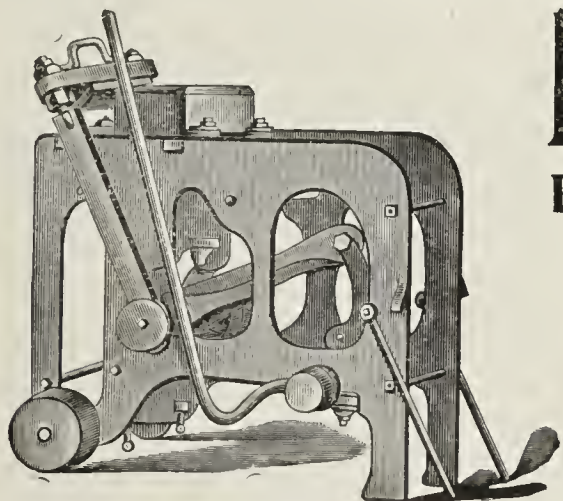
Any information at my command will be cheerfully given on the subject of drying and burning clay ware.



Address, **S. H. ALSIP,**

Days Brick Works.

BELLEVILLE, ILL.



RED BRICK PRESS.

**GEORGE CARNELL,**

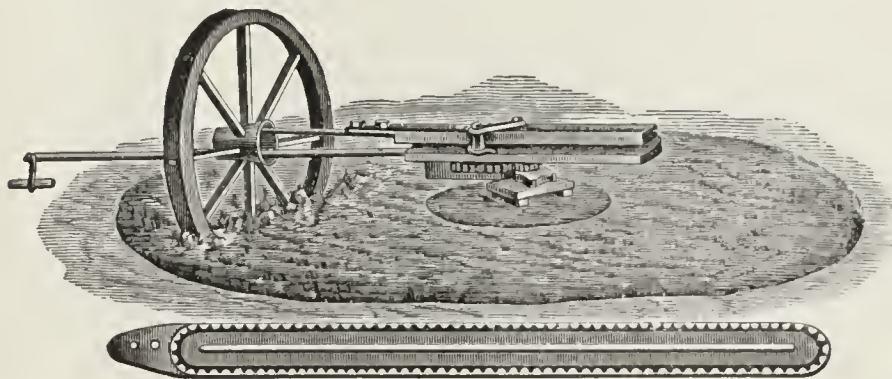
Nos. 1,819, 1,821 and 1,823 Germantown  
Avenue and Fifth Street,  
PHILADELPHIA, PENN.

## PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.

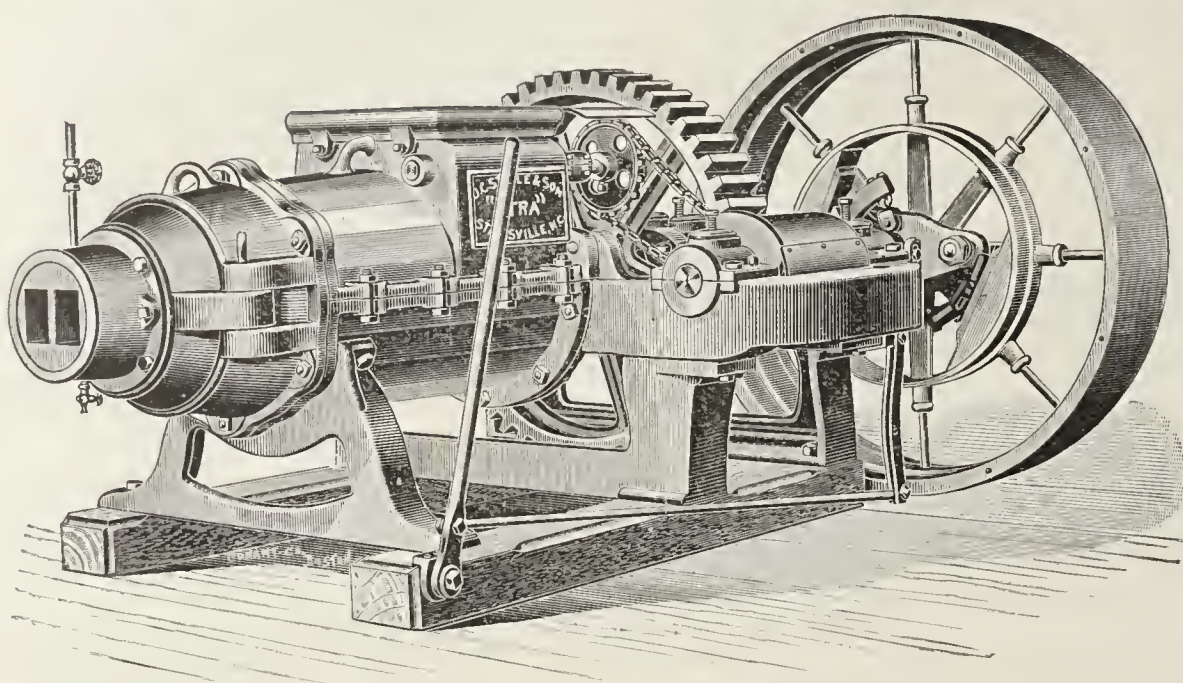


These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing and fitted up 16 per cent cheaper.

Send for Circular and Price-List.



# Five Steele Machines SOLD IN OCTOBER,



X-tra Machine. Capacity 25,000.

Because they are Built and Sold Right.

Lavinia, Ga., September 12th, 1898.  
Messrs. J. C. Steele & Sons,  
Statesville, N. C.

Gentlemen:—Your favor received, and in reply beg to say that the Steele Brick Machine is as good as I want. Can make 40,000 per day with it. I am more than pleased with the automatic cut-off. Yours truly,  
J. H. SEWELL.

Mr. Sewell is using our Xtra Machine with automatic cutting table.

J. C. STEELE & SON,  
Statesville, N. C.

## The Standard Brick Machines,

MANUFACTURED BY

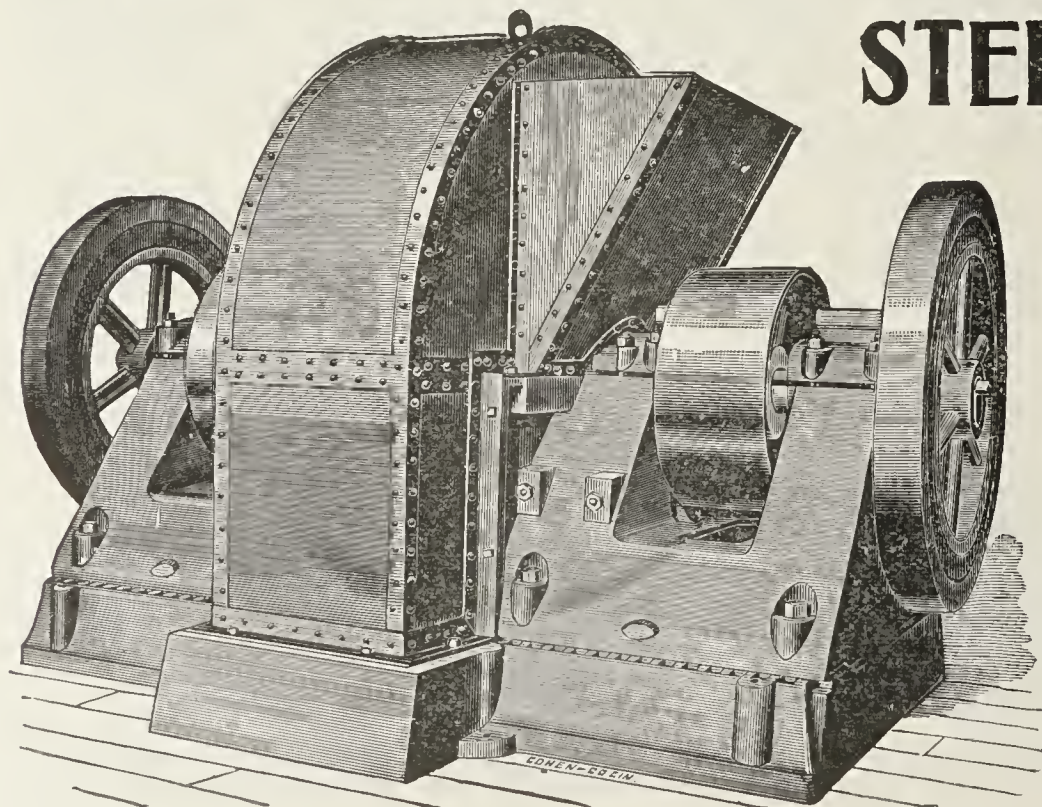
A. M. & W. H. WILES CO.,  
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.  
[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



## STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly  
Pulverizing Clay in a  
Dry, Semi-Dry or  
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

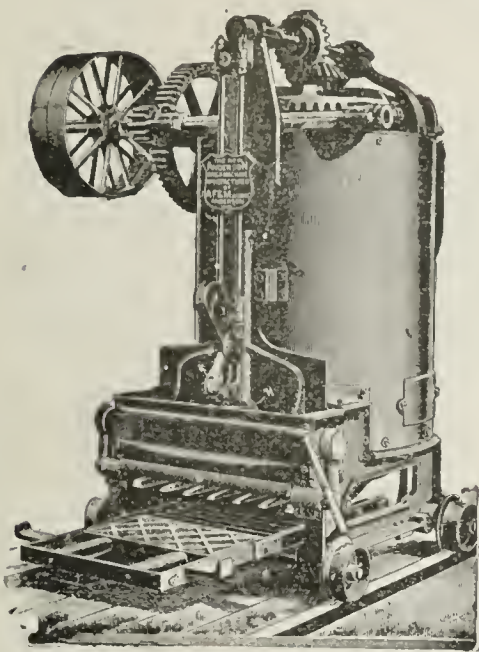
Stedman's Foundry & Machine Works,

Aurora, Ind.



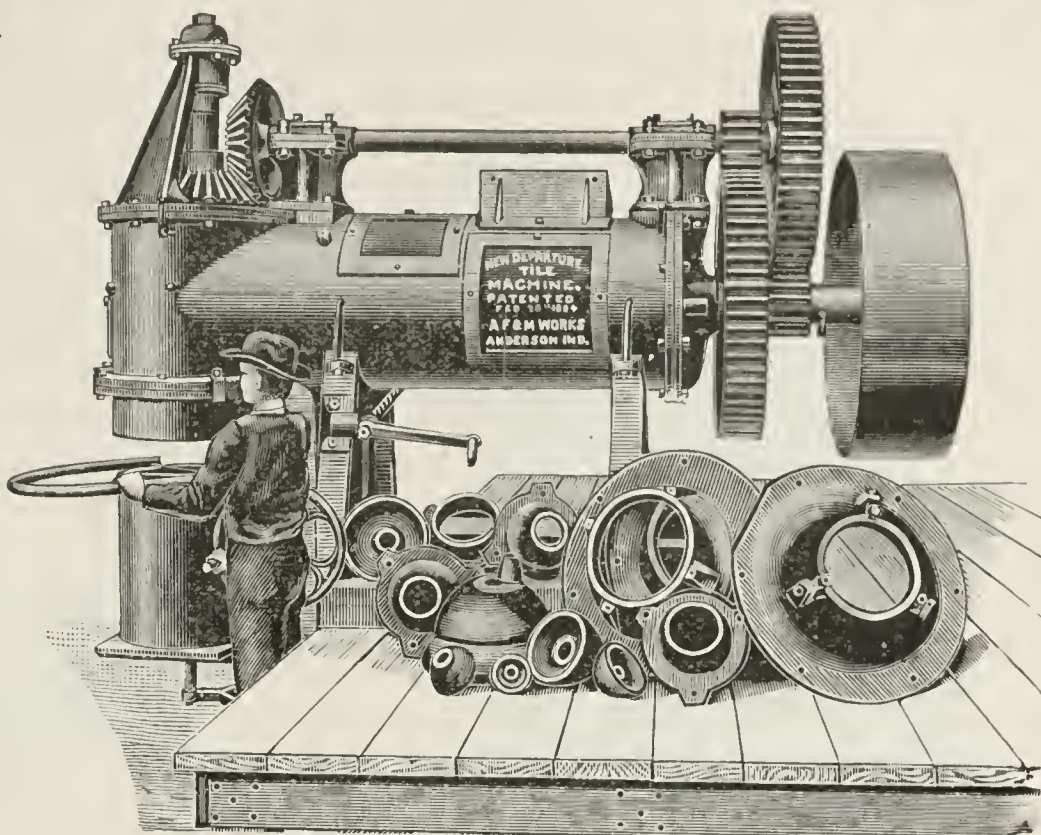
# New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.  
Steam Power.

Write  
for  
Catalogue  
and  
Prices.



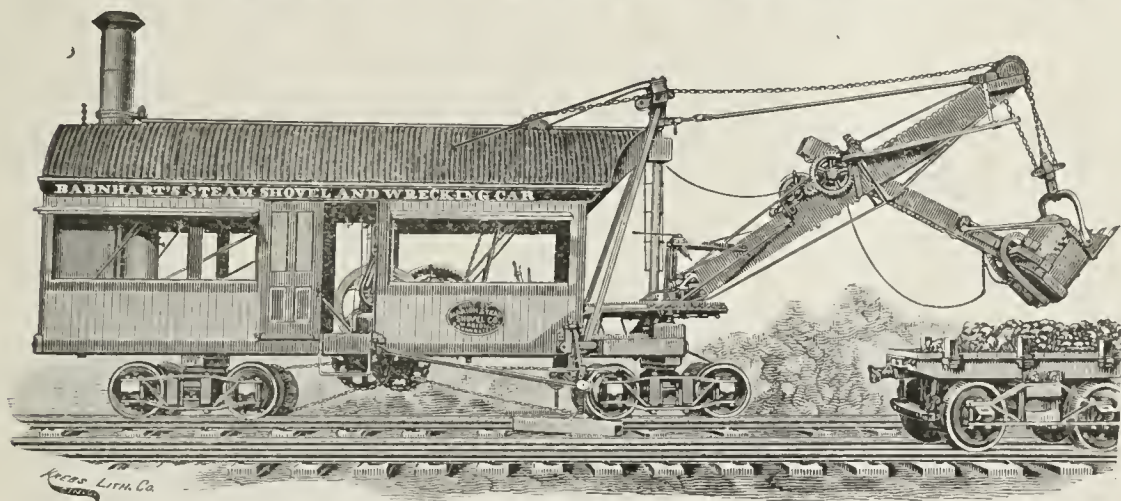
NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

## Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

**The Marion Steam Shovel Co.,**

603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

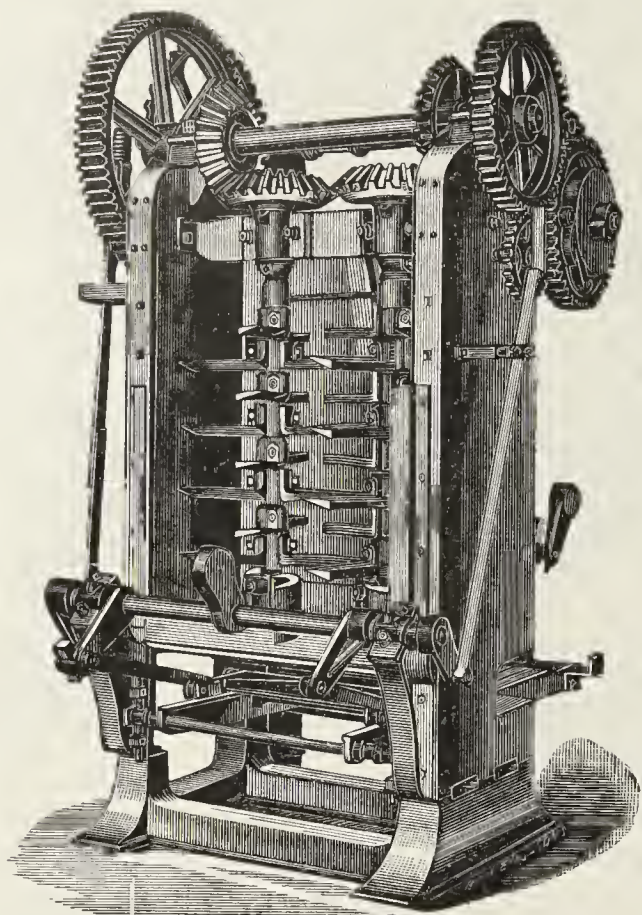


STYLE C—¾ YD.



# THE DUPLIX,

Is the Standard of all Soft Clay Brick Machines.



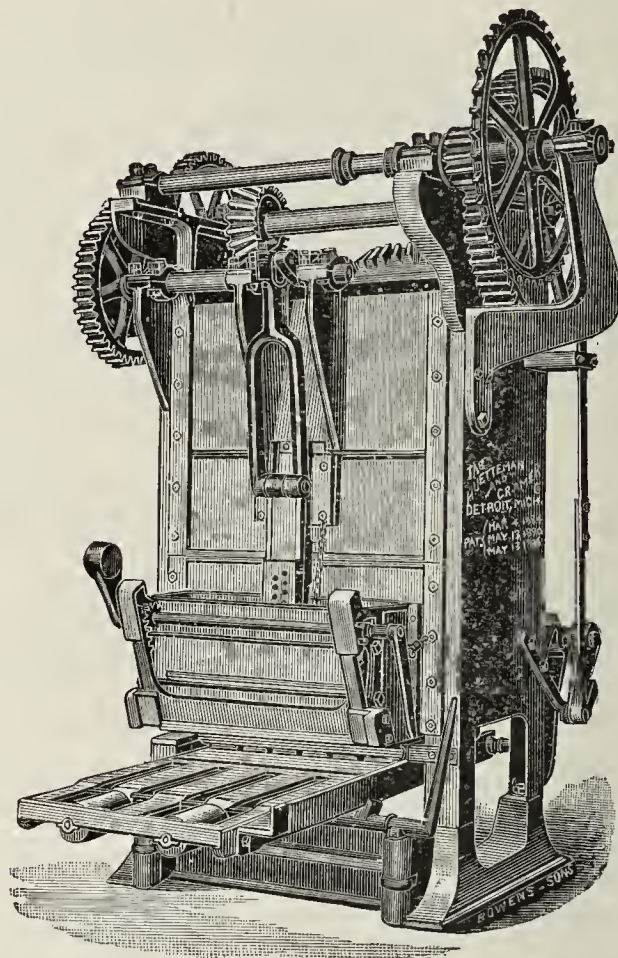
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE  
AND PRICES TO

The Huetteman  
& Cramer Co.,

Manufacturers of the Duplex Brick Machine and general outfit for  
brickyards,

12, 14 & 16 Sherman St.,  
DETROIT, - - MICH.



## THE HENRY MARTIN BRICK MACHINE MFG. CO.,

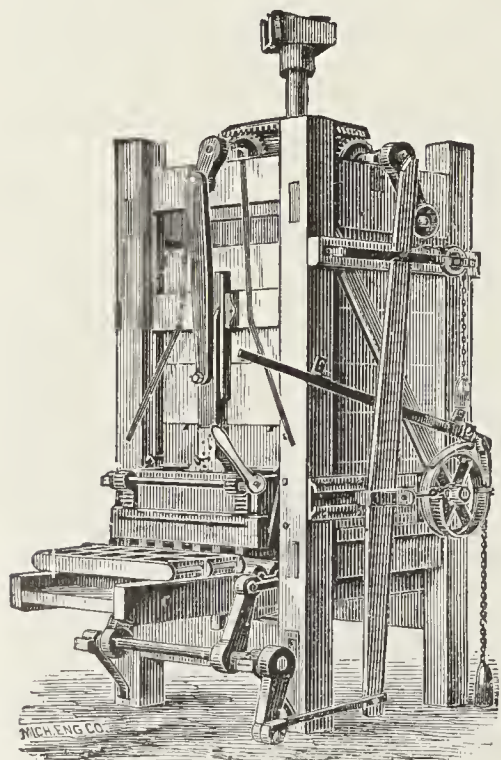
ESTABLISHED 1857.

LANCASTER, PA., U. S. A.

INCORPORATED 1887.

INVENTORS, MANUFACTURERS AND EXPORTERS OF STEAM AND HORSE POWER

## Brickmaking Machinery.

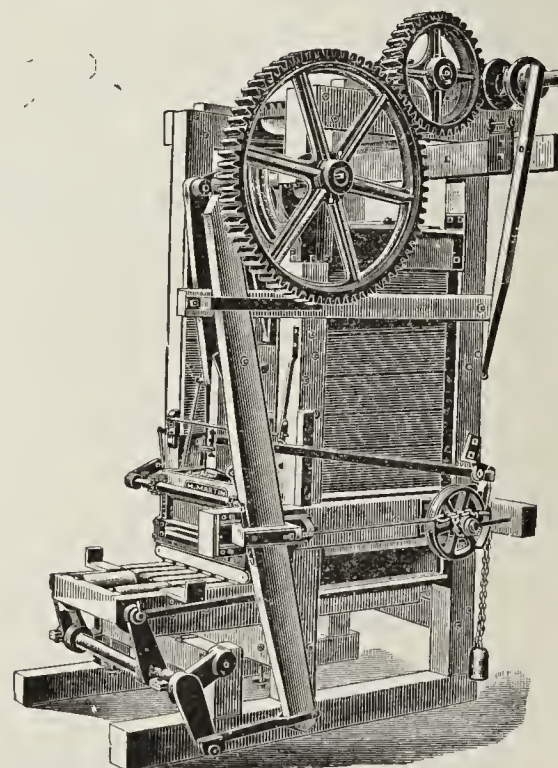


Horizontal Pug Mills,  
Moulds, Patent Double and  
Single Decked Trucks,  
Barrows, Turn Tables, Etc.

Plans, specifications and illustrated Catalogue of complete plants will be furnished free of charge on application. We warrant our Machines to work in any kind of clay that can be worked by hand, and to make brick of any ordinary size.

### Stone Crushers,

Clay Crushers, Sand Grinders,  
Clay Screens, etc., etc. . .



CAPACITY 2,000 BRICK PER HOUR.  
WEIGHT 5,200 POUNDS.

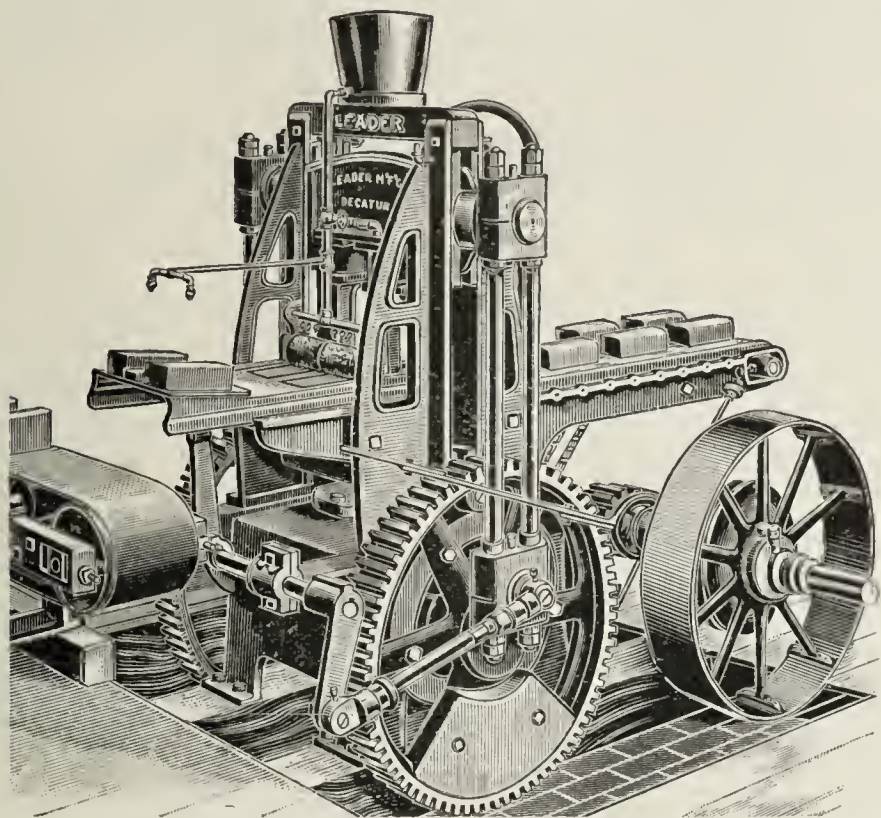
Telegraphic Address, ✕ Postal Telegraph-Cable Co.  
"Martin, Lancaster." ✕ wires in our Office,

CAPACITY 40,000 BRICK PER DAY,  
WEIGHT 10,500 POUNDS.



# Leader Brick Machinery

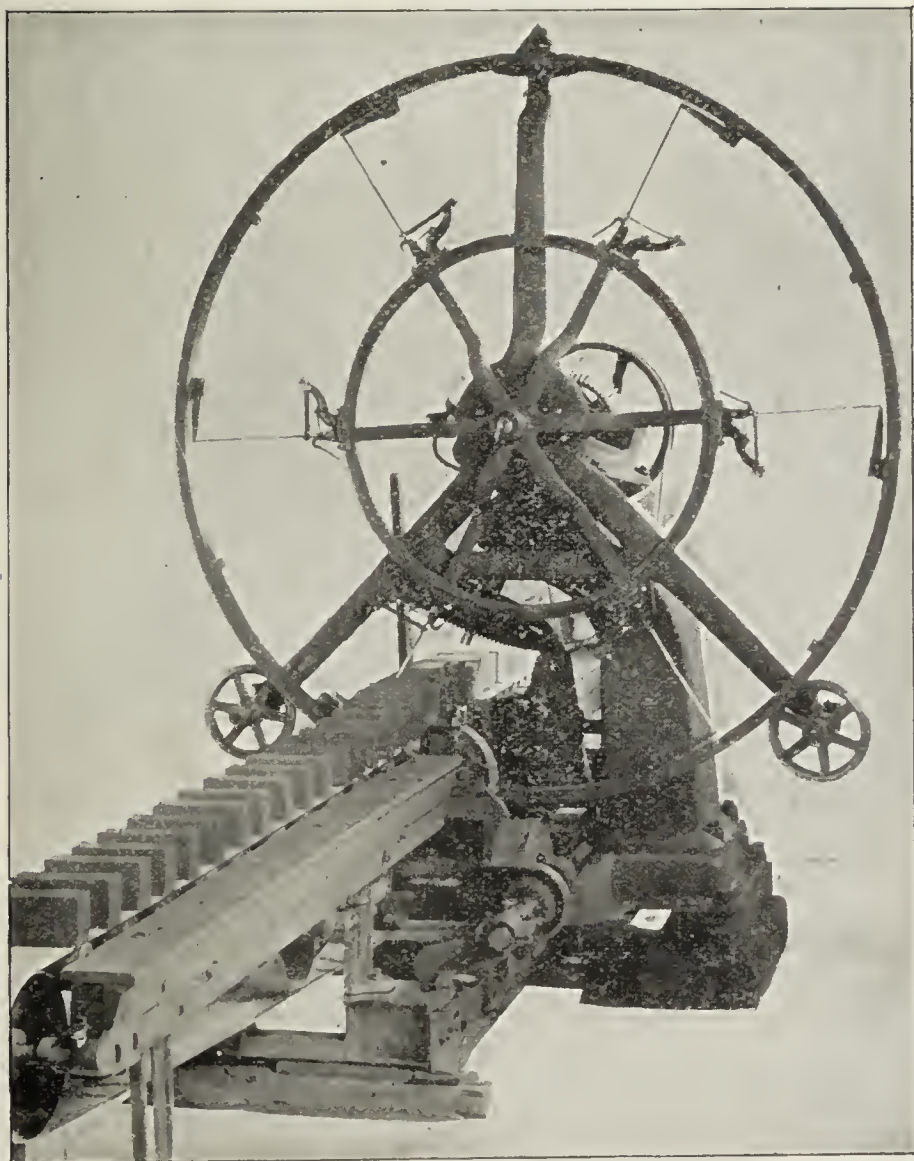
**Is Not Surpassed.**



Is cheaper in the Long Run  
and Costs no More at the  
Beginning than the other Kind.

The Leader Repress is a double die machine of liberal dimensions, simple, convenient, effective, durable and light running, and is fully described together with our brick machines in sectional Catalogue number 101, which will be mailed free to any address.

**LEADER MANUFACTURING CO., Decatur, Ill.**



The Chambers Automatic Side-Cutter.

## Automatic Side-Cutter For Stiff-Tempered Brick Machines.

**A**UTOMATIC CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

The machinery is above the dirt and all gearing encased.

MANUFACTURED and  
GUARANTEED. . . .

**Chambers Brothers Co.,**  
**PHILADELPHIA, PA.**



# Morrison's Latest

## Improved Kiln,

### FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

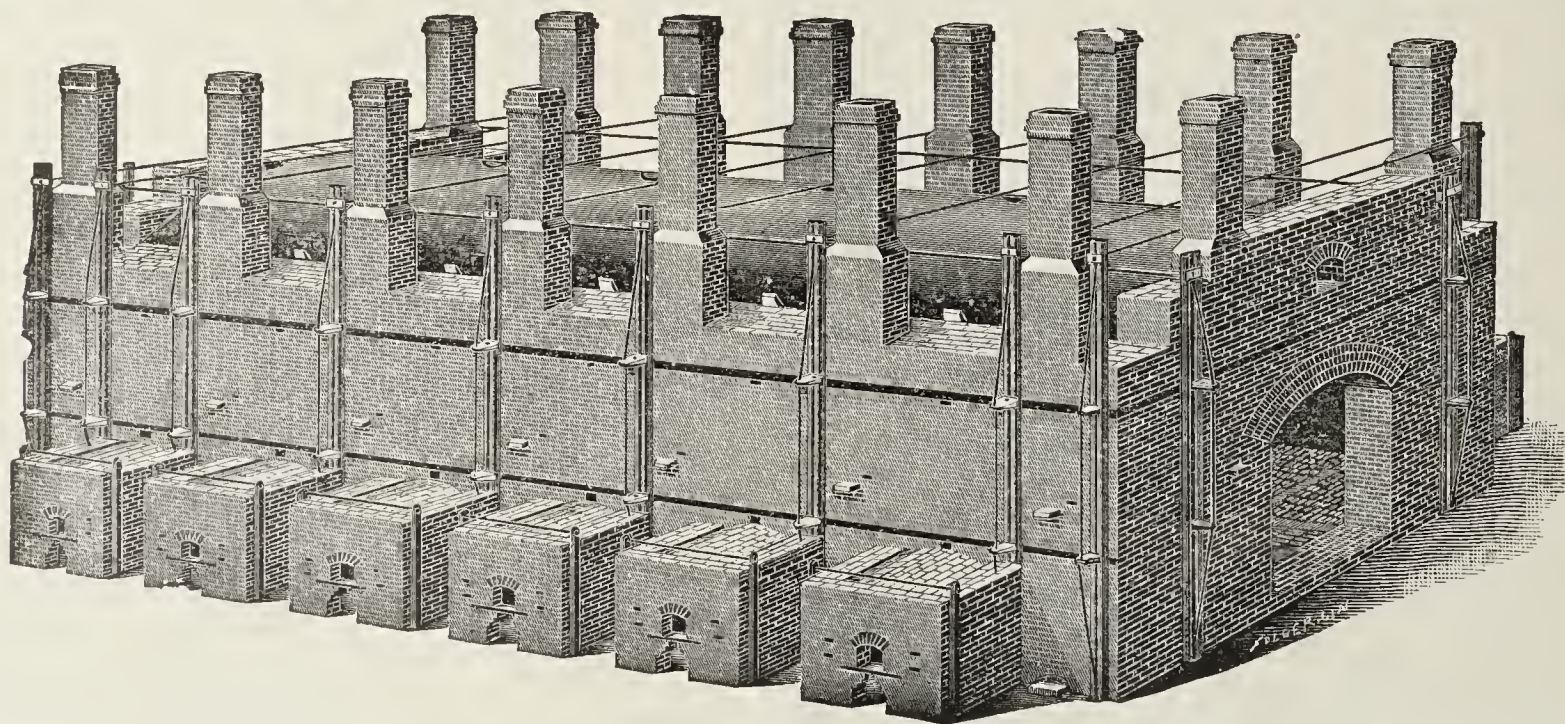
Write us for descriptive pamphlet, prices, etc., address

**R. B. MORRISON & CO.,**

*P. O. Box 335.*

*ROME, GA., U. S. A.*

## **The EUDALY** IMPROVED — DOWN-DRAFT KILN and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

**W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.**



# HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.

Horseheads Brick Co., N. Y., August 13, 1898.

Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

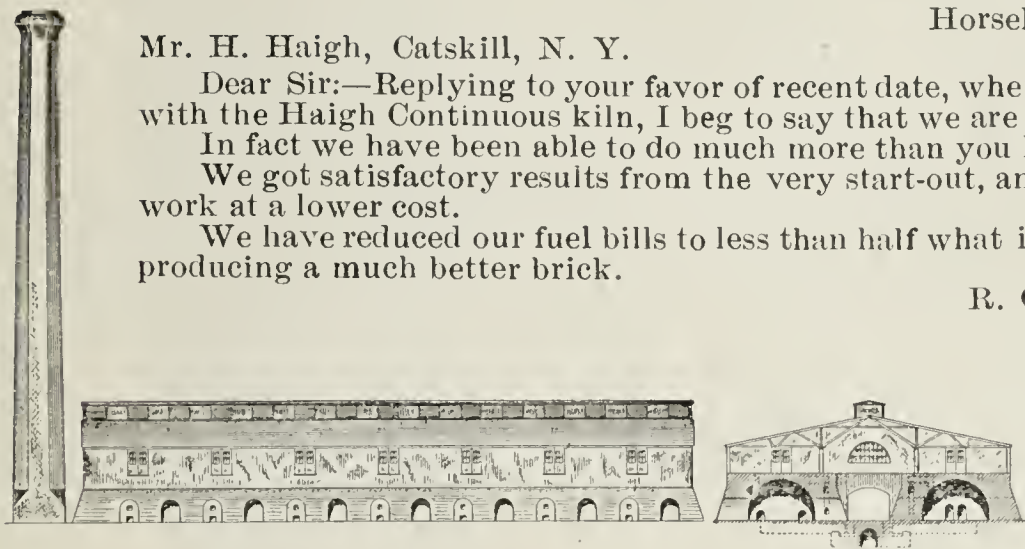
We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,

R. G. EISENHART, Treas. and Gen. Man.

This kiln has now been in operation nearly two years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at \$2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.



Address **H. HAIGH, Catskill, N. Y.**

## The Lehmann <sup>Portable</sup> <sub>Continuous</sub> Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaatt Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

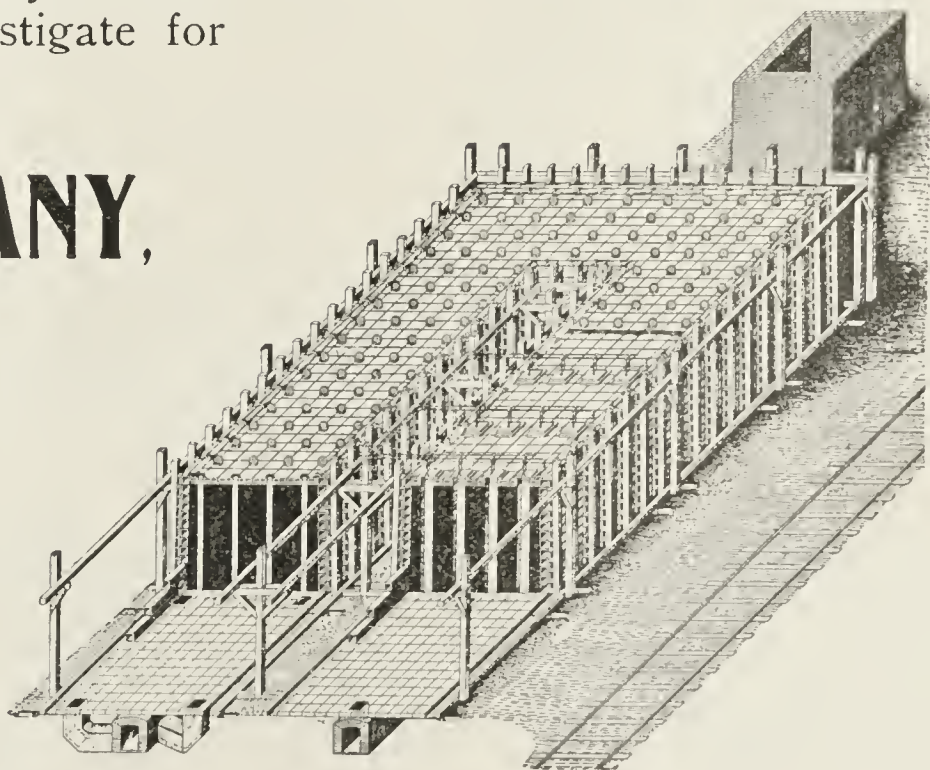
### F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers,  
Plans and estimates furnished for Brick, Lime and  
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has  
been in successful operation with crude  
oil during the last year and can be adapted  
to all kinds of fuel.



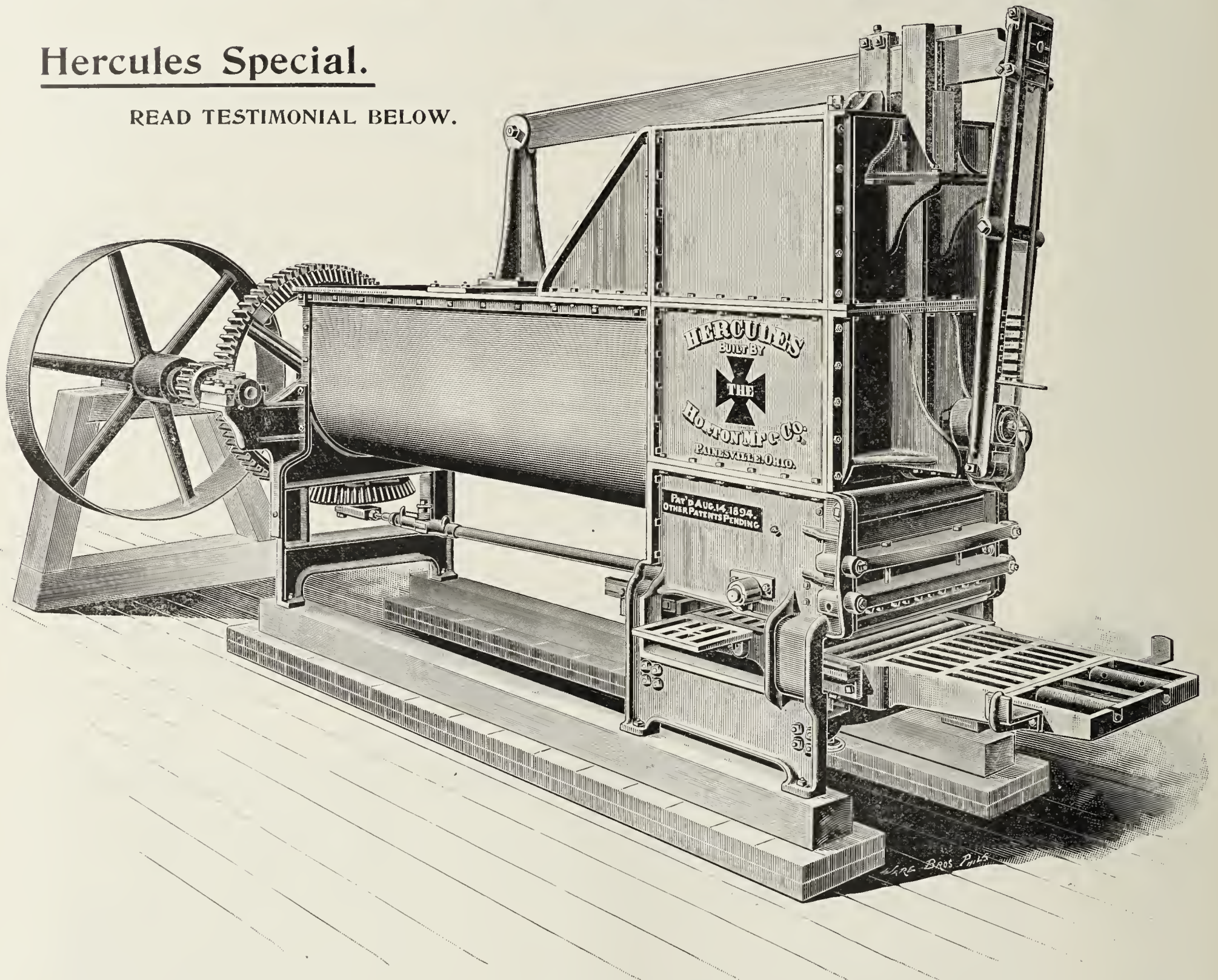


# Fire! Fire!! Fire!!!

## ⇒ Brick Machine.

### Hercules Special.

READ TESTIMONIAL BELOW.



BOLIVAR, PA., Sept. 9, 1898.

HORTON MANUFACTURING Co., Painesville, Ohio.

Gentlemen:—We are pleased to state that the Special Hercules Fire Brick Machine which you furnished us works to our entire satisfaction and we are well pleased with it.

Yours very truly,

REESE HAMMOND & Co.

Per J. B. HAMMOND, Supt.

**HERCULES No. 2** for Sand-Molded Brick. Weight 14,800 lbs. Capacity 40,000 to 50,000 in 10 hours.

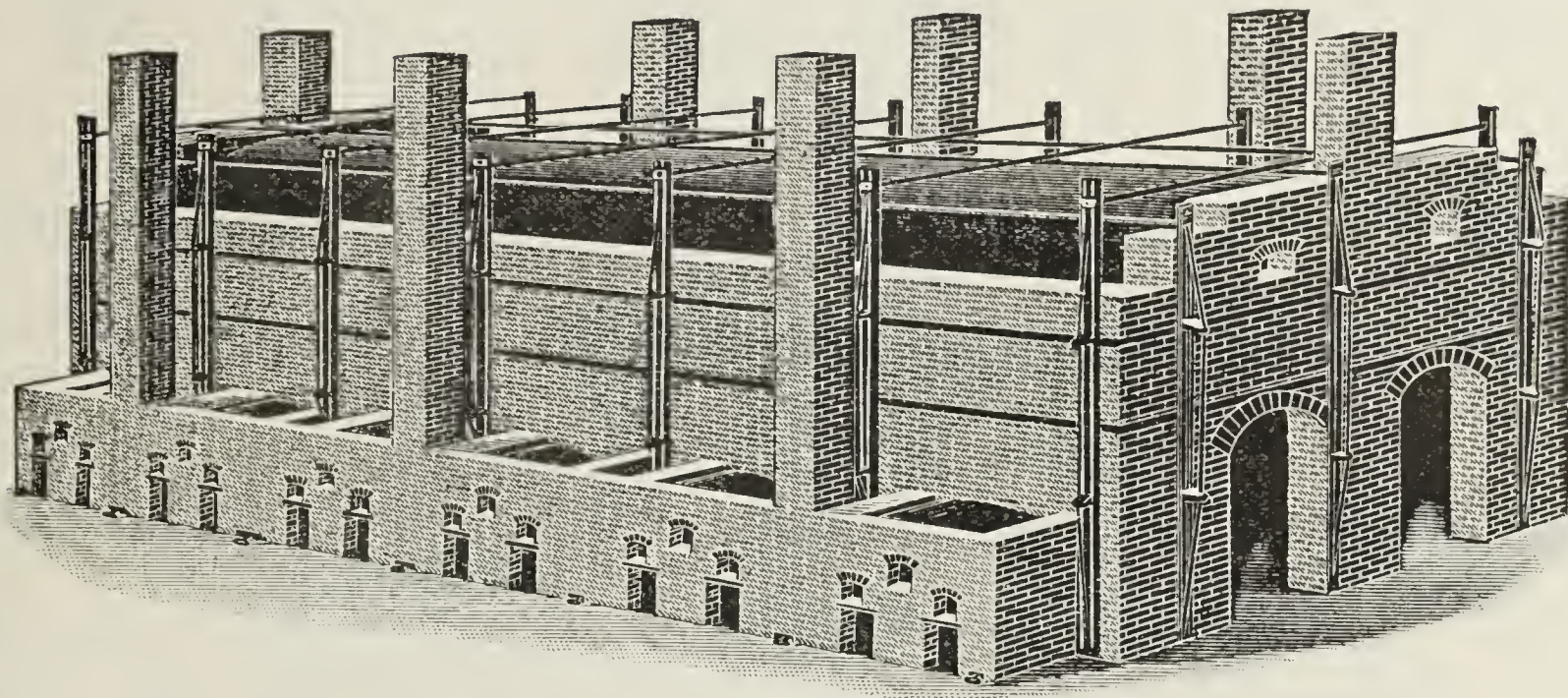
We make the largest line of Soft-Mud Machinery in the United States.

**The HORTON MANUFACTURING CO., Painesville, Ohio.**



# “One of the Greatest Inventions of Modern Times.”

F. W. BUTTERWORTH,  
Asst. Gen'l Man. Marion Brick Works.



## The Swift SLACK COAL COKING-TABLE Furnace Kiln.

THE KILN which has a solid bottom, which is much cheaper to begin with, and is always in repair.

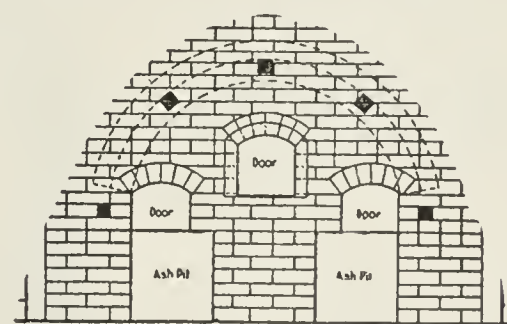
THE KILN that will save one ton of coal out of every seven tons you are using.

THE KILN which is so constructed that the heat is drawn from the bottom with Fan to dryer without danger of checking the cooling ware.

THE KILN that we will guarantee to burn any kind of clay ware with nothing but Slack Coal from start to finish of burn.

THE KILN that will burn Paving Brick in from 30 to 60 hours less time and not injure the ware, as the cold air is excluded from start to finish.

THE KILN that has the famous **Swift Coking-Table Furnace** attached to it; the furnace which is to-day being attached to all kinds of kilns—Up-draft, Clamp, Down-Draft, Round and Square, and also one continuous Kiln, has been re-modeled, and is giving entire satisfaction.



THE SWIFT COKING TABLE FURNACE.

### F. E. SWIFT,

Send for Catalogue.

Washington, Iowa, U. S. A.



OUR SPECIALTY IS

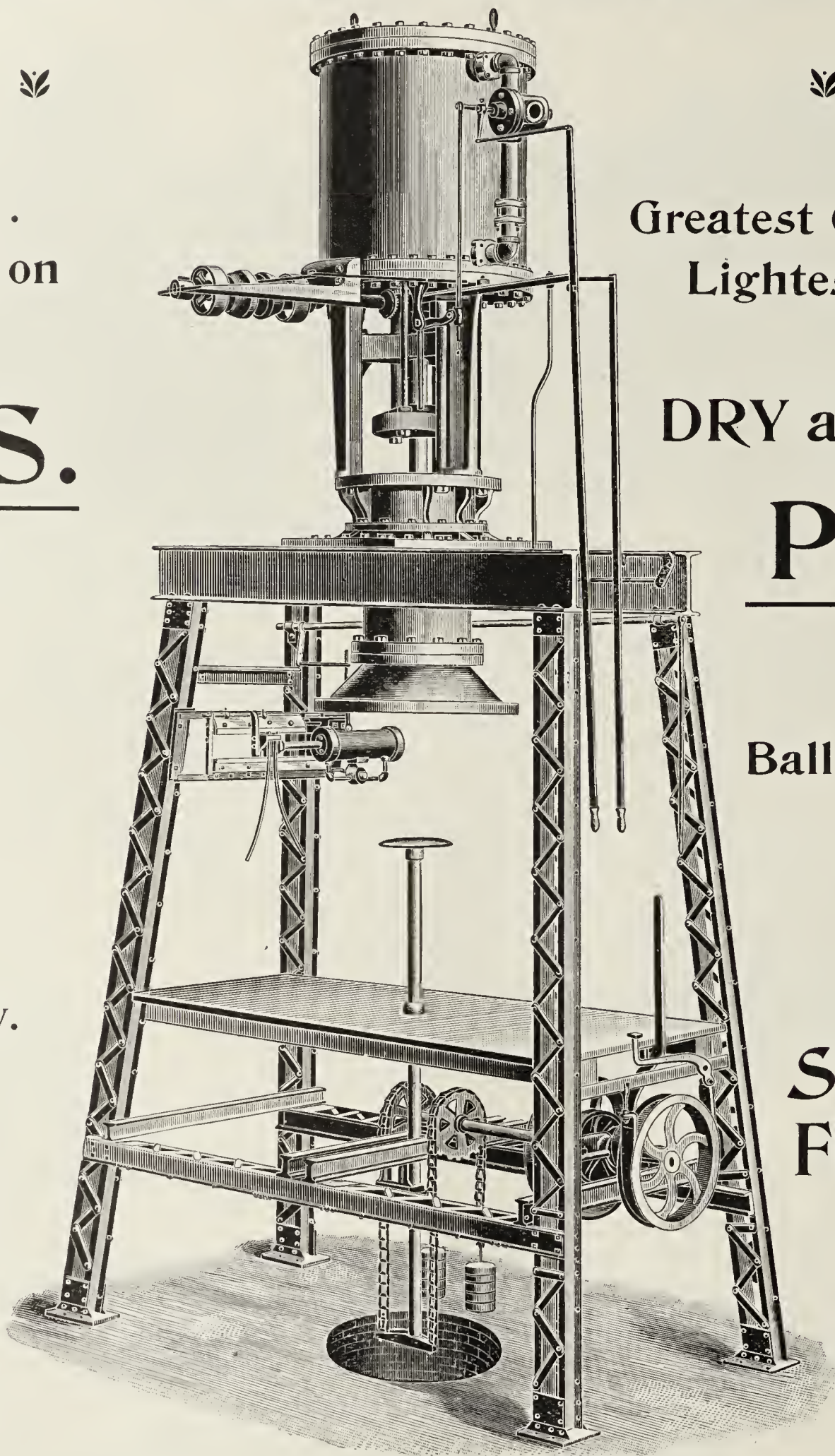
# Sewer Pipe Machinery.

We are . . .  
Authority on

DIES.

Write us  
For  
Pottery  
Machinery.

Latest  
Improved



Greatest Capacity,  
Lightest Running

DRY and WET  
PANS

WITH

Ball Bearing

STEP

AND

STEEL  
FRAMES.

Write us  
for Catalog

**SEWER PIPE AND TILE PRESS,**

MANUFACTURED BY

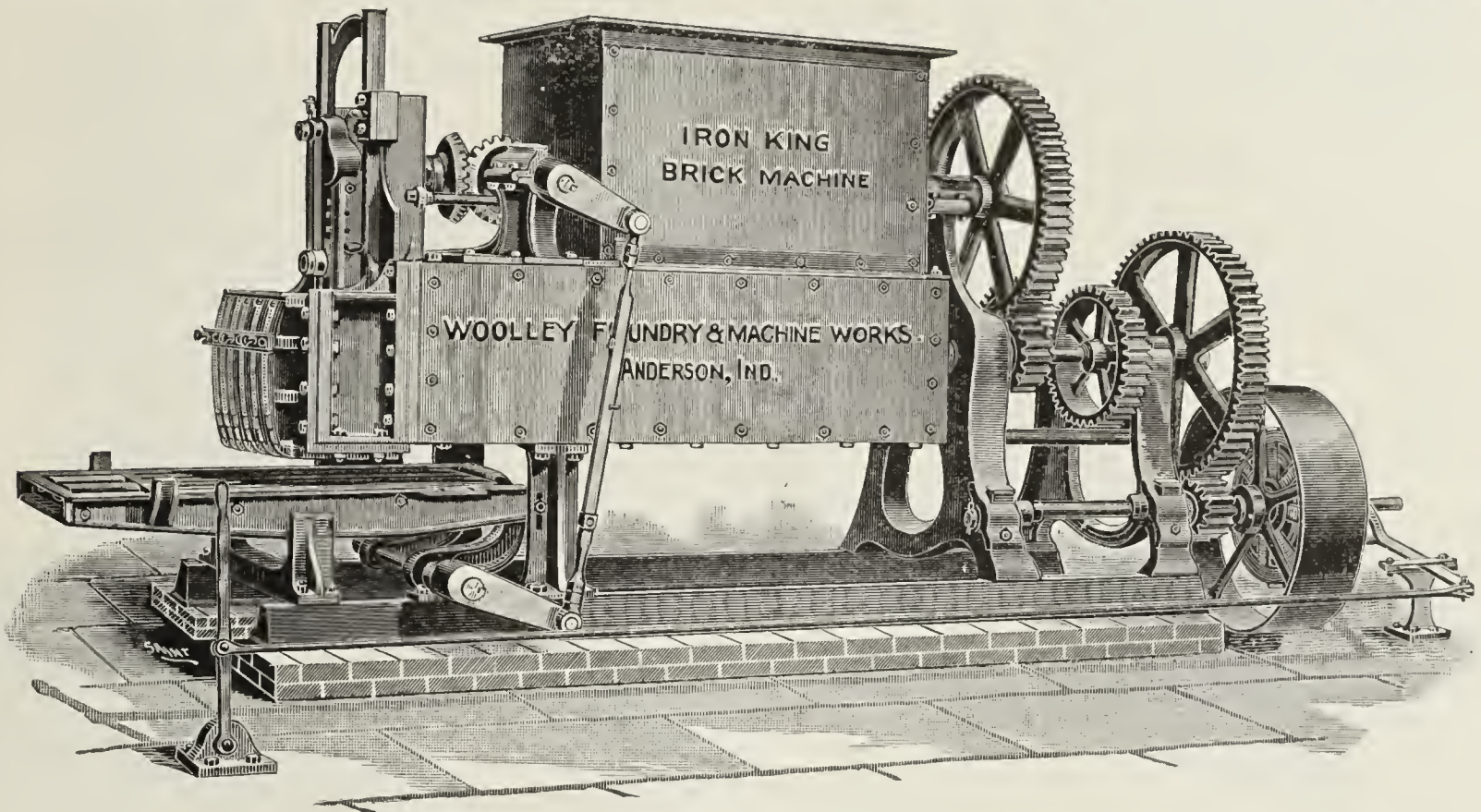
**TAPLIN, RICE & CO.,** AKRON,  
...OHIO.



# SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

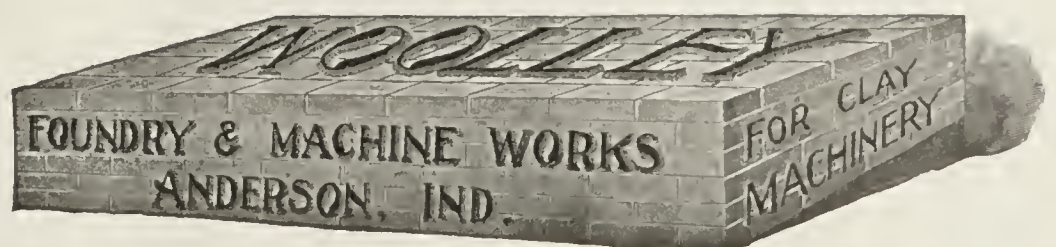
Our “**IRON KING**” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

**WOOLLEY** DRY PANS,  
PUG MILLS,  
SLIP PUMPS  
and PRESSES

Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US  
PLEASURE TO QUOTE  
YOU PRICES. . . .

Mention the Clay-Worker.





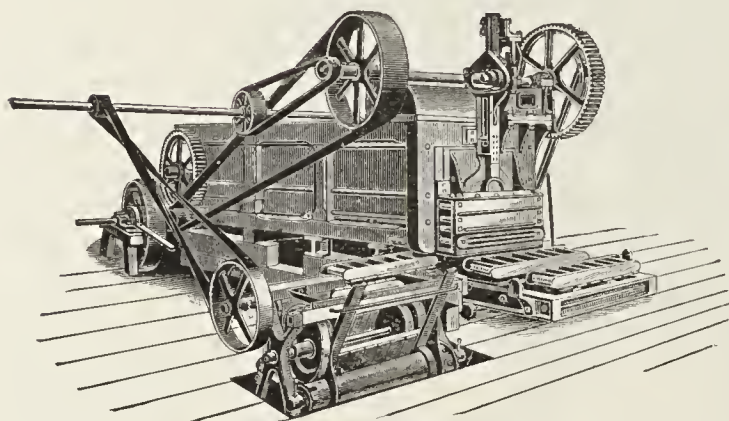
# DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

.. THE ..

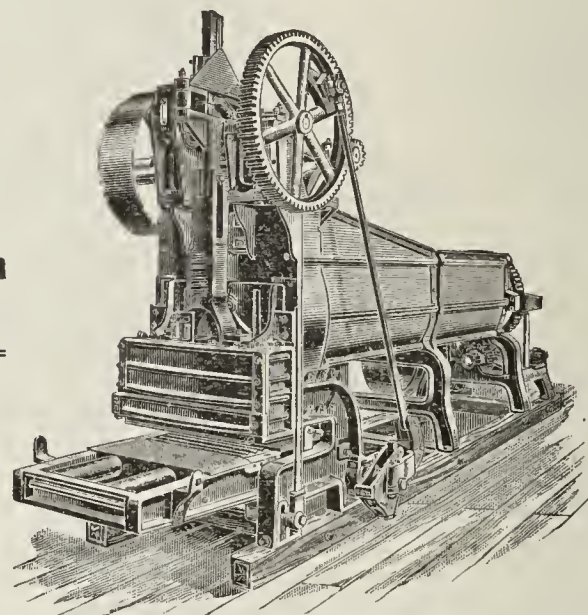
## POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

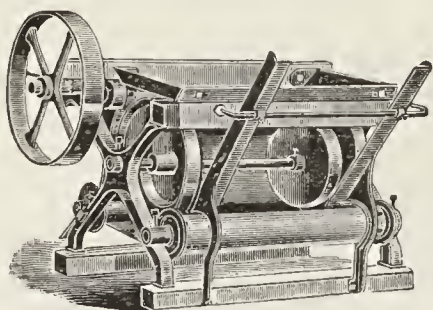
They have no equal  
for making Brick which  
have Clean, Sharp Cor-  
ners and Smooth  
Surfaces.



Iron Frame Pug Mill.

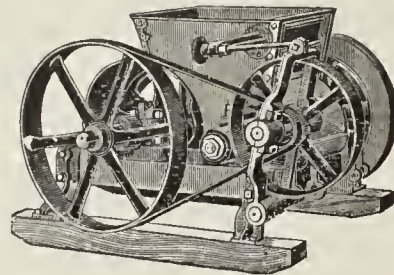
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



### Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



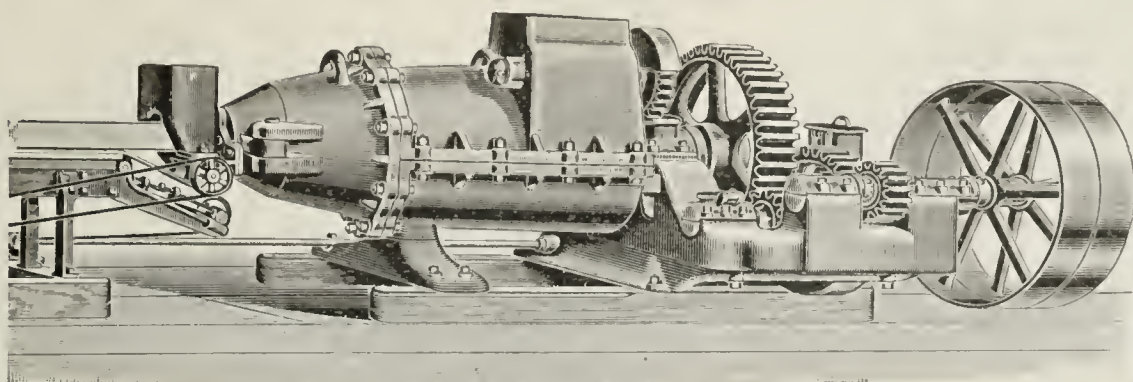
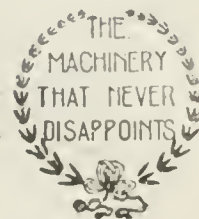
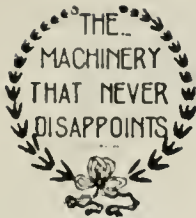
### Disintegrators,

Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

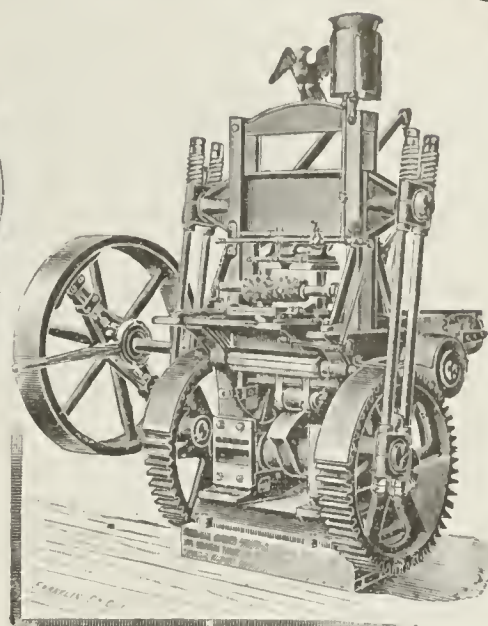
For terms and prices of anything needed on the brickyard write

**C. & A. POTTS & CO.,** 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**

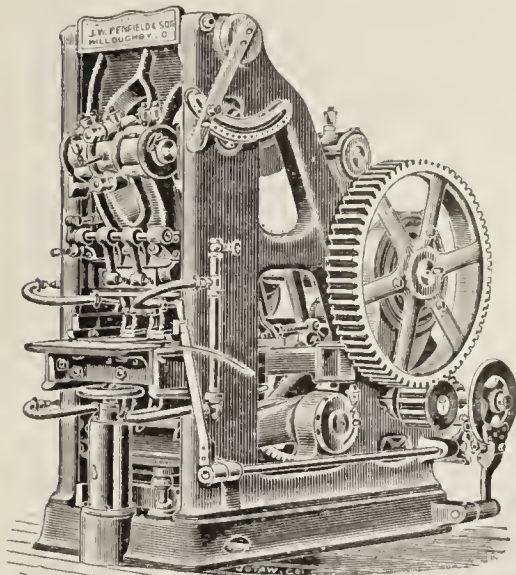




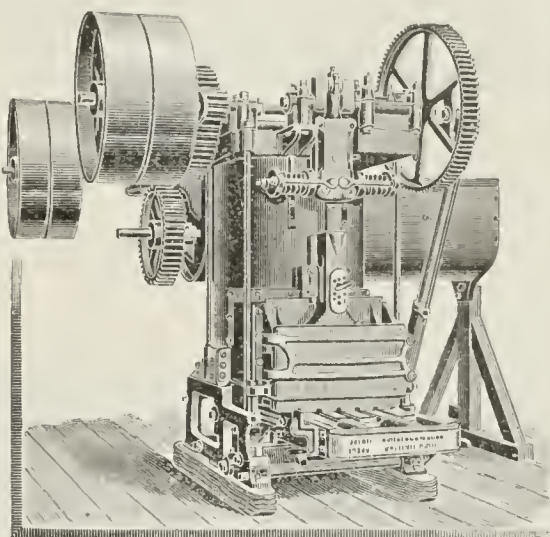
AUGER BRICK MACHINES.



REPRESSES, Double and Single Mold



DRY PRESS MACHINES.



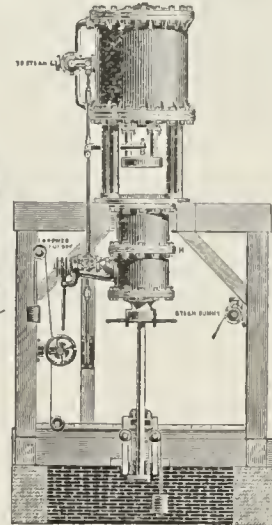
UPRIGHT STOCK BRICK MACHINES.

The Built Right,  
Run Right Line.

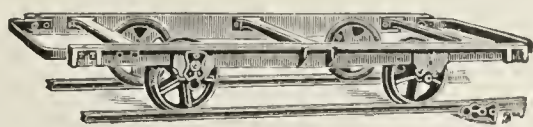
You don't pay for our mistakes because we have made every effort to guard against disappointments in our machinery and guarantee successful operation. Correct principles properly embodied in carefully constructed machinery have given our line an immunity to breaks and disappointments. We build them right, they run right. What more could you ask. Our line includes every machine and appliance for manufacturing and handling clay. A postal and a minute will bring you information about any or all of our line. Write to-day, to-morrow never comes.



COMBINED MACHINES, Double and Single Geared.



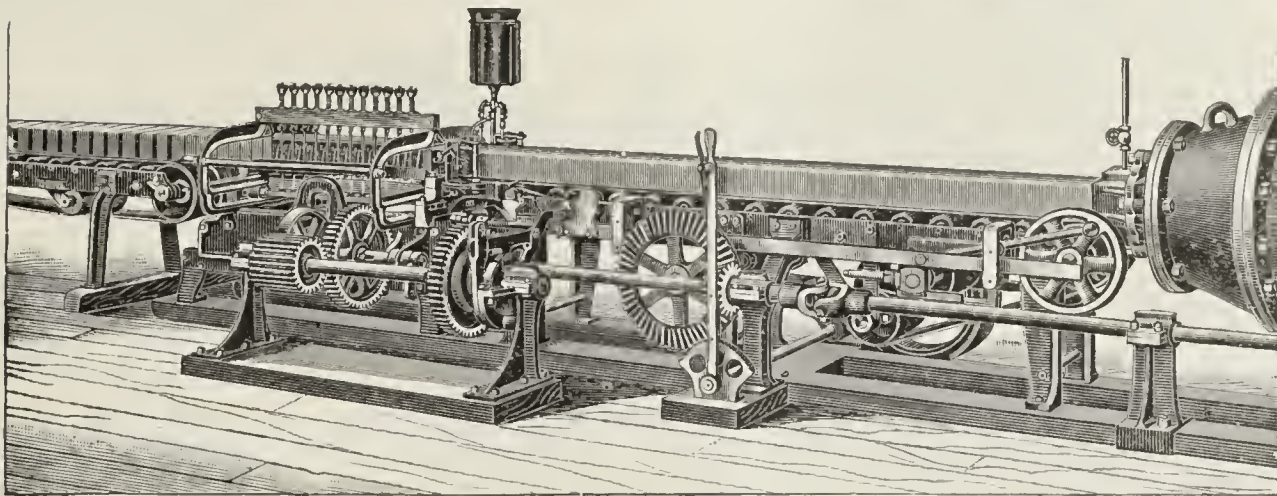
SEWER PIPE PRES



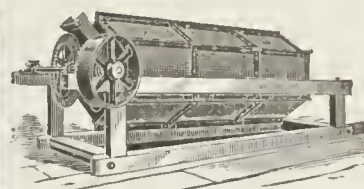
CARS.

The American Clay-  
Working Machinery Co.,

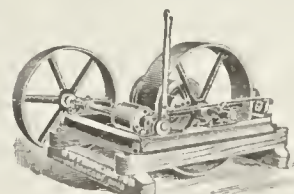
BUCYRUS OHIO, U. S. A.



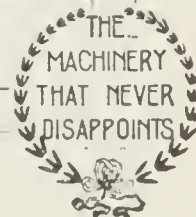
AUTOMATIC CUTTING TABLES, End and Side Cut.



SCREENS.

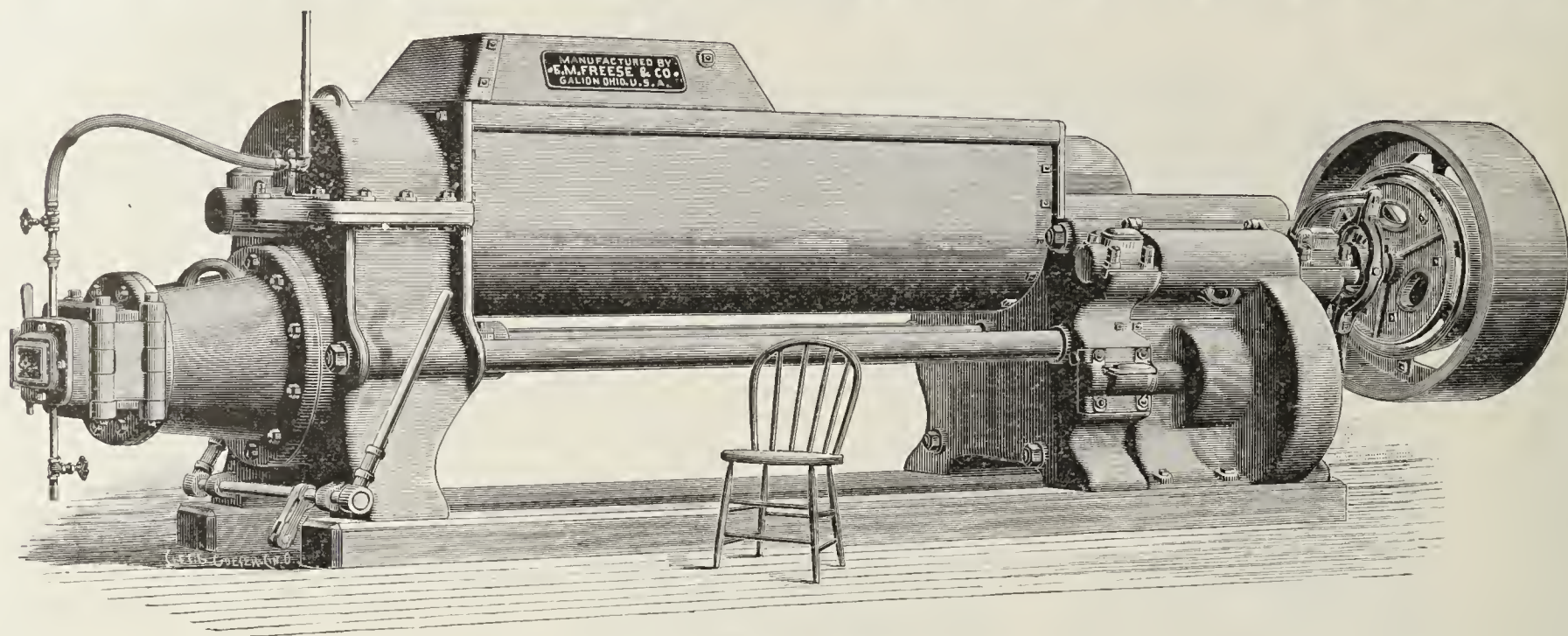


WINDING DRUMS.



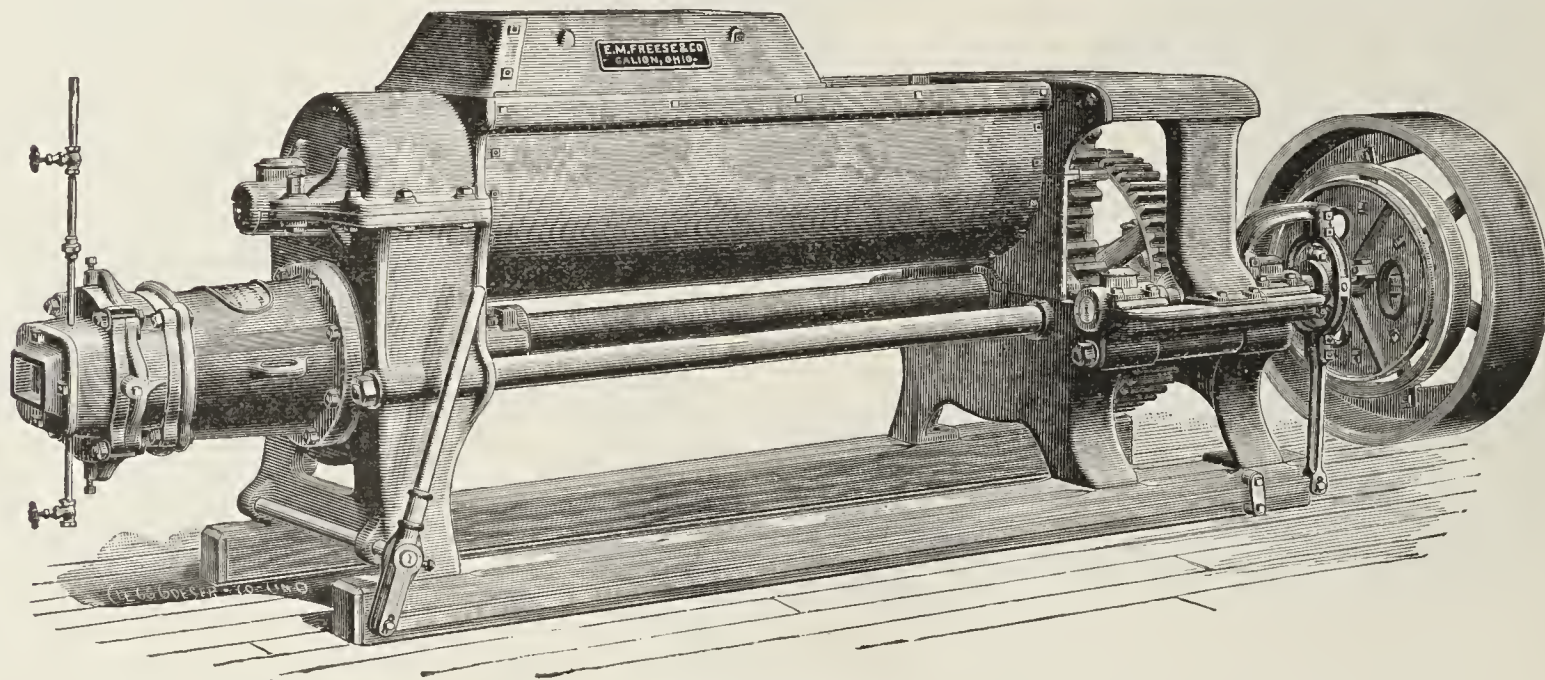


# The Original Union Brick Machines



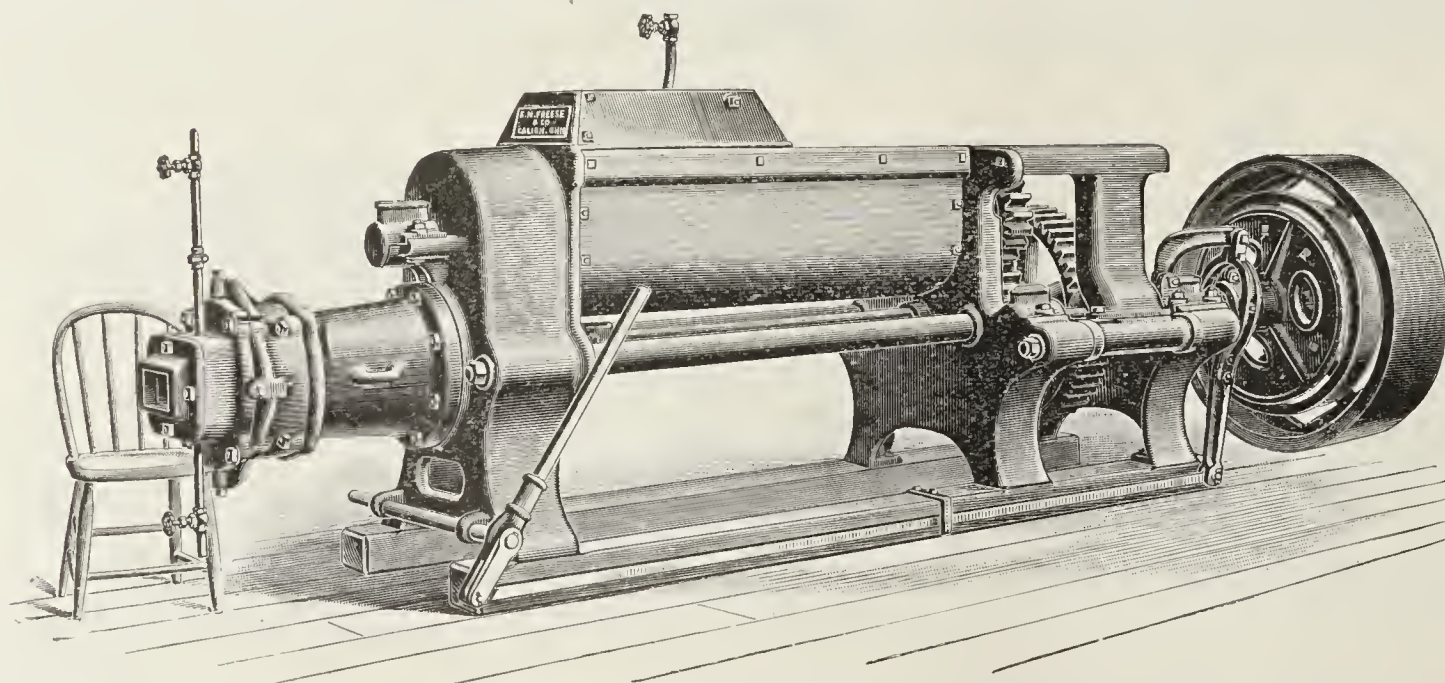
## SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



## No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



## No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

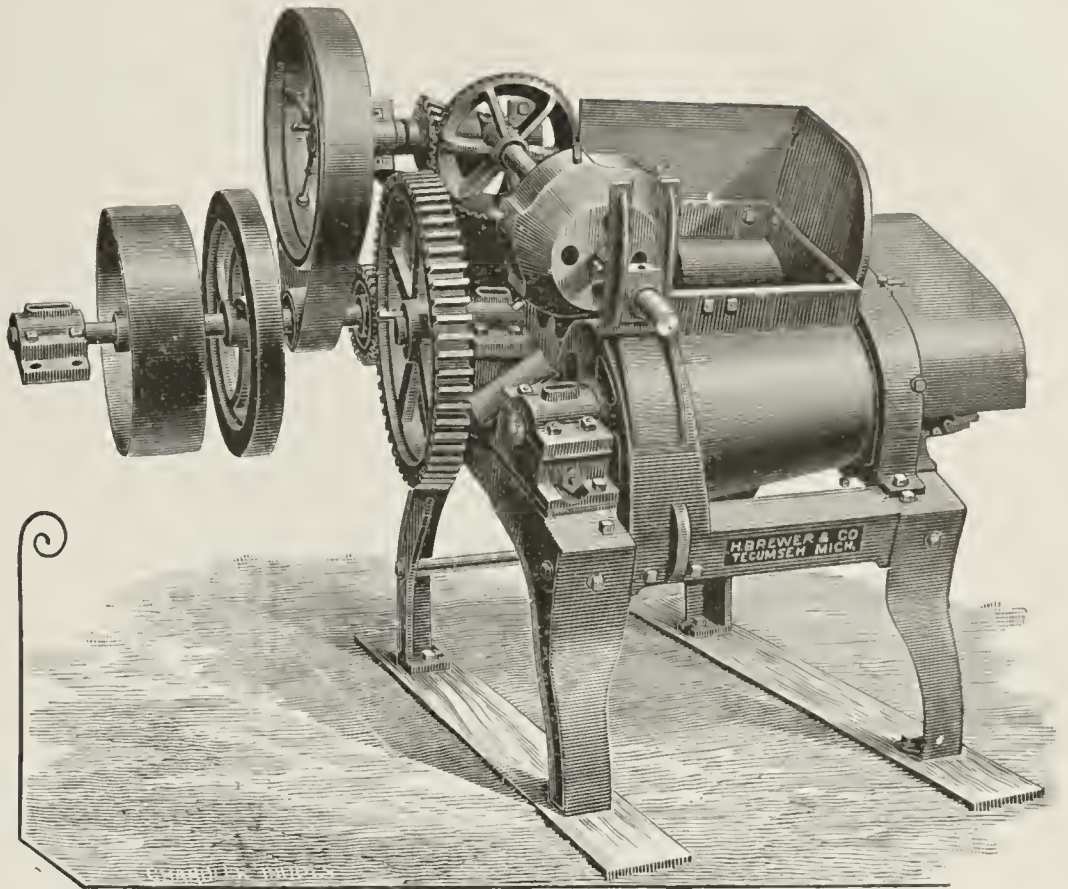
They are a SUCCESS Investigate them.

No separate Pug Mill required.

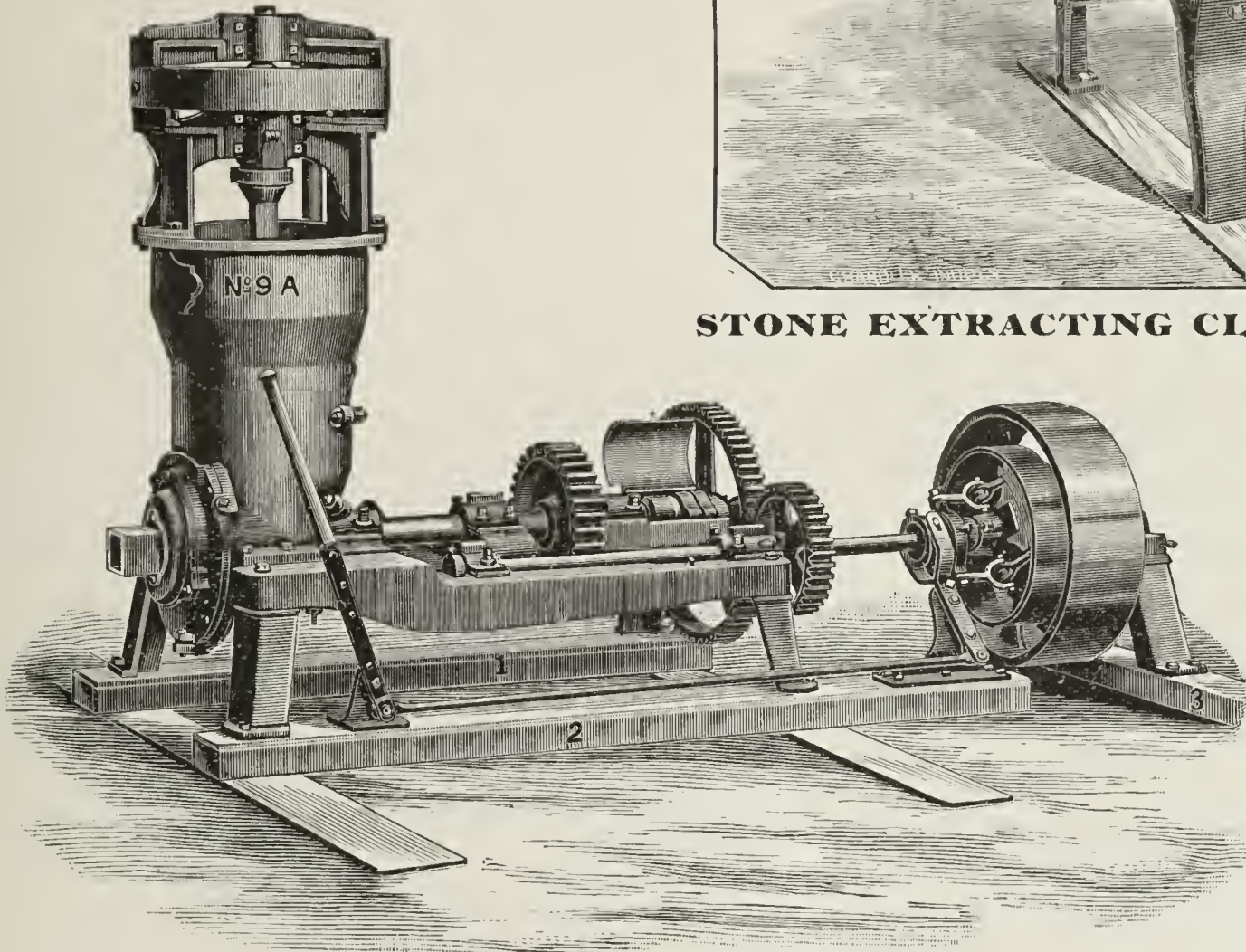
E. M. FREESE & CO., Galion, Ohio.



# Clay . . . . Working Machinery



STONE EXTRACTING CLAY CRUSHER.



No. 9 "A" BRICK MACHINE.

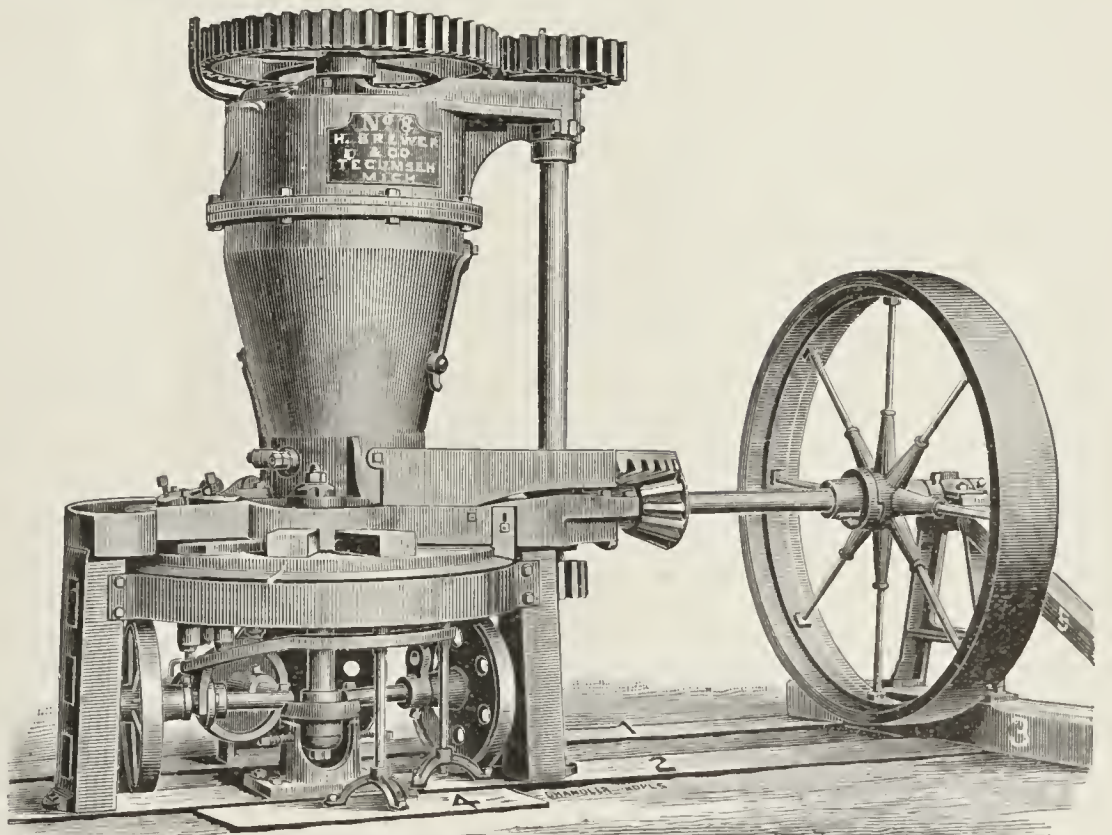
Complete  
Brick  
and  
Tile  
Outfits  
a Specialty.



Manufactured by

**H. Brewer  
& Co.,**

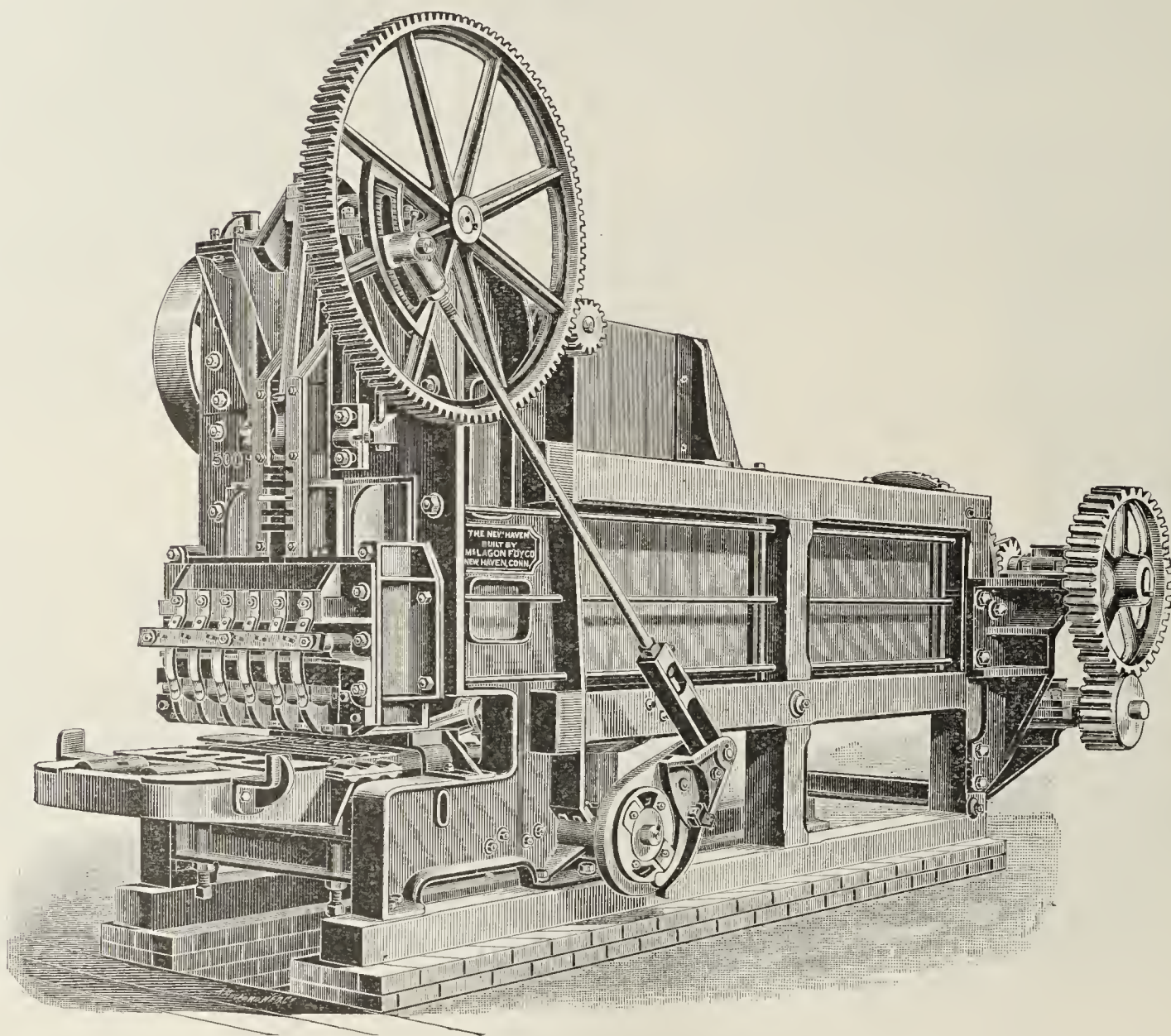
**TECUMSEH,  
. . . . MICH.**





# Another "New Haven" Record.

Three Seasons without Repairs,  
Except a few Tempering Knives.



HOLYOKE, MASS., October 18, 1898.

THE EASTERN MACHINERY CO., New Haven, Conn.

Dear Sirs:—In reply to your inquiry we can honestly say that your brick machine **has given entire satisfaction**, and we cheerfully recommend it to all brick manufacturers.

This is our **third season** with this machine and **we have had no repairs** except the furnishing of knives for shaft during this period.

Yours respectfully,

DANIEL O'CONNELL'S SONS.

We Have Received Lots of Just Such Replies.——

## The Eastern Machinery Co.,

NEW HAVEN, CONN.

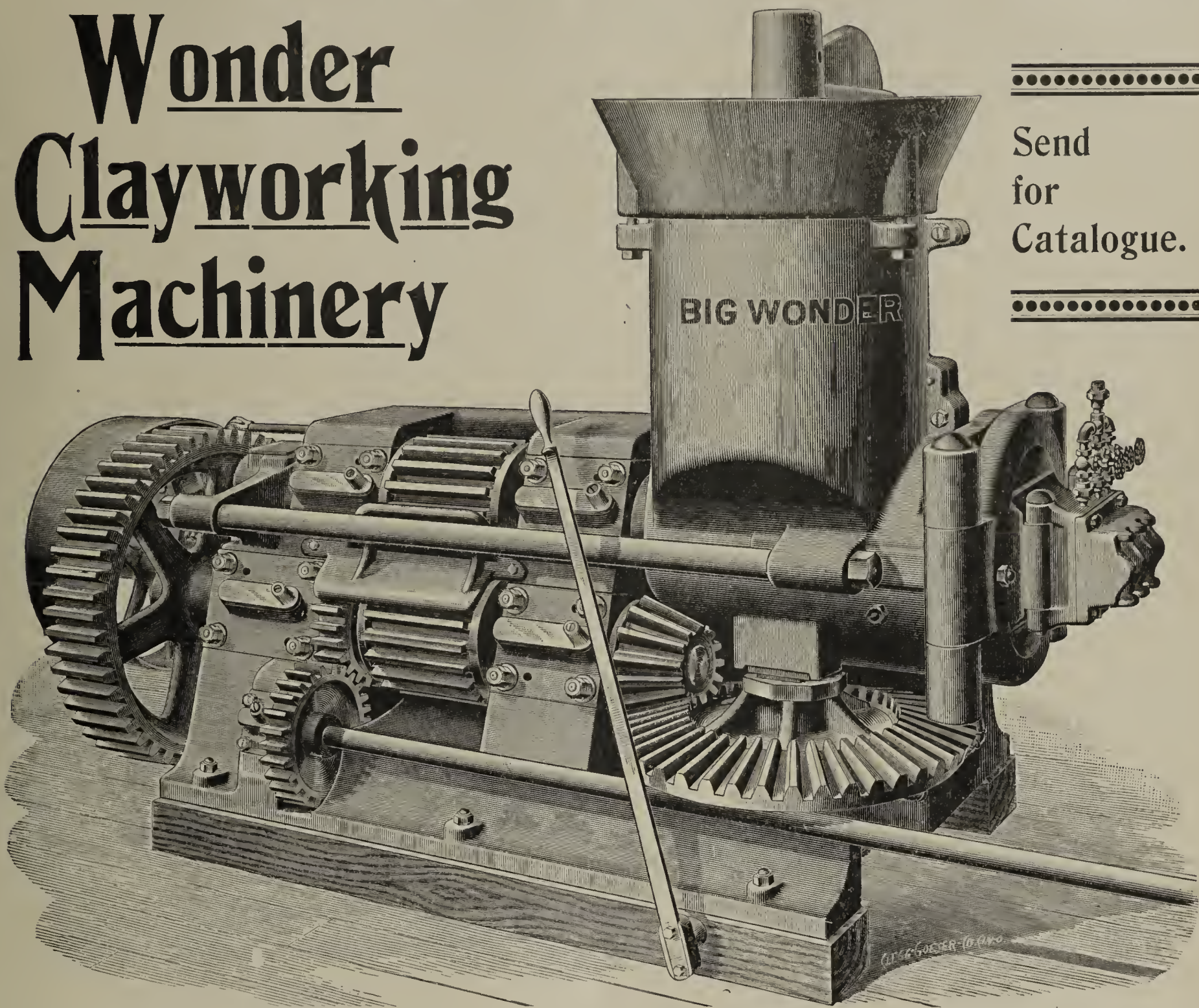


# What's in a Name?

A GREAT DEAL IF A THING BE WELL AND TRULY NAMED AND THIS IS TRUE OF

# Wonder Clayworking Machinery

Send  
for  
Catalogue.



WHICH is so called because it has proven by actual work in various kinds of clays to have a **Wonderful** capacity, both for quantity and quality. It has a **Wonderful** pugging and tempering capacity and produces a **Wonderfully** strong brick, free from laminations, and in connection with our new automatic cutting table a **Wonderfully** straight, true brick is made of almost any clay. It is this **Wonderful** quality that enables our machinery to work successfully some clays which other auger machines can not work at all satisfactorily. This fact has been demonstrated time and time again. The users of **WONDER MACHINERY** all testify that it is well worthy of the name. They have demonstrated that it has **Wonderful** wearing qualities for which reason it is, in the long run, the best and cheapest machinery on the market.

It will afford us pleasure to send you testimonial letters attesting these facts and quote prices on individual machines or complete plants.

## Wallace Manufacturing Co.,

CHICAGO AGENTS:

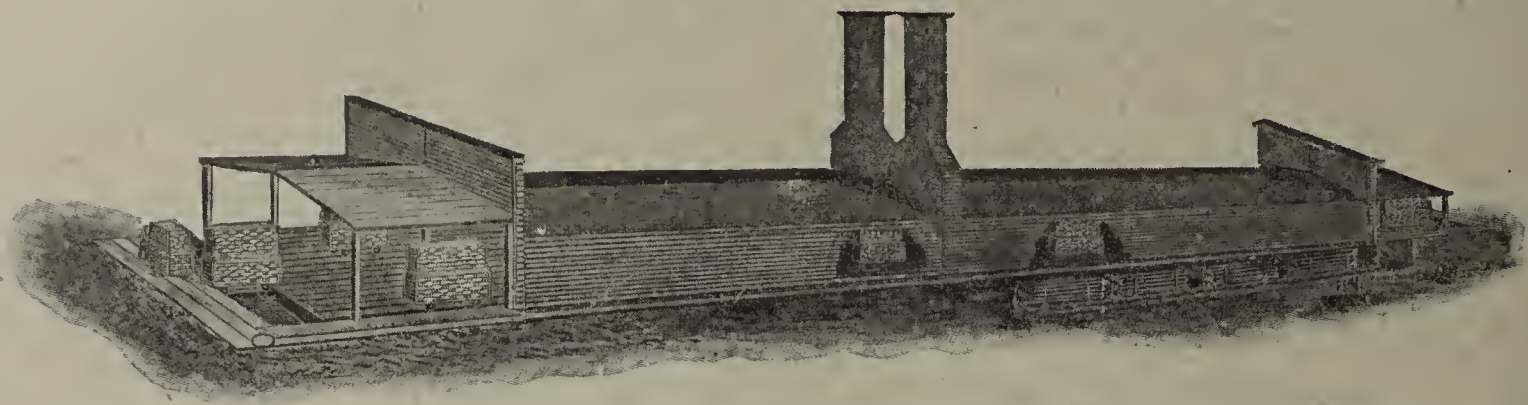
CHICAGO BRICK MACHINERY CO., Chicago, Ill.

Frankfort, Indiana.



**A. F. BARRON,** Patentee and  
Builder of

# The Chicago Iron Clad Dryer and Barron's Tender Clay Dryer.



THE BARRON TENDER CLAY DRYER.

This is a practical arrangement for drying all tender clay products that requires very careful drying. Each tunnel is divided into two chambers, the front being the preparatory, or tempering room, the rear the finishing chamber.

The air of tempering room can be maintained at any desired temperature and impregnated with necessary moisture to hold texture of clay products in uniform condition from centre to surface while process of setting, solidifying and warming up is progressing—preparatory for finishing course through rear chamber.

**A. F. BARRON.**

Successor to WOLFF DRYER CO.,

Room 303, 358 Dearborn Street,

CHICAGO, ILL.

# The "A. B. C." Brick Dryer.



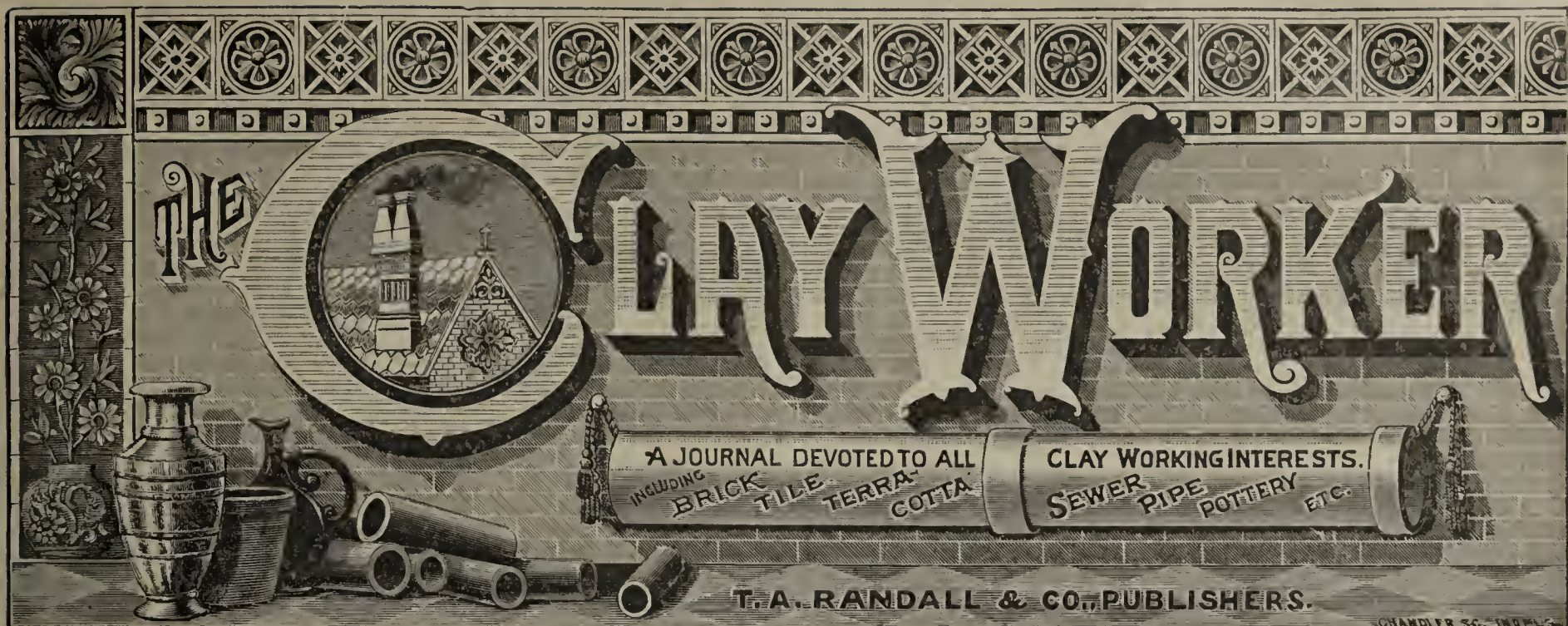
Send for Catalogue.

Reese, Hammond & Co., Bolivar, Pa., write:

"Your esteemed favor of 15th inst. is received, and we are glad to know that Mr. Palmer has made such a good report on our dryer. We will secure photograph for you in a short time and be pleased to send it. We have spared no trouble or expense to make this a first-class building, believing that we had the best system of drying that we have seen, and we are glad to state that our expectations as to your system have been fully realized, and we shall be only too glad to furnish you with a photograph or any other information that you may desire from time to time."

**AMERICAN  
BLOWER  
COMPANY,  
DETROIT.**





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX, No. 6

INDIANAPOLIS, IND., DECEMBER, 1898.

\$2.00 a Year in Advance.

# Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.

C. P. MERWIN BRICK CO.

MANUFACTURERS OF

BUILDING, PALLET FACE, SEWER and PAVING BRICK.

BERLIN, CONN., Dec. 3rd, 1898.

MR. J. H. CHAMBERS, General Manager,  
Chambers Bros. Co.,

DEAR SIR:—Well, the brickmaking season of 1898 is over with us, having just finished burning the last kiln. The machine you put in for us in the Spring of 1897 has done excellent work, and by increasing the speed of machine, we have increased the output very much, without any detriment to quality, or any hardship on the machine. No use talking, when buying a machine to make brick, buy one that is built to run every day, and you will have no regrets. I speak this way for we came near giving the above order to another party, through difference in price. From what we have seen and heard about other makes of stiff mud machines, we are glad we bought "The Chambers."

Wishing you and your Company the compliments of the season so near at hand,  
we are

Yours truly,

C. P. MERWIN BRICK CO.,  
ELLIOTT S. MORSE, Man.

## Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,  
171 South Canal Street.

PHILADELPHIA, PA.



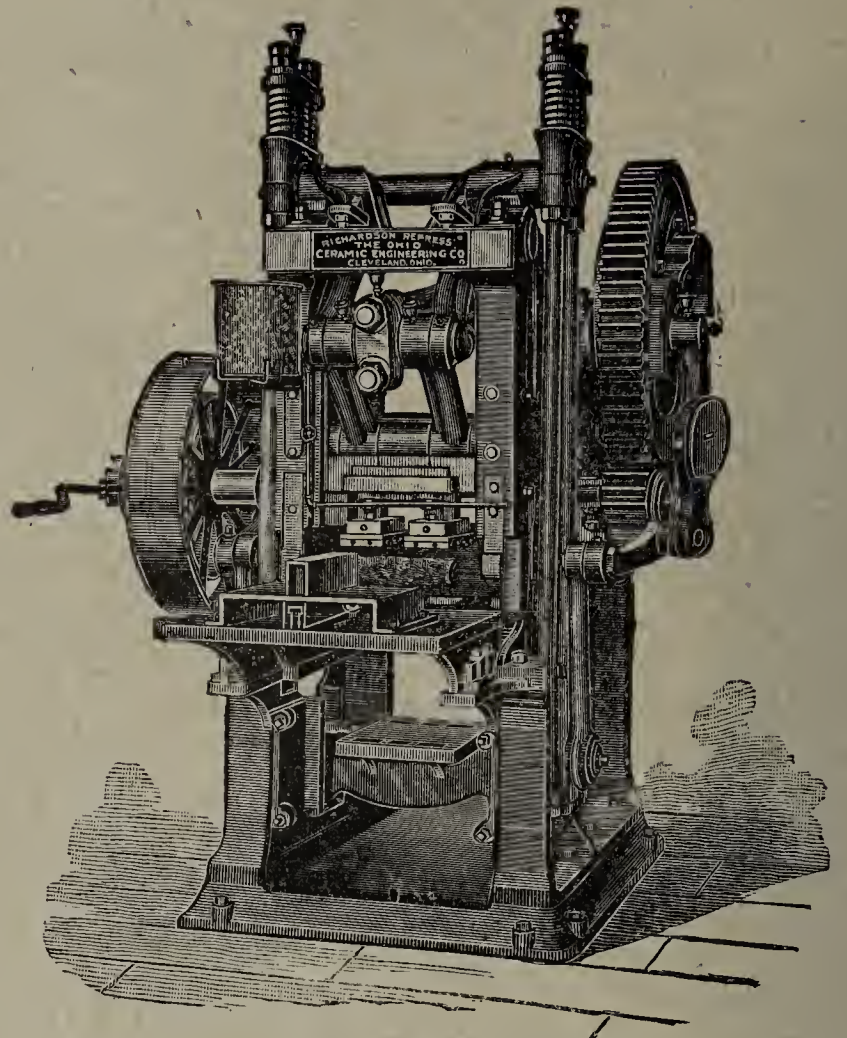
"GOOD WORKS ARE DONE BY THOSE WHO WISH TO LEARN."

• • •

WE DON'T know everything about the Art of Brickmaking—for it is certainly one of the modern arts—but we do know SOMETHING about it and are making improved machinery and methods a constant study.

Our Catalogue may glve you some suggestions, we will send you one if you wish.

The OHIO CERAMIC ENGINEERING CO.,  
Cleveland, Ohio.



The RICHARDSON REPRESS.

## INDEX TO ADVERTISERS.

### Brick Machinery—Dry Press Process.

| Name.                                   | Page. | Name.                                    | Page. |
|-----------------------------------------|-------|------------------------------------------|-------|
| American Clay Working Mach Co, The..... | 499   | Progress Press Brick and Machine Co..... | 475   |
| Chisholm, Boyd & White Co, The          | 424   | Ross-Keller Brick Machine Co.            | 429   |
| Fernholtz Brick Press Co, The.          | 428   | Simpson Brick Press Co .....             | 425   |

### Brick and Tile Machinery.

|                                            |          |                                         |          |
|--------------------------------------------|----------|-----------------------------------------|----------|
| American Clay-Working Mach Co., The.....   | 499      | Horton Mfg Co, The.....                 | 496      |
| Anderson Foundry and Mach. Works.....      | 488      | Huetteman & Cramer Co, The..            | 489      |
| Baird and Son; H. C.....                   | 480      | Kells & Sons .....                      | 480      |
| Battenfeld-Morgan Co., The.....            | 426, 427 | Leader Mfg. Co, The.....                | 490      |
| Brewer, H. & Co .....                      | 501      | Madden & Co.....                        | 485      |
| Chambers Brothers Co.....                  | 421, 490 | Ohio Ceramic Engineering Co., The.....  | 422      |
| Chicago Brick Machinery Co... 475          |          | Potts & Co., C. & A.....                | 497      |
| Drake Standard Mach. Wks.... 478           |          | Raymond & Co., C. W.....                | 469      |
| Eastern Machinery Co, The.... 502          |          | Steele, J. C., & Son.....               | 487      |
| Fate & Co., The J. D.....                  | 500      | Taplin, Rice & Co.....                  | 494      |
| Freese, E. M. & Co .....                   | 500      | Wallace Mfg. Co, The.....               | 473, 503 |
| Henry Martin Brick Mach. Mfg Co, The ..... | 481, 489 | Wellington Machine Co, The... 471       |          |
| Hensley, J. W.....                         | 423      | Wiles Co., A. M. & W. H .....           | 487      |
|                                            |          | Woolley Foundry and Machine Works ..... | 498      |

### Brick Kilns and Dryers.

|                                |     |                                |     |
|--------------------------------|-----|--------------------------------|-----|
| Alsip, S. H .....              | 486 | Morrison & Co., R. B .....     | 491 |
| American Blower Co, The.....   | 504 | Martin Dryer Co.....           | 479 |
| Barron, A. F.....              | 504 | Phillips, S. G.....            | 479 |
| Carson, J. W.....              | 482 | Pike, E. M.....                | 479 |
| Eudaly, W. A .....             | 491 | Reppell, L. H .....            | 486 |
| Fernholtz Brick Press Co, The. | 428 | Standard Dry Kiln Co, The..... | 430 |
| Haigh, H.....                  | 492 | Swift, F. E.....               | 493 |
| Lehmann & Co, F.....           | 492 | Yates, Alfred.....             | 480 |

### Brick Yard Supplies.

|                                              |          |                                                 |     |
|----------------------------------------------|----------|-------------------------------------------------|-----|
| Atlas Bolt & Screw Co, The.....              | 482      | Jeffrey Manufacturing Co, The.                  | 485 |
| Caldwell & Son Co., H. W.....                | 483      | Marion Steam Shovel Co.....                     | 488 |
| Carmichael, T. W.....                        | 480      | Main Belting Co .....                           | 478 |
| Carnell, Geo.....                            | 486      | Mershon & Co., W. B .....                       | 483 |
| Coldewe & Co., G.....                        | 478      | Mey, F. H. C.....                               | 482 |
| Elder & Dunlap.....                          | 481      | Newton, A. H.....                               | 485 |
| Frost Engine Co .....                        | 495      | Phillips & McLaren .....                        | 484 |
| Harrington & King Perforating Co, The .....  | 423      | Pittsburg Mineral Screen Company, The .....     | 481 |
| Henry Martin Brick Machine Mfg. Co, The..... | 481, 489 | Stedman's Machine Works.....                    | 487 |
| Horton Mfg. Co, The.....                     | 496      | Williams Patent Crusher and Pulverizer Co ..... | 480 |

### Miscellaneous.

|                                                 |     |                                            |          |
|-------------------------------------------------|-----|--------------------------------------------|----------|
| Associated Trade & Industrial Press.....        | 483 | Indianapolis Engraving and Electro Co..... | 483, 485 |
| Big Four R. R.....                              | 482 | Indiana, Decatur & Western ...             | 484      |
| Cincinnati, Hamilton & Dayton R. R .....        | 484 | Illinois Central R. R .....                | 482      |
| Chesapeake & Ohio R. R.....                     | 485 | Lake Erie & Western.....                   | 485      |
| Clinton Paving and Building Brick Co., The..... | 476 | Many, F. B.....                            | 478      |
| Coaldale Brick and Tile Co., The                | 476 | McAvoy Vitrified Brick Co ...              | 477      |
| Cotton Belt Route.....                          | 485 | Monon Route .....                          | 484      |
| Des Moines Brick Manufactur- ing Co., The.....  | 476 | Munn & Co.....                             | 482      |
| Dean Bros. Steam Pump Works                     | 484 | Osborne, W. R.....                         | 480      |
| Dover Fire Brick Co.....                        | 483 | Philadelphia Commercial Museum, The.....   | 481      |
| Evans & Howard .....                            | 479 | Purinton Paving Brick Co, The              | 477      |
| Gabriel & Schall.....                           | 480 | Rockwood Mfg. Co, The.....                 | 484      |
| Geysbeek, S.....                                | 484 | St. Louis Terra Cotta Co.....              | 481      |
| Henry Carey Baird & Co.....                     | 479 | Tennille, A. F.....                        | 481      |
| Indiana Bermudez Asphalt Co.                    | 476 | Vandalia Line .....                        | 483      |
|                                                 |     | VanDuzen Co, The E. W.....                 | 484      |
|                                                 |     | Wabash Railroad.....                       | 483      |
|                                                 |     | Small Ads., Wanted, For Sale, etc.         |          |

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**THE HARRINGTON & KING PERFORATING CO.**  
CHICAGO, ILL.

**THE H. & K. P. CO.**  
PERFORATED SHEET STEEL  
FOR  
**CLAY SCREENS**

SEWER PIPE  
BRICK  
FOR CHUTE  
SCREENS.  
TERRA-COTTA  
FOR REVOLVING  
SCREENS.  
DRY PAN  
SCREENS.

Eastern Office: No. 284 Pearl Street,  
NEW YORK.

General Office and Works: No. 231 North Union St.  
CHICAGO, ILL., U. S. A.

# The MONARCH

Is an All Iron and Steel Brick Machine with

Double  
Pug Mill.

...

SIMPLE  
IN CON-  
STRUCTION,  
DURABLE  
AND . . .  
POWERFUL.

...

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new IRON QUAKER. Engines and boilers. Send for 1898 Catalogue.

**JAMES W. HENSLEY,** Successor to S. K. FLETCHER, Indianapolis, Ind.

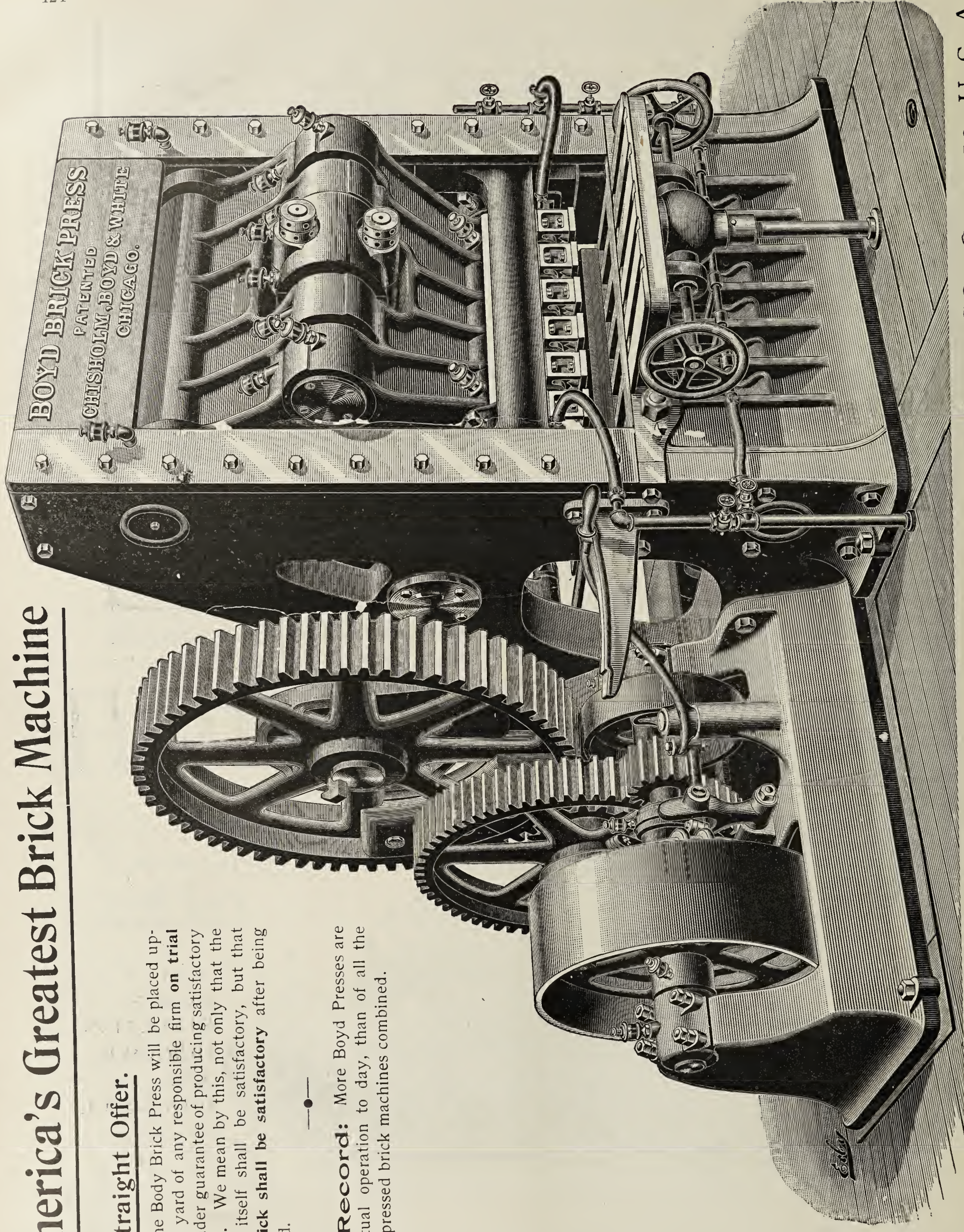


# America's Greatest Brick Machine

## A Straight Offer.

The Body Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

**Its Record:** More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,  
57th and Wallace Streets.

CABLE ADDRESS:  
"CHISHOLM, CHICAGO"  
A. B. C. CODE USED

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.



# The Survival of the Fittest.

THE inexorable law of the "Survival of the Fittest" is well illustrated in the continued success of the **SIMPSON BRICK PRESS**. It was one of the first successful dry presses manufactured in America and from its introduction has held a leading place. The improved **SIMPSON PRESS** is a thoroughly up-to-date machine and embodies many excellent features, that make it invaluable to the brickmaker who wishes to make the best quality of Press Brick—at moderate cost.

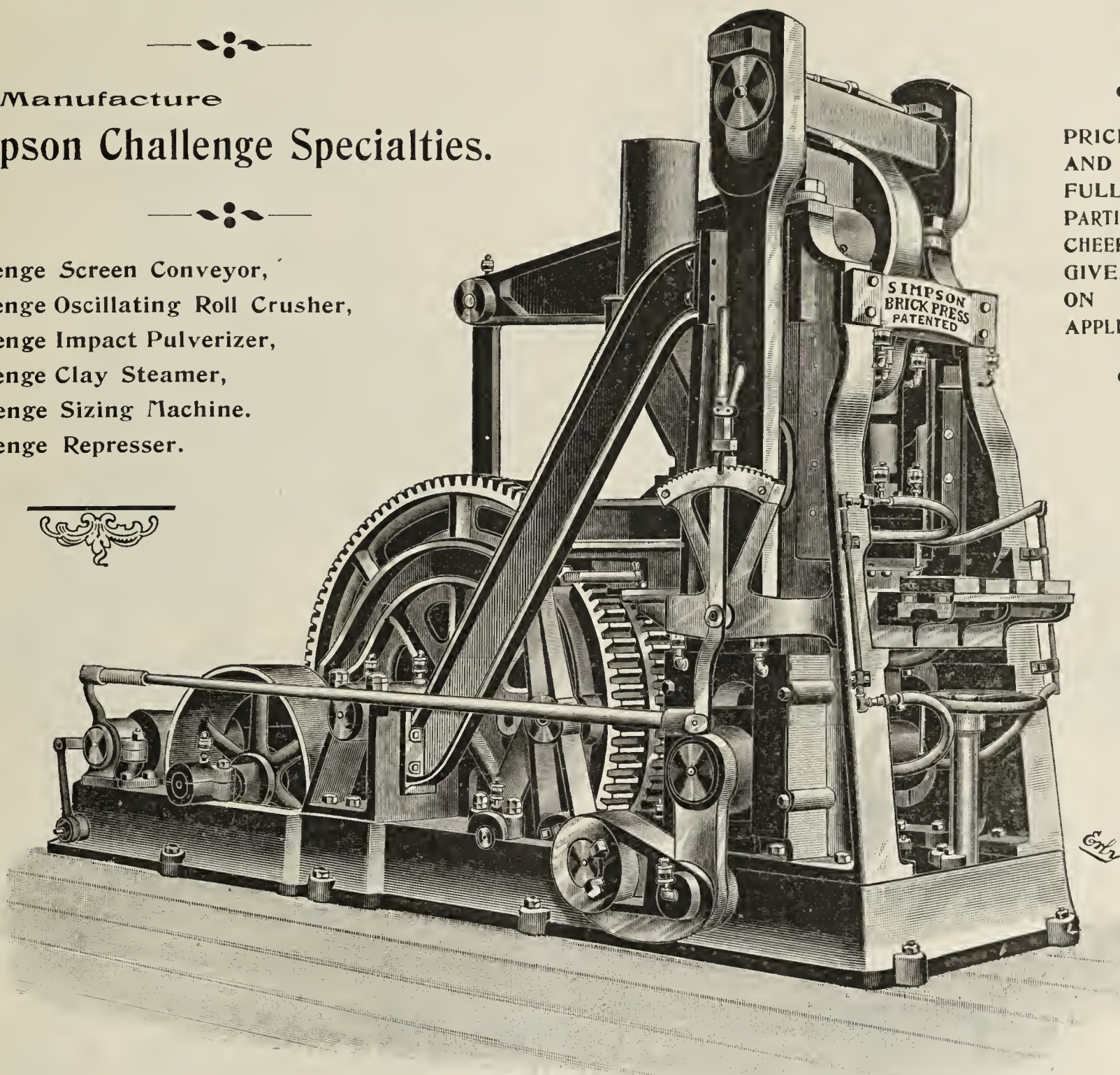
We make a specialty of complete equipments including every device required on a modern press brick plant. Don't fail to get a list of our new improved Challenge Clay Preparing Machinery.

We Manufacture

Simpson Challenge Specialties.

Challenge Screen Conveyor,  
Challenge Oscillating Roll Crusher,  
Challenge Impact Pulverizer,  
Challenge Clay Steamer,  
Challenge Sizing Machine.  
Challenge Represser.

PRICES  
AND  
FULL  
PARTICULARS  
CHEERFULLY  
GIVEN  
ON  
APPLICATION.



Simpson's 4-Mold Brick Press, Model AA, New Style. BUILT IN 4 SIZES.

**SIMPSON MACHINERY CO.,**

OFFICE AND WORKS: 77th and Jackson Ave. (FORMERLY STORMS AVE.)  
Grand Crossing, Ill.

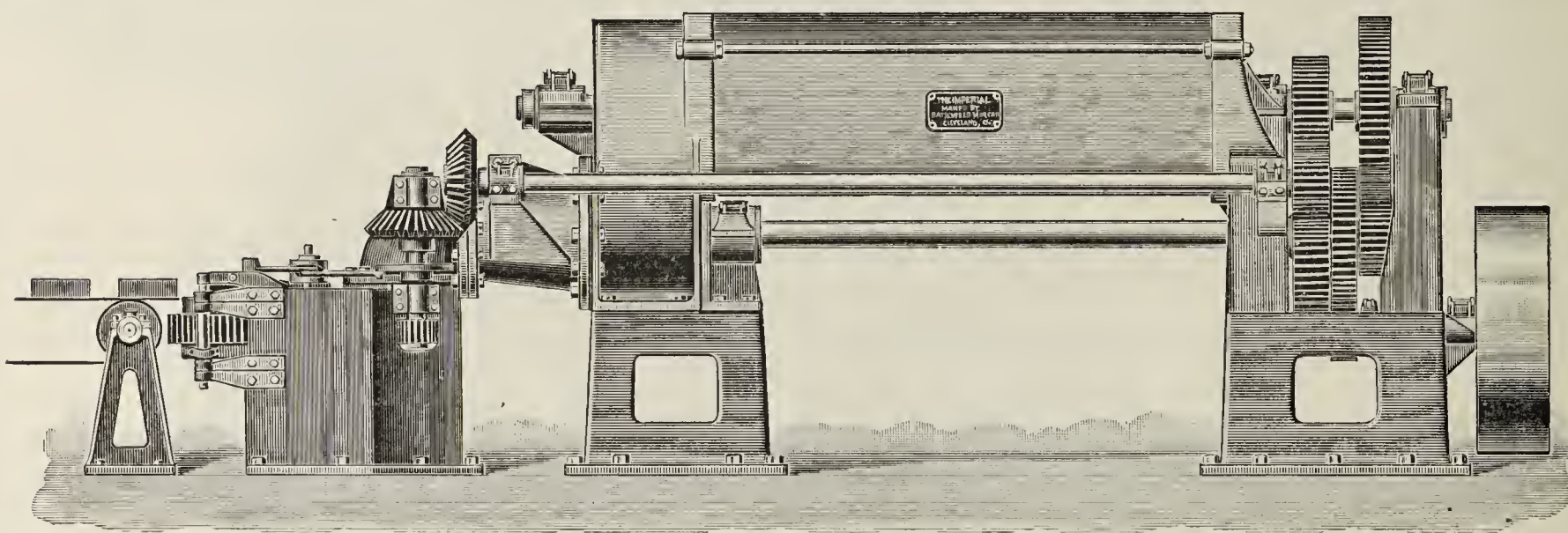
CHICAGO.



# "The World Revolves"

But Our New Imperial Brick Machine is Ahead of It. . . . .

We take pleasure in bringing before the Brickmakers, our New and Perfect Brick Machine illustrated here. We feel justified in our claim that this machine has no equal, and will accomplish under one operation, at a less cost, a more perfect brick than any other Stiff Mud Machine ever produced.



The Imperial Brick Machine.

If you are interested in a perfect Brick Machine, write to us for descriptive matter, and catalogue. We solicit your correspondence.

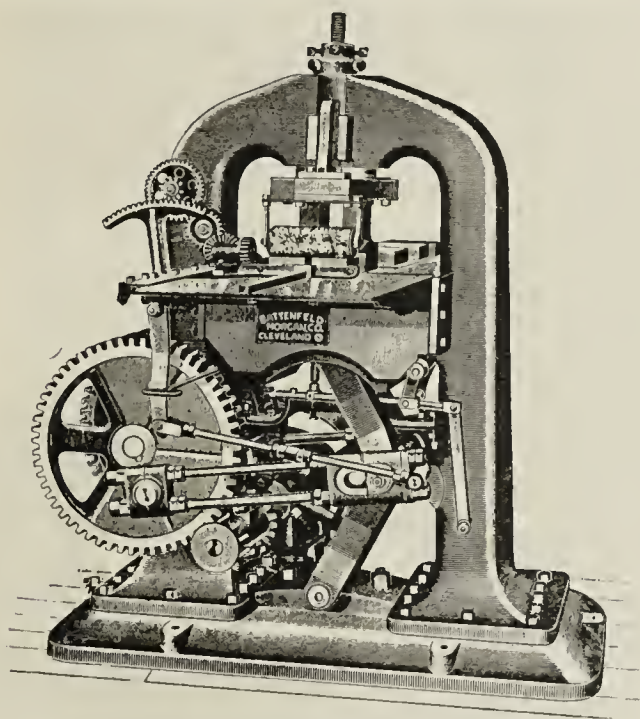
## The Battenfeld-Morgan Co.

Manufacturers of Clayworking Machinery.

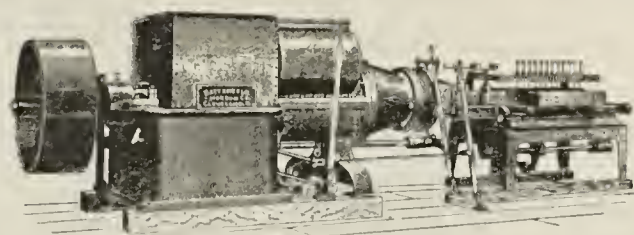
226 to 236 Abbey Street, CLEVELAND, OHIO.



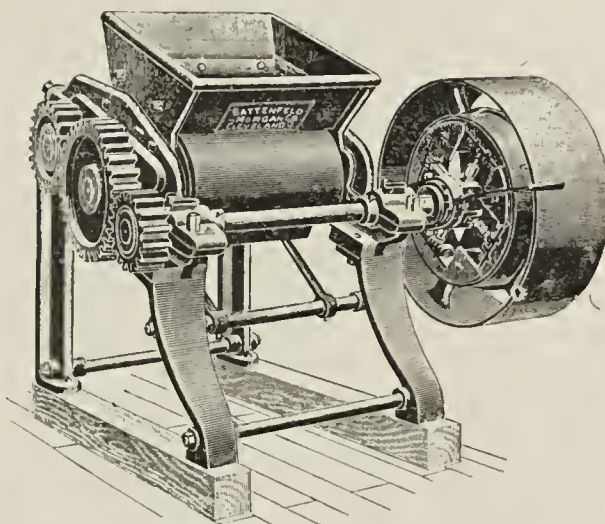
# A Small Representation of Our Family.



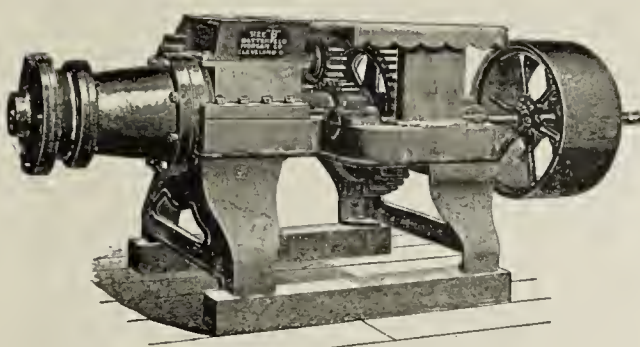
DOUBLE DIE REPRESS.



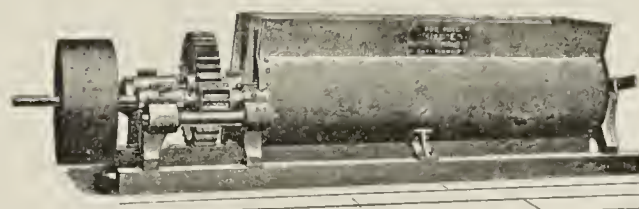
SIZE "AA." MACHINE.  
Capacity 75,000 Brick per Day.



TWO ROLL CRUSHER, SIZE "A."



SIZE "B." MACHINE.



PUG MILL, SIZE "U."

## The BATTENFELD-MORGAN CO.

Manufacturers of Clayworking Machinery.

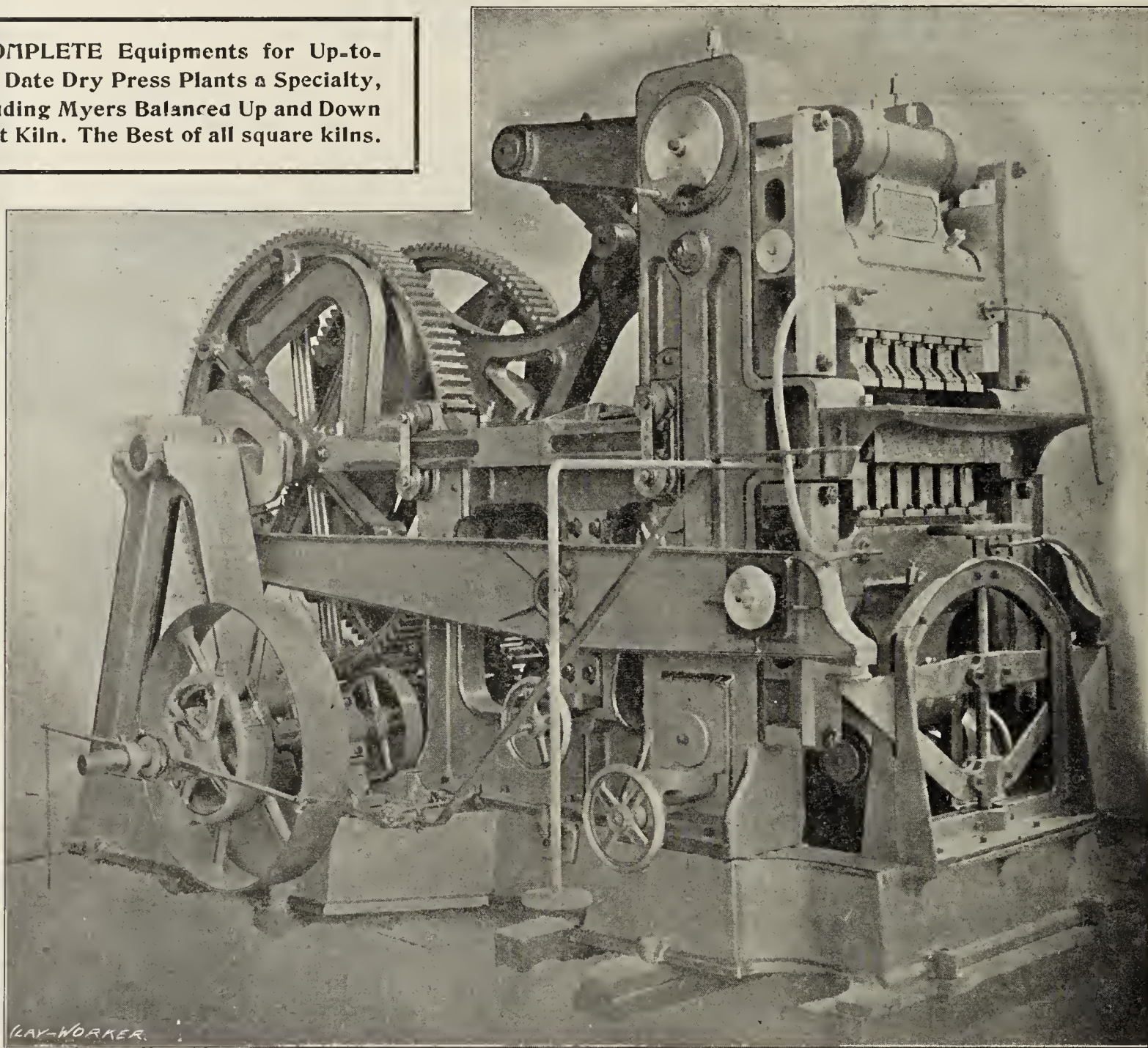
226-236 Abbey Street, CLEVELAND, OHIO.



# The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

**C**OMPLETE Equipments for Up-to-Date Dry Press Plants a Specialty, including Myers Balanced Up and Down Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

## The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

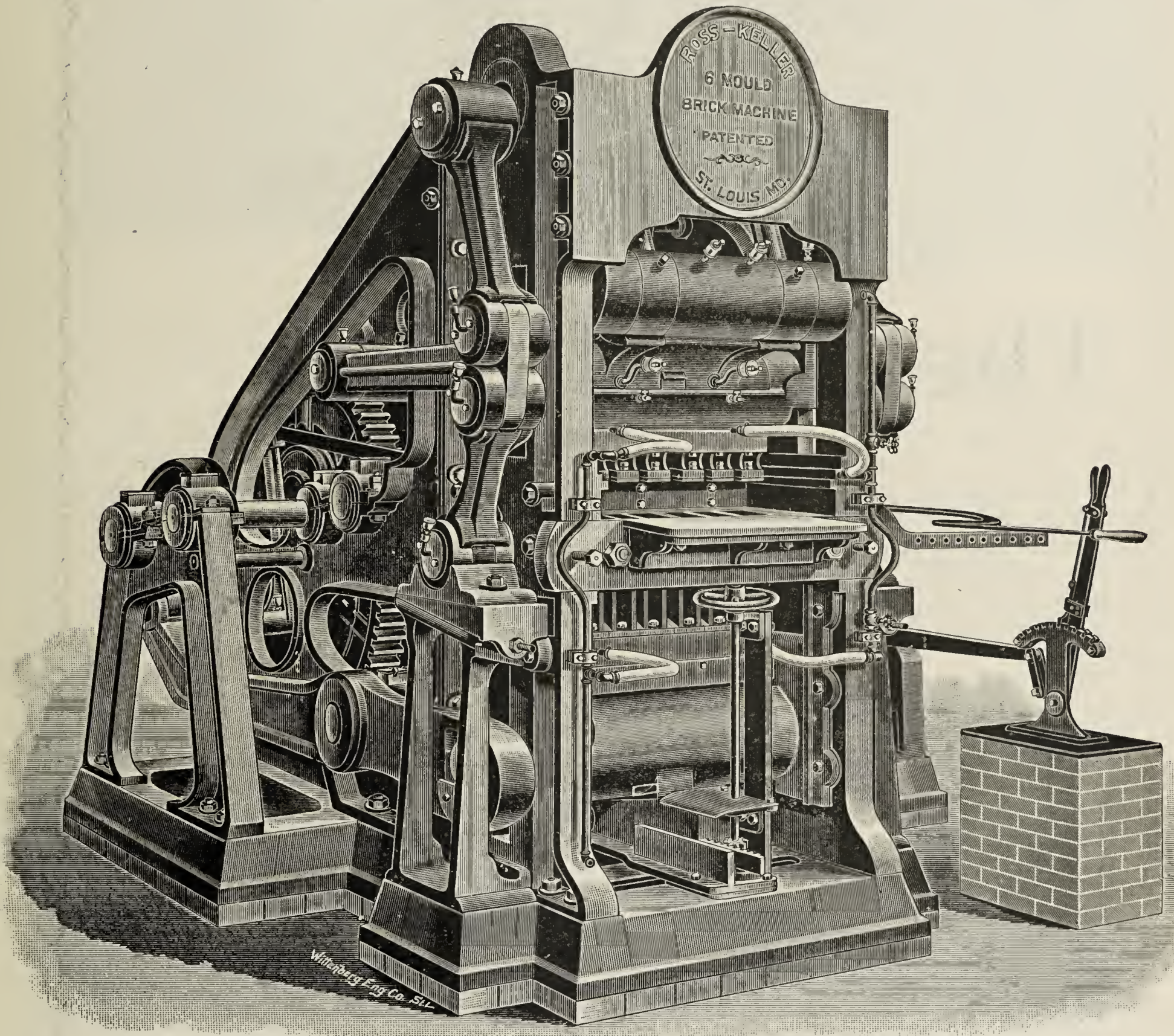
ST. LOUIS, MO.



# The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

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—————BRICK SET IN KILN DIRECT FROM MACHINE.—————



**“The Proof of the Pudding is in the Eating.”**

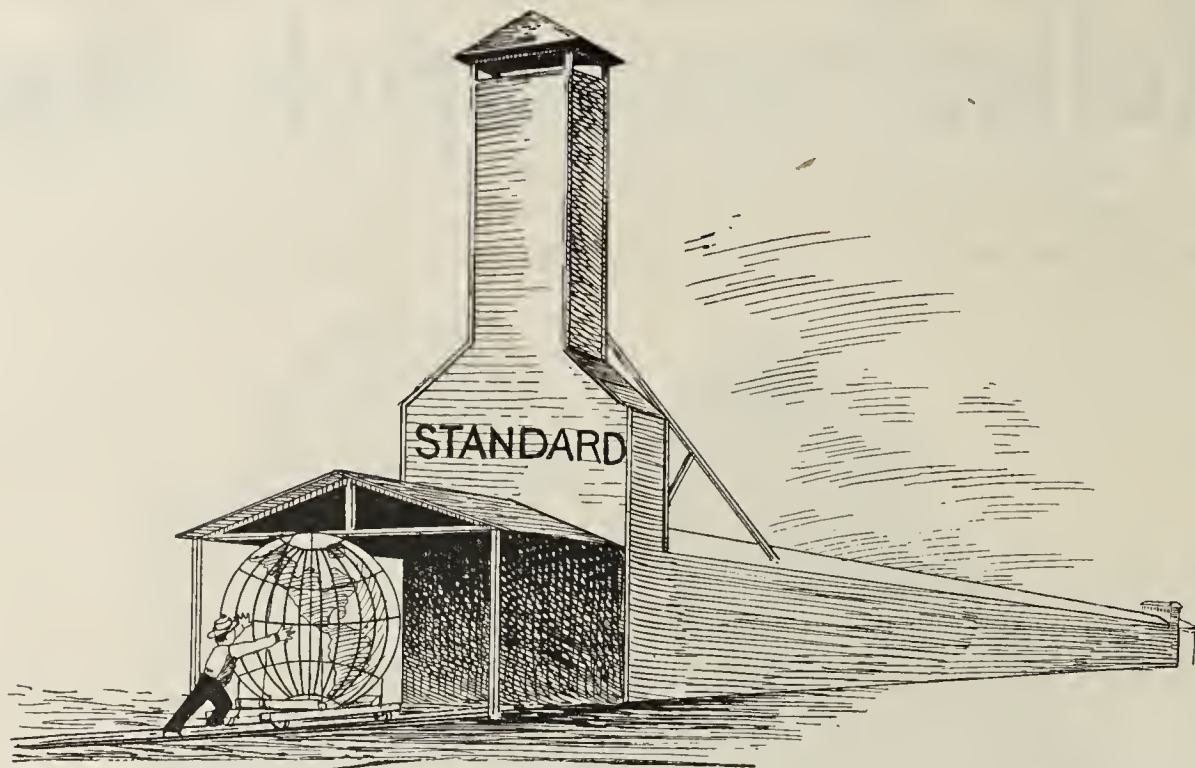
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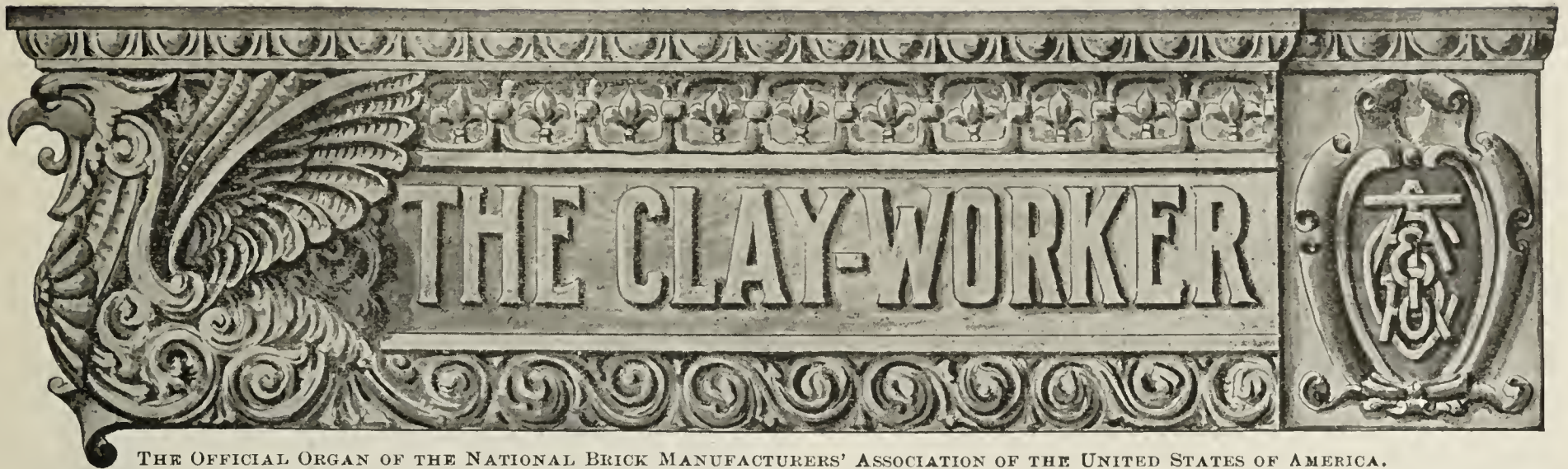
Send for catalog, illustrating and describing our system, also book of testimonials.

# The Standard Dry Kiln Co.,

186 South Meridian Street.

INDIANAPOLIS, IND.





THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXX.

INDIANAPOLIS, IND., DECEMBER, 1898.

No. 6.

Written for the CLAY-WORKER.

### UTILITY AND ART IN CLAY.

BY H. A. WHEELER.

THE ACCOMPANYING photograph of the Bonne Terre Dairy Company's recent addition to useful, yet artistic architecture is well worthy of the careful consideration of clayworkers. For in this very attractive building we have the happy combination of the best and most durable of clay products, exclusively utilized by a skillful architect in producing a most artistic effect in a structure designed for carrying on the prosaic, every day business of a milk depot. With convenience and economy for carrying on a wholesale distribution of milk,

the architect has combined in a head-house, which is used for offices in front of the milk sheds, a strong and artistic conception in both design and color. The color scheme embraces a base of dark buff roman brick that is relieved by white terra cotta trimmings, with a capping of white brick, and the whole covered by a light red Standard tile roof, with dark red terra cotta trimmings. Mr. Herbert C. Chivers is the architect of this successful building, which was built at a very moderate cost in St. Louis last year. It is examples like this that should encourage clayworkers to advance and push their goods as preferable to stone in architecture in securing handsomer, richer colors, greater delicacy in design, and far greater durability, yet at a much lower cost than if an equally as ambitious an effort was attempted in stone.



THE BONNE TERRE DAIRY, Eastern & Garrison Ave., St. Louis, Mo. Herbert C. Chivers, Architects.



Written for the CLAY-WORKER.

### BRICKMAKING IN CUMBERLAND, ENGLAND.



SAID IN the article on Scotland in the September Clay-Worker that I intended to say something at my next writing of clayworking in Cumberland and Northumberland. I am sorry to have been obliged to postpone it so long.

Cumberland is the most northeastern county of England and has an area of 1,500 square miles. It once formed part of the ancient principality of the Cymri in Great Britain. The history of the Cymri is bound up with a part of Scotland—that part which was included in the Ancient Cumbria, but which, since about 950, has been separate from the county of Cumberland.

The scenery of this historic county embraces part of the beautiful lake region of England, made so famous by Wordsworth, Coleridge and Southey. The old Roman walled city of Carlisle, its county seat and the See of the Bishop of Westmoreland and Cumberland, is centrally situated between the beautiful Northumberland hills and the coast and lakes of Westmoreland. Part of the old wall—a small part—of the Roman city still remains and is kept up by the municipality as a "landmark" of the limits of the old city, and also as a mark of interest to citizens and visitors.

The surface of the county is very picturesque, being broken by many small mountains, the highest, Sea Fell and the Skiddaw, both over 3,000 feet. Geologically as well as historically it is an interesting piece of country. The land is fertile as a whole and agricultural industry thrives. The mountainous parts are given up more to cattle and sheep raising, which is done quite successfully.

Apropos: The home-fed beef and mutton one gets at a borderland hotel scarcely has its equal in the States. So different is it from the American prairie-fed, leather-like article that one is tempted to carry a little away for future use!

Mining plays a considerable part in the industries of the county. There are found in greater or less quantities coal, copper, silver, lead, iron, plumbago, limestone, marble and silurian slate. All these conduce to make manufacture important. Coal being mined so close at hand has given an impetus to clayworking, for clay is readily gotten for all purposes. I may say in passing that an English clayworker would hardly know how to burn a kiln of bricks with wood, for he never saw it done. Wood is a scarce article, so he, perforce, uses coal.

It is into this historic county that I want to take the reader for a little while. Out of the many brickyards and clayworking establishments in Cumberland and Northumberland, and there are many around New Castle-upon-Tyne in the latter county, I have chosen one of comparatively few years history. There are reasons for doing this. One must remember that the English people move very slowly, but very sure. I did not want to vex the reader of the Clay-Worker with an account of a lot of antiquated methods, so when I discovered that my stay would perforce be short in the north. I sought the most modern yard in which the most modern work is done. I am well aware, of course, that in other parts of the country even superior work in fancy material is done, but we are now limited. Consequently, then, I visited the establishment of John Beaty & Co., known as the "Crown Brick & Tile Works." I was fortunate in meeting the president at the yard. He was exceedingly hospitable to me. He displayed close observation wide reading and much practical knowledge of the business, though for many years he has been engaged as a builder and contractor. I may say for the interest of those who subscribe to the Clay-Worker that before I left he paid me a year's subscription to what he called an admirable magazine. He

thoroughly perused the paper and had no hesitation in handing over the "cash."

The Crown Brick Works is not more than five years old, so it is still in its infancy and formation period. There are, however, the foundations of a large plant. The company own a good many acres of land, all of which is full of clay.

The clay found there is red and of a plastic nature, though towards the surface there are streaks of blue. It burns a good red color. It is free from stones and gravel and is very easily dug and worked. There are twenty feet of good workable clay in all the ground which the company owns. Practically the supply is inexhaustible, hence I predict that the American may see a fine establishment there in a few years.

The system of manipulating affairs in the yard is not perfect but it is good. It is by no means complete. The clay is loaded on trucks and pulled by a horse along a narrow-gauge railroad into the mill. It will eventually be hauled up by steam. The trucks are built on the same principle as the American automatic dumping car and work as easily; indeed, if I remember rightly, they are built after an American pattern. The clay after dumping goes through two sets of self-

feeding rollers before it enters the pug mill.

A double auger machine is used, which, the president said is not good for plastic clay. He is in consequence, going to remove it. He believes in nothing that causes trouble and hinders a gang of men, though he is not at all exacting with his men as I trust I shall show later on.

The bricks are all wire cut, and on their leaving the machine are not touched again till set in the kiln. A narrow-gauge railway runs right up to the machine and the bricks are placed on the cars on pallets which fit into a home-made frame. The reason for using a frame on the cars is that time is saved



"Standing alone, like a Grim Sentinel."

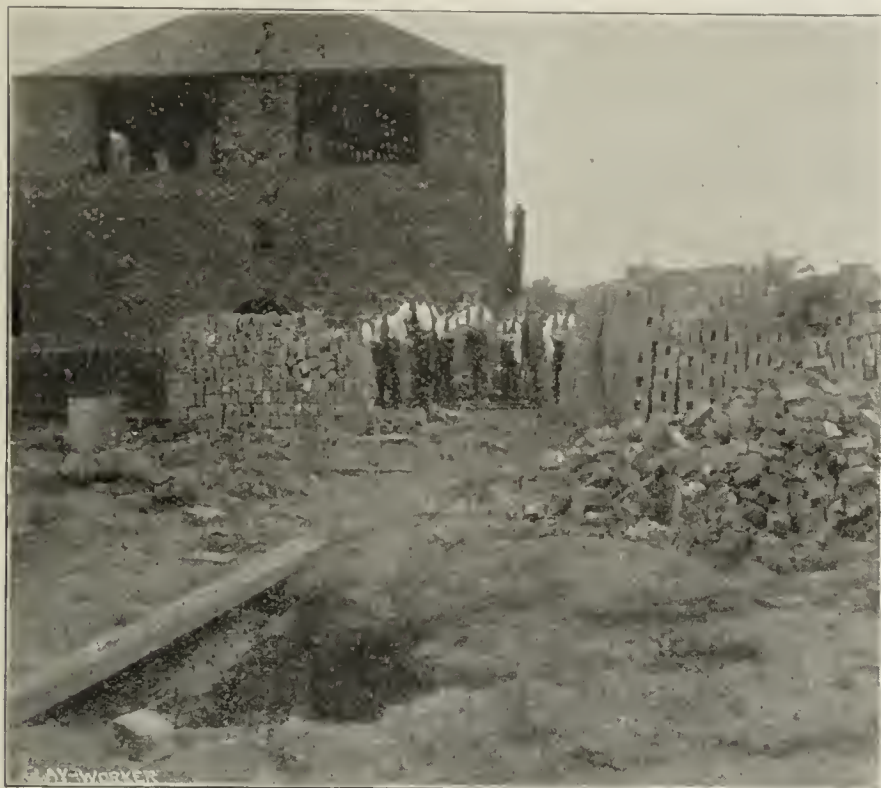
in the drying and better results secured. There is no danger of a load of bricks falling in the middle of a tunnel, or of finding the middle of the load green and unfit to set when the outside ones are perfectly dry. I have seen hours, which soon run into days, wasted in some American yards in picking up loads fallen in the tunnel and taking back green bricks from the kiln. It pays to give the hot air all the chance possible to circulate through the middle of the load.

As well as having hot air driven through the tunnels steam pipes are laid from one end to the other which, the company considers, make a perfect system of drying. At present the yard has but seven tunnels, a hundred feet long, with a capacity to hold 30,000 bricks. There are, however, some good large out-door drying kilns with concrete floors, underlaid with hot air channels, into which most of the waste heat goes. These outside drying places are considered very paying conveniences. The company has one other method of drying which appears very unique, for I have never seen anything



like it in the States. The picture below will explain what I mean. The building, as you see, is quadrilateral in shape. The lower part consists of two kilns opening at either end. Over the tops of the kilns is a drying house and is pronounced to be a good one. While the kilns are being filled the green bricks are put into the drying house, and by the time the kilns are burned every brick on the top is ready to set. This is of course a rare way to utilize the great amount of heat so often wasted. The number of bricks dried in this way will be nearly enough to refill the kilns.

Standing in front of the groups of men in the picture is the



Dryer and Kiln Combined.

foreman into whose hands the manipulation of the plant is placed. He is a practical man, having had forty years' experience in English brickyards. To his experience the yard owes its good facilities. He demands a good salary, but the president says a good experience is worth a good salary; and poor workmen are dear at very low wages.

So far the company has made little but bricks, building and paving, and draining tiles. It is their purpose to go into terra cotta work on a larger scale. A little has been already done very successfully. Some fancy work and a little pottery have been tried with reasonable success. Most of what has been done are fancy ridge tiles, fancy flower pots, vases, etc., and decorations. The specimens I saw were very good and showed the suitability of the clay for that work. Their paving and facing bricks are all repressed. The demand for perforated bricks is good, so they have planned to make a good many of them. The repress machine used, manufactured by Pullan & Mann, of Leeds, is unique, so I give a short description of it.

It is a power screen press in which the qualities of the hand machine, viz.: ability to repress high-class front brick, flooring and roofing tile, have been retained, but the capacity is increased nearly 100 per cent. The labor of one or two men at the wheel is entirely done away with and a uniform pressure is retained at each stroke. Power is transmitted to the press by a straight and a crossed belt driving the belt pulleys in opposite direction. By moving the cone clutched into gear alternately with the belt pulleys the screw is driven in the direction of bringing the pressing plunger up or down as desired. The starting handle is balanced by two springs and when released brings the cone clutch out of gear with both pulleys and stops the press. The machine automatically stops itself at the top of each stroke.

The action of the power arrangement on the press is exactly

the same as when worked by hand, the blow being struck by the momentum of the fly-wheel, and the mechanical parts being used simply for starting it and bringing the plunger back again.

Any Titley hand-press can easily be converted into a power machine. The press, being worked by one man, exerts a pressure of thirty tons. The capacity of the power press is 5,000 bricks per day, ornamental bricks in proportion.

In the design a large factor of safety has been allowed and the workmanship is of high grade throughout. A solid steel double-action screw is used together with phosphor bronze nuts and self-acting lifting motion. With the screw being double-action, i. e., with a right and left-hand thread, a traverse equal to twice that of an ordinary screw is produced and a distance of five and one-half inches is described by the plunger with one revolution of the wheel. The plunger has a large wearing service and is accurately planed and fitted. The die is solidly bolted down to the bed plate and hence remains perfectly rigid.

Unfortunately, through the location of the machine, I was unable to photograph it.

At present there are four kilns at work, all down-draft. These down-draft kilns are to be replaced in time by a better kind. They consume too much fuel. This is an important consideration in England, since coal is expensive and, moreover, the English are beginning to realize that their coal supply is not inexhaustible. The importation of fuel into the island is only a matter of time, unless something is discovered or adapted to substitute coal. The kiln that seems likely to become most common is the riddle-bottom kiln. Its advantages are that it takes the steam away in the process of burning, burns a better colored brick, and consumes less fuel. It will burn slack very satisfactory and is said to be well adapted for wood, because the fire can be put right under the middle of the



A Riddle-Bottom Kiln in Course of Construction.

kiln. This kind of kiln, I was informed, is only found in the northern part of the country. Its origin was in Scotland. You will remember what I said about the Scotch in my former article—that they are exceedingly slow to propagate their ideas; and the English do not snap at every new fad that may come their way. Everything must win its way on its merit. This is not at all a bad trait of the English.

The foregoing picture is a photograph of a riddle-bottom kiln in construction. I have heard since I left that it is finished and is giving good satisfaction.

The above picture will explain itself as far as it goes. The



kiln is twenty feet long by ten feet wide on the inside; and the walls are over three feet thick, narrowing toward the top. There are two doors at the ends. Over every fireplace on each side is a chimney from four to five inches square; also one between every fireplace in the center of the arch. All these chimneys are left open to carry off the steam until the bricks are red, and then the outside ones are closed. This tends to drive the heat to the center. At a later stage of burning the middle ones are closed also. The time of burning one of these kilns is two days and one night, which I believe is considerably less time than any other kiln of the same capacity. Its capacity is from 18,000 to 20,000, a thousand bricks taking up about four and one-half cubic yards of space. I may say by the way that the bricks average eight pounds and are  $9\frac{1}{4} \times 3\frac{1}{4}$ . The company intends to construct kilns of this sort throughout. They can burn both their fine ware and their bricks in them. I visited a yard in the same neighborhood in which these kilns have been in use for some years, one of which, though not exactly like the one described above, has been used for fourteen years and is reckoned to last eight years more.

The stack pictured on the opposite page is peculiar in that it was erected for the purpose of building a dryer of some sort about it, and the idea of building such a stack for a brick dryer struck me as being rather odd. It is 121 feet high and was erected at an average cost of one pound (\$5.00) per foot. The base, as may be seen, is of fire brick. It is a rare chimney, and is built according to the idea of English solidarity.

The machinery used is of first-class quality. The engine is a horizontal one, with a Lancashire tubular boiler. All the machinery is run with fast and loose pulleys. With the present capacity of their mechanical arrangements, they can make only a little above 20,000 bricks per day, but they have the possibility of a fast growth.

Permit me now a few words from a sociological standpoint. At present part of the work is done by the day and part by the piece. The men go to work at 6 a. m., having had breakfast before they go, and stop for lunch at 9 a. m. They have an hour for dinner and leave work at 5:30 p. m., except on Saturday, when they work only half a day. Their required time is fifty-five hours a week. They are paid for six full days' work. It is a custom practiced by nearly all employers of labor except farmers. Shop-keepers and clerks have their half holiday in the middle of the week. This practice is very exceptional in the States. Now I believe that the reason for the great contentment of the laboring classes in England lies, not in the half holiday itself, but in the spirit in which that and other like things are granted.

In this plant are employed twenty men and boys, working for an average wage of one dollar a day, which I consider to be the equivalent of wages paid in American brickyards. A man will set in a kiln from 10,000 to 12,000 bricks in a day. How that compares with American labor I have forgotten.

It is intended to manipulate the plant just as soon as completed on a co-operative plan. All work will be done by the piece, and losses and gains shared alike by man and master. The government of the plant is already, in a sense, democratic, but will be much more so under the changed conditions. On such principles labor and capital dwell together in peace.

THOMAS JENKINS.

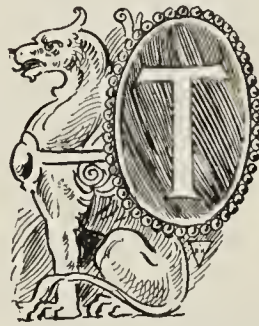
#### GET IT OFF YOUR MIND.

The amount of work done—after it is done—will not hurt you half so much as the thought of that which is to be done. Over-worry is more injurious than over-work. Then don't let the work accumulate—get it out of the way and ease your mind. Brain fog is usually the result of over-worry, and in most cases can be avoided by keeping ahead of the work in hand.—Ad. Sense.

Written for the CLAY-WORKER.

#### PAVING BRICK IN NEW YORK CITY.—No. 3.

##### —Resonant or Noisy Brick Pavements.—



HERE IS ONE SECTION of brick pavement on Macdonough street, Brooklyn, against which serious complaints have been made by the residents upon that street because of a loud and "annoying rumble" resembling the noise of a heavy train passing over a trestle, whenever a heavy wagon is driven rapidly over the surface of a brick roadway. The same complaint has been heard of in St. Louis regarding some of the brick paving in that city, and even the brickmakers' friend, T. A. Randall, has been heard to complain about the roar of the brick pavement of the street upon which he lives in Indianapolis. Indeed, the charge is made against brick pavements in many cities. Now, as this fault, and it is a grievous one, is only found in isolated cases, and does not by any means apply to brick paving in general (for, on the contrary, brick paving is one of the most noiseless pavements), it is clear that we must look away from the brick themselves, if we would ascertain the cause of this "annoying rumble." If the brick do not cause the noise it must be in the construction of the pavement that the noise is



Macdonough Street Pavement, Brooklyn, N. Y.

created. The noise is described as sounding like a fast and heavy train passing over a bridge, or the roll of a mammoth drum beat. May not this apparent effect lead us to the discovery of the cause? All sounds are caused by vibration, and are developed by reverberation; the passing of a train over a bridge and the beat of a drum are both vibrations over a hollow space, which hollow space acts as a sounding board and re-echoes the sound and multiplies its volume.

These facts lead to the opinion that the "annoying rumble" of some brick pavements is caused by the existence of a hollow space under the pavement, caused by some carelessness in the construction of the pavement, or by climatic expansion of the upper surface of the pavement after its construction.

##### —Hollow Crowns Under Brick Pavements.—

May be caused in various ways. First, when brick pavements are built in severe winter weather the subsoil may be uplifted by the frost, and the brick become contracted to their smallest size by the same frost. When the brick are so laid and thoroughly grouted with any hard filling, it is reasonable to suppose that, with the return of summer weather, the brick arched pavement will expand and hump in the center, and that the frozen subsoil will settle into its normal place.

Second. Should any water leak into the sand used for bed-



ding the brick, after they were covered by the finished filling, especially if the subsoil were sandy, it would have a tendency to make a permanent hollow space under a hard-jointed brick pavement.

Third. In the case of two-course brick pavements there is an increased liability to have such a hollow space, unless vigilant care is exercised to avoid it. Unless the lower course is well wetted and rammed or rolled to a solid foundation before the upper surface course is laid, such a settlement will surely occur. When the surface course is laid and securely filled with any hard filler or grout, it forms a flat arch resting against the two sidewalk curbs which, if the abutments are competent, is able to carry any load that is likely to be taken over it. If, therefore, the lower course or foundation can settle, or if the sand used for bedding can by any means escape from the lower surface of the arch, as, for instance, into the joints of the lower course, we shall have constructed a huge masonic drum, which will most surely perform its natural function, and with its "annoying rumble" betray our bad work.

#### —How May This "Annoying Rumble" Be Avoided?—

It must always be remembered that the noise is far more apparent within the houses on such a street than it is out of doors, and it is the persons sitting in the quiet of their homes who are annoyed, rather than the persons who are passing along the street. Therefore, it is desirable to use some non-conductor between the pavement and the sidewalk. Such a nonconductor is shown in the sketch, Fig 5. It consists of a one-inch board placed against the curb and resting upon the concrete foundation, of such a width that its top edge is flush with the surface of the finished brick pavement. This board will prevent any vibrations of the pavement being transmitted to the sidewalk, and thereby prevent them from reaching the houses. It will also act as an elastic cushion for the abutment of the brick pavement arch, and in a great measure counteract the humping of the pavement in hot weather when the expansion is liable to occur. There need be no doubt about the durability of such boards if they are treated with creosote or even painted with hot tar. Being entirely below the surface they have no wear and are not liable to decay; therefore, they will last an indefinite time, and even when they perish the pavement will surely have settled on a solid base and the joints will be filled with elastic dirt. For pavements which must be built in the winter such boards would prove a safeguard against humping.

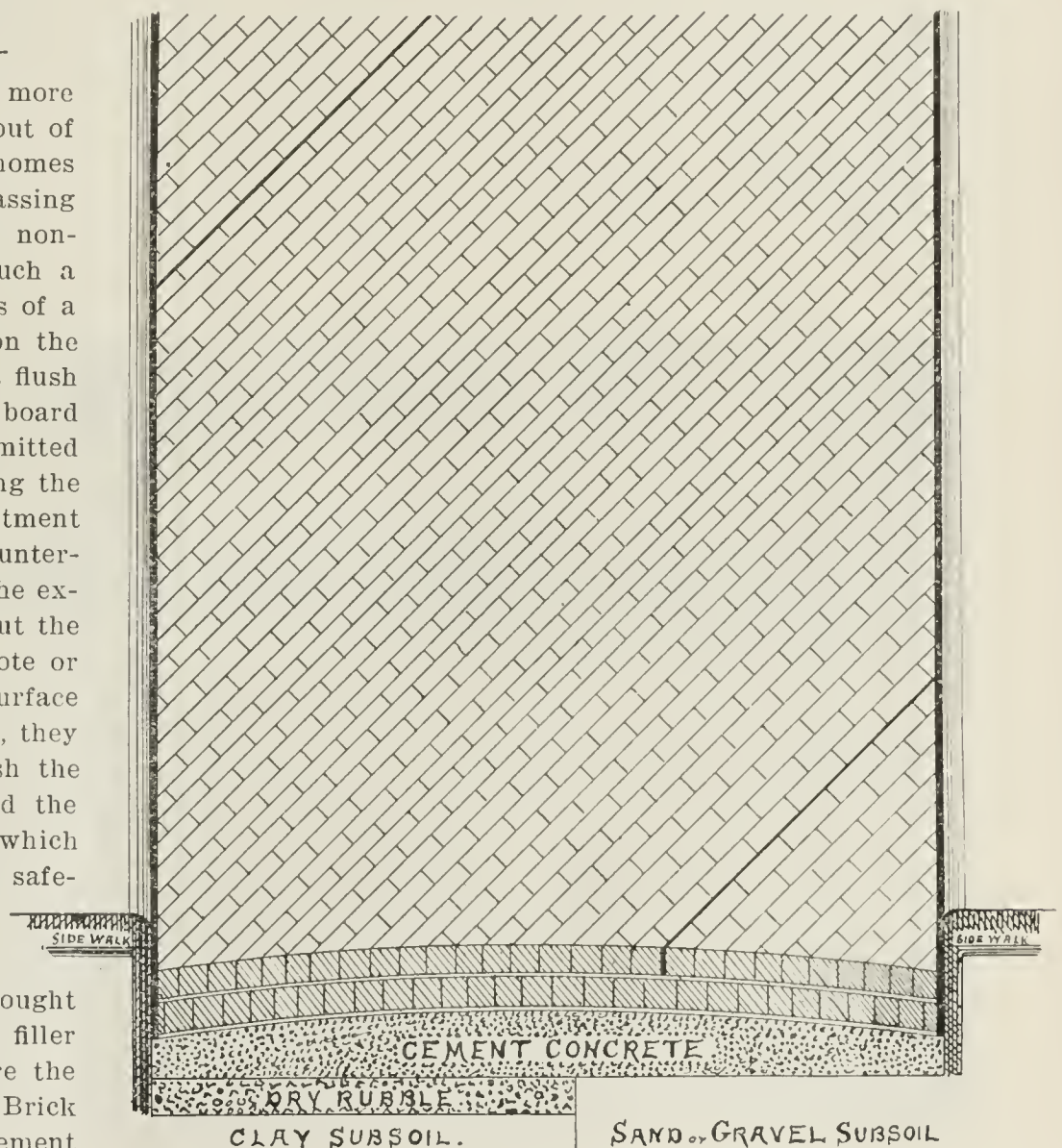
#### —Climatic Expansion of Brick Pavements.—

Some engineers of highways have given considerable thought to this subject when taking into account the question of filler for the joints of brick pavements. Right here is where the brickmakers want to watch the asphalt paving makers. Brick pavements require no help from asphalt. Brick and cement and sand can go it alone. Some road builders have recommended that at every fifty feet of pavement one joint should be filled with asphalt to counteract the longitudinal expansion of the pavement. A far better method would be to use a half-inch board (creosoted or tarred), four inches wide, as shown in Fig 5. This thin board will form an elastic cushion and at the same time act as a nonconductor of sound, thereby breaking the sound waves at every fifty feet, and reduce the noise of traffic, especially if the simple diagonal method of laying the brick is adopted.

#### —Filling of Joints in Brick Pavements.—

The subject of what is best to use as a filler of joints in brick pavements is an important one in the durability of such work. It is absolutely necessary that the brick should be firmly held in place, so that there is no motion, because the slightest movement involves a sure loosening of the work, and consequent chipping and breakage. Various materials have been suggested and used and have their advocates. Sand alone is

often used, and in some cases may be satisfactory, but it is liable to be both washed out by water and blown out by wind, and therefore cannot be considered as a good filler for brick pavement upon public roads. Some special and secret compounds are also in vogue and have given good results, but if expensive their cost is greater than their value justifies. Melted tar and pitch have some recommendations, but its liability to become soft in hot weather must always make its use objectionable. The asphalt filler is offered by the asphalt pavers as the very best material to be used (of course if the asphalt is not used for the surface it is better to sell it for joint filling), yet the brick paver should not use asphalt in any way in his pavement, or he may find the asphalt paver persuading the engineer to have the brick entirely covered with a thin coating of asphalt. This was actually done on the Jamaica turnpike in Brooklyn two years ago. There is no secret in making the very best filler. Any good hydraulic cement mixed



The heavy black lines indicate the wooden cushion and the method of use suggested.

in correct proportions will answer every purpose. Rosendale or dark cement should be two parts sand and one part cement by measure. Portland cement should be three parts sand and one part cement by measure also. The cement and the sand ought to be thoroughly mixed in a dry state until every particle of sand is colored with the cement and no dry cement can be seen; it should then be saturated with water until the whole mass becomes semi-fluid, in which condition it should be swept into the joints until they are solidly filled. The mixing of this cement grout should be done upon the finished brick pavement and swept forward toward the brick which require filling; by this means a rich coat of cement is given to the already filled joints, and if there has been any shrinkage or vacancies left they become filled.

#### —Foundation for Brick Pavements.—

No peculiar foundation is required for brick pavements; any



foundation that is approved and suitable for any other pavement is good enough for a brick pavement. Paving brick ask for no favor of "special privileges." Brickmakers only demand "equal opportunity." A substantial bed of concrete from five seven inches thick, upon a compact subsoil, is the best under all conditions, and is a foundation upon which any good brick pavement if properly laid will prove equal to all demands that can be made upon it.

—The Subsoil Under the Foundation.—

Where the subsoil is of sand or gravel the concrete may be laid directly upon it, but where it is of a compact and wet clay it would be best to put between the subsoil and the concrete a layer of four inches of dry rubble or broken stone, especially in places where there is liability to disturbance by severe frosts.

JAMES TAYLOR.

Written for the CLAY-WORKER.

### STREET PAVING IN DAYTON, OHIO.

BY ELLIS P. RAYMOND.



DAYTON, OHIO, SITUATED in the heart of the fertile Miami Valley (one of the garden spots of the world, by the way), with its large manufacturing interests and palatial residences, its broad, straight streets and handsome lawns, its luxurious shrubbery and stately old shade trees, certainly holds undisputed the title of the "Gem City" of the West. Near here, it will be remembered, is situated the central branch

war we now call street cars that go about with the wings of the wind, the energy of lightning and the voice of thunder, ruthlessly slaying in cold blood all who cross their path at an inopportune moment, regardless of sex, age or color. These would then have been banished by polite society as works of the devil. The cars I speak of were inoffensive, unpretentious affairs, each drawn by two innocent little mules, who jogged contentedly along on their quiescent mission to the merry tinkle of the street car bell, offering a long season of peaceful repose to the weary traveler who sought their benign assistance on the journey of life. In short, ancient Dayton was a bucolic vision, or, rather, nightmare, of urban peacefulness, rural simplicity and mud.

But this was not destined by Providence, or whoever manages that department of the affairs of men, to last, and the Dayton of to-day, with its miles of paved streets and sidewalks, its handsome modern business blocks, its electric cars and interurban traction lines, would surprise and astonish its most sanguine forefather. It has been almost entirely rebuilt, and few of the old landmarks remain. There is one, alas—the so-called "Union Passenger Station." As this is a subject, however, which no loyal Daytonian can discuss with composure, I will not enlarge upon it, save to say to the traveling public: "Please do not judge Dayton by its depot."

The genius of street paving first appeared here about ten years ago, and, strange as it may seem, began operations on the sidewalks. This resulted in the wholesale destruction of



[Second Street, Dayton, Ohio, looking East. Paved with Canton Repressed Blocks in 1892.

of the National Soldiers' Home, which is kept by the government as fair as the Garden of Eden, and it has probably been the silent but potent influence of this institution more than any other that has moved public opinion and opened the way for the many improvements that have been accomplished, both municipal and private, for the beautification of the city.

Those who remember ancient Dayton of twenty or twenty-five years ago, would scarcely recognize it now. True, its streets are wide and well shaded. They were paved, too, alternately with limestone dust and a tenacious and extra adhesive quality of mud, as dictated by the caprice of the weather, with recurring ever and anon deep ruts and deeper mud holes to keep the unsuspecting driver interested and on the alert. The sidewalks were also paved. Brick, cement, stone, boards, cobble stones, asphalt, gravel, mud, sand, hills, valleys, ruts, holes and what not, all played a part in making these remarkable structures. Street cars? Yes; not the dangerous chariots of

the entire mongrel breed of walks with which the city was blessed and the replacing of them by carefully surveyed cement ones, all of uniform width, with grass plots on either side, except in the business portion, where they were continued to the curb. A few of the best of the old stone ones were readjusted to the proper proportions and left, but all others were barred. This had a wonderful effect on the appearance of the city, and immediately opened the question of the streets. Here was the rub. What to do with the great broad expanse of turbid mud we called streets was the question of the hour. The papers discussed it—the council and various city boards discussed it, the citizens discussed it. The answer was silence. It was the enigma of the hour. Matters remained thus for some time, until finally one of the city fathers (which one, a considerate and discreetly silent Providence only knows) who read the papers and evidently believed them, discovered a wonderful new machine for making streets. It was said that you could take



gravel, castings, mud, old shoes, tin cans, brick bats—in fact, in modern slang, “any old thing,” place it on the streets, and, by using this remarkable machine, lo and behold, it would immediately resign its original incorrigible and irrefragable nature, lay down with the meekness and docibility of the proverbial lamb, and form a street as level as a floor and beautiful as a dream, unparalleled nowhere, unless by the gold brick streets of the New Jerusalem. Again the matter was brought before the community, discussed, rediscussed, post discussed, subdiscussed, and resulted in the appropriation of a fund with which to purchase one of them. We had now solved the great problem of paving streets. While others sought to win the prize by the slow and expensive process of surveying, excavating, building concrete foundations, making and laying bricks, granite, asphalt, etc., we would languidly repose on flowery beds of ease and watch our beloved machine turn out paving by the square yard. Do not smile at us, dear reader. We were only blindly following that ever illusive *ignis fatuus* which all have pursued at various times known as “something for nothing.” We expected to steal a march on civilization and were happy and contented in the sweet inner unconsciousness of our own stupidity.

Expectation was on tiptoe until the eventful day when the wonderful machine arrived, and it proved to be a mammoth three-wheeled steam roller. It was immediately put in operation and started puffing triumphantly through town, belching forth volumes of black smoke and scaring horses and dogs

pipes. The public soon lost their respect for it and it became the joke of the town. The newspapers paragraphed it. It was named the “Huffman Tricycle,” in honor of the gentleman upon whom the remainder of the city fathers succeeded in shifting the responsibility for its existence. These experiments were kept up for some months, however, until finally it was discarded as an ignominious failure, and but one thing was demonstrated (which has been demonstrated many times and will have to be demonstrated many times again before the guileless innocent public find it out), and that is, there is no method under the sun of packing gravel but the ancient and honored one of which mother nature is the inventor and patentee and fatter time the sole proprietor and operator. After a year or so, when these streets had become packed in the customary way, they made fairly good roads of the kind, and with the addition of a little new gravel occasionally remained in a fair state of preservation. Thus ended our first attempt at street paving.

After this experiment, the public mind awoke to the realization that the right one was the only way to pave streets, and began to seriously contemplate steps in that line, which resulted in the year 1891 in laying 2.49 miles, or 40,078 square yards of pavement on some of the principal streets. These were laid with six-inch concrete foundation and guaranteed for five years. Of these pavements 18,716 square yards were Hallwood blocks, 15,580 square yards were John Porter re-pressed blocks, the remainder were Medina stone, granite and asphalt blocks.



Main Street, Dayton, Ohio. Paved with Jno. Porter Re-pressed Blocks in 1892.

frantic, while the admiring citizens watched proceedings in silent, respectful, “see the conquering hero comes” awe. It was then taken to the street that was to be the base of operations. This street was closed to the public and all the available force of carts in town put to hauling gravel and dumping it thereon. The gravel was then leveled sufficiently not to upset the roller. It was steamed up, started to work and the test began. A great wave of gravel and earth rose in front of it and a depression followed it on its course. Back and forth, back and forth, over that gravel it ran continuously for days, when the work was pronounced completed and the street opened to traffic. The first wagon to drive on it sunk in to a depth of six inches or more, others ditto. Nothing daunted by this failure, however, the experiment was repeated on other streets, the rolling being continued a longer time. The results, however, were the same. It crushed the sewers and disjoined the water

They required little or no attention in the matter of repairs. The granite blocks and Medina stones have, however, worn off round, as such pavements do, and form an extremely rough street. The John Porter blocks on Main street have been subject to very hard usage and show very good wearing qualities, and to-day form a good, reasonably smooth pavement. The asphalt blocks have held their own with the rest.

In 1892, 2.81 miles, or 93,467 square yards of additional pavement were laid. Of this 4,426 square yards were Hallwood blocks, 26,897 square yards John Porter blocks, 12,299 square yards were asphalt, with Hayden and Hallwood blocks between the street car tracks, 7,022 square yards were Canton iron rock re-pressed blocks, 14,929 were Hayden blocks and the remainder granite, Medina stones and asphalt. The Hallwood blocks laid this year are in good condition, as also are the John Porter re-pressed blocks. Both of these have held their own in good



shape, with little or no repair. The Hayden block has not been as successful as it should between the street car tracks, and has had to be replaced at a number of places on account of rising from position. The Canton iron rock blocks have made excellent pavement. The granite and Medina stones, however, are in the same condition as that laid the previous year and are extremely rough. The guarantee expired on the asphalt pavements last year, and the company went all over them just previous to this time and did much repairing. Owing to this fact, the streets are in reasonably good condition, and do not show the effect of age near as much as some of a later date.

The year 1893 was the banner year of street paving here, when 10.29 miles, or 276,808 square yards, of various pavings were laid. Of this pavement 88,428 square yards were sheet asphalt, 13,855 square yards Canton and metropolitan blocks, 29,119 square yards East Clayton blocks, 1,243 yards Medina stone, 23,115 square yards sheet asphalt, with Hallwood blocks between the car tracks, 30,518 square yards asphalt, with Hayden blocks between the car tracks, 25,387 square yards asphalt and East Clayton blocks between the car tracks, 2,999 square yards Hallwood blocks and 26,328 square yards Hayden blocks. The various brick laid this year are in good condition except between the street car tracks, where they have had to be replaced in a great many instances on account of their rising from place. The Medina stone has worn off round and is quite rough. The asphalt, while still in a fairly good condition, has settled into ruts and hollows in many places. It is now being put in repair for the last time by the asphalt company, ready to turn over to the city on the expiration of the guarantee.

In 1894, 7.54 miles, or 182,097 square yards, of pavement were laid. Of this 26,215 square yards were sheet asphalt, 16,231 square yards asphalt with Hallwood blocks between the tracks, 11,940 asphalt blocks, 7,406 Hocking blocks, 44,987 asphalt with Hayden blocks between the car tracks, 20,133 square yards pyrogranite blocks, 6,120 square yards sheet asphalt with Hocking blocks between the car tracks, 14,902 square yards Hallwood blocks, 2,541 Hayden blocks, 2,337 square yards asphalt with East Clayton blocks between the car tracks, and 1,654 square yards East Clayton blocks. The same comments which have been made above on the various blocks hold good relative to those laid this year. The pavements are all in fairly good condition, but the sheet asphalt is weakening.

In 1895 but .58 miles, or 13,536 square yards were laid. This consisted of 6,394 square yards of asphalt with Hallwood blocks between the car tracks, 2,191 square yards were asphalt and 2,408 square yards Nelsonville block.

In 1896, 3.31 miles, or 62,251 square yards were laid. This consisted of 16,048 square yards of East Clayton blocks, 20,263 square yards sheet asphalt, 733 square yards Nelsonville blocks and 537 square yards Hocking blocks. There has been but little if anything done in paving since this year, except in alleys and places of minor importance.

The percentages of the several classes of pavement in Dayton are as follows:

|                     |                 |
|---------------------|-----------------|
| Asphalt .....       | 56.06 per cent. |
| Brick .....         | 40.80 per cent. |
| Stone .....         | 5.14 per cent.  |
| Asphalt block ..... | 2.00 per cent.  |

Dayton is peculiarly situated in the matter of paving, as two very opposite considerations present themselves. It is a manufacturing city where a large amount of heavy hauling is done, for which the paving must be heavy, durable and substantial, and at the same time it is a city composed largely of residences and homes, which require streets to be beautiful, smooth and finished in accord therewith. In our aims to achieve both of these ends, a great many pavements have been tried and a great deal of conjecture and experimenting indulged in to determine just what is the best. In fact, we know of no place where there is more variety of street paving used. As will be noticed by the above statistics, after the Medina stone and granite had shown themselves to be too rough for consideration, brick received the next opportunity. A serious mistake was made at this point by some of the brick manufacturers in sending a lot of extremely bad paving brick, which looked more like refused ones than anything else, here and endeavoring to work them off on the city. This caused a great deal of unfavorable comment and threw the ponder-

ance of public opinion the following year almost entirely to asphalt, and there has been a great deal of it laid. This, however, is showing the excessive amount of repair that is necessary to keep it up, and it is also in some places getting extremely rough. The brick pavements as a whole have held their own very well, required very little repair except in the street car tracks, and are to-day by far the best pavements in the city. Public opinion is not slow in realizing this fact, and from present prospects the future paving in Dayton will be very largely done with vitrified brick.

Written for the CLAY-WORKER.

#### PAVING BRICK NOTES AT KANSAS CITY.



KANSAS CITY, MO., has a large number of brick streets and alleys, and, as many of them are laid on steep grades, in some instances up to a 10 per cent. grade, their experience with fillers is interesting.

Sand was first used, but on such heavy grades it washed out, especially as the hydrants are liberally used to wash the streets. This left the edges of the brick exposed, and, as the brick were rather brittle, they gave way, leaving a cobble surface. The Murphy patent grout was then tried, at an expense of 25 cents per square yard (this is a cinder cement), which proved satisfactory in preserving the edges of the brick, but the expense led to its abandonment for a Portland cement filler (one sand to one cement). The Portland cement has proven very satisfactory in protecting the edges of the brick, and it cost only 10 to 12 cents per square yard, though it is found to be objectionable when the street has to be torn up for pipe laying. Asphalt is now under consideration to overcome the objections of the cement.

Paving brick have received a serious set-back in Kansas City from the use of a poor grade of brick in the early days, and in consequence the asphalt contractors now almost own the city, as the result of a very aggressive campaign by sbrewd, energetic experts in municipal pushing.

The mileage of asphalt paved streets is already very large, and other contracts have just been let for eleven more streets, making nearly \$1,000,000 that Kansas City has invested in good streets this year. But the zeal of the asphalt promoters is going to react against them, for they have committed greater blunders than the brick people have made. Asphalt is being laid, not only where the traffic is heavy, but where the grades are very steep, or from 5 to 10 per cent. To lay asphalt on such steep grades is but little short of criminal, and it looks as though the city engineers were as oblivious to the purposes for which streets are used as its criminal courts are to the effrontery and frivolity of train robbing. Kansas City is heavily enough burdened by the blunders of its early engineers in having some of the most atrocious grades and steep hills in the heart of the city, which very gravely interferes with hauling, even on a granite-paved street. But such mistakes are apt to be discovered too late to be corrected without causing an expenditure of time and money that few places think they can afford. But to grossly aggravate the evils of very steep grades by using a pavement that is notoriously the most slippery, even on level streets, of all pavements, shows a want of ability or integrity on the part of the city engineering department which will later on bear decisive results from the tax-bled citizens. Then paving brick, if hedged by the safeguards of a properly-conducted laboratory, will again come to the front, though many of the hills are too steep for safety for any kind of pavement except cobble stones or stone block.

Although Kansas City has no laboratory of its own for testing paving brick, trade stimulation has already greatly improved the quality of the paving brick now on the market, and some excellent brick streets are to be seen in consequence. The paving brick are laid on a six-inch concrete base, with a two-inch sand cushion, and contract prices range from \$1.40 to \$1.60 per square yard.

K. A. N.





### THE WORKS OF THE OHIO MINING AND MANUFACTURING COMPANY, SHAWNEE, OHIO.

DOWN IN THE coal and clay region of southeastern Ohio in the Hocking Valley district, there are located a number of representative clay works, one of which was described in last month's issue. Another pressed brick plant well worth visiting is that of the Ohio Mining and Manufacturing Company, at Shawnee, a typical mining town, about 75 miles from Columbus. The place is not a pretty one by any means, but its surroundings are not without charm, steep hills partly covered with woods. However, since we did not come to see Shawnee, but to satisfy our ceramic curiosity, we turn away from the town and follow a railroad switch, which in a few minutes leads us to a clayworking establishment of no mean proportions. A high board fence surrounds the property, and above the gate a threatening sign of "No Admittance" confronts us. But, not daunted—for, by the way, we happen to know of a fellow clayworker who rules here supreme, and know that he is not of the mean type—we step into the snug brick office, and, as a matter of course, receive a hearty welcome from the busy general manager, W. D. Richardson. The freedom of the yard is readily extended us, and out we start on a tour of exploration.

#### —In the Bowels of Mother Earth.—

Being somewhat systematically inclined, we resist the temptation of visiting the row of kilns, being emptied and set, and proceed to search for the source of the raw material. Since mining is the universal occupation in this part of the country, we find it quite natural that they dig their clay 75 feet under ground. With a feeling akin to uneasiness we board the hoist platform called "cage" by the miners, and suddenly we are whisked down into darkness. Some kind soul has provided us with a miner's lamp, and, arrived at the bottom, we sally out on an underground tour. Cautiously avoiding the wily mules who draw the cars, heavily loaded with clay, to the cage to be hoisted, we come to the face of the workings, where the miners skillfully dig the clay with the help of powder and dynamite. There are two distinct veins of clay, one burning to a cream white, the other to a buff color. They are very carefully separated. In appearance the clay is rock-like and of a grayish color; when exposed to the air it slacks after some time. If there are brickmakers who think that large quantities cannot be handled in mining clay without great cost, they should take a look at this mine, where a small gang of men supplies the clay for an output of about 32,000 brick per day. Of course, the cost of mining, owing to the expense of timbering, etc., is necessarily greater than the cost with an open bank which requires little stripping. Excellent ventilation prevails throughout the mine; in fact, the flow of air is so rapid that the poisonous powder gases are quickly blown upwards. This problem of ventilation, which is such a sore spot with many, especially the smaller Ohio coal mines, has been solved here in the simplest and most efficient way by using a fan

driven by a separate engine. In a few minutes we are again on the surface and breathe more freely. On entering the buildings we meet the genial yet energetic foreman of the works, Mr. S. M. Gould, whom nature, by virtue of his tall stature, has meant for a leader of men.

The loaded cars are run on to a hopper into which the clay is dumped. At the bottom of this hopper a rock crusher is working its ever hungry jaws, and crushes the largest pieces of the hard clay with ease. The reduced clay is still further pulverized and is then conveyed to the clay shed by means of an admirable system of cable conveyors, an original idea with Mr. Richardson. By simply opening and shutting small trap doors the clay is discharged and piled up at any desired point in the shed. The different clays and mixtures for cream white, buff and gray brick are kept separated in large bins provided with paved floors. In this manner a perfect system of handling the clays has been arranged. All the reducing machinery at the end of the clay shed is driven by a separate engine.

#### —How the Brick are Made.—

After having been "cured" for some time the clay is wheeled to another set of grinding machinery, from which it is elevated



W. D. RICHARDSON, Shawnee, Ohio.

to stationary screens. The screened material is fed to two Simpson dry presses. All the regular stock brick and most of the ornamentals are made on these machines. It is and has been the aim of this plant to manufacture nothing but the highest type of front-brick, and for this reason special attention is paid to the care of the molds, which are being kept as true and tight-fitting as possible, and the result is a perfect brick, with sharp corners and edges. The company likewise makes a specialty of ornamental brick of complicated designs, Mr. Richardson having had years of experience along this line. Brick for arches are not ground, owing to their hardness, but are pressed to the required shape and burnt to match the square brick. For deep and edge mold brick two screw presses, hand presses, are used, one of them being a new machine showing a number of original improvements over the ordinary screw press; it is built by the Ceramic Engineering Co.

The power for running the presses, etc., is furnished by a



plain slide valve engine of about 80 horse-power. The three engines in use at the works are supplied with steam by two large boilers.

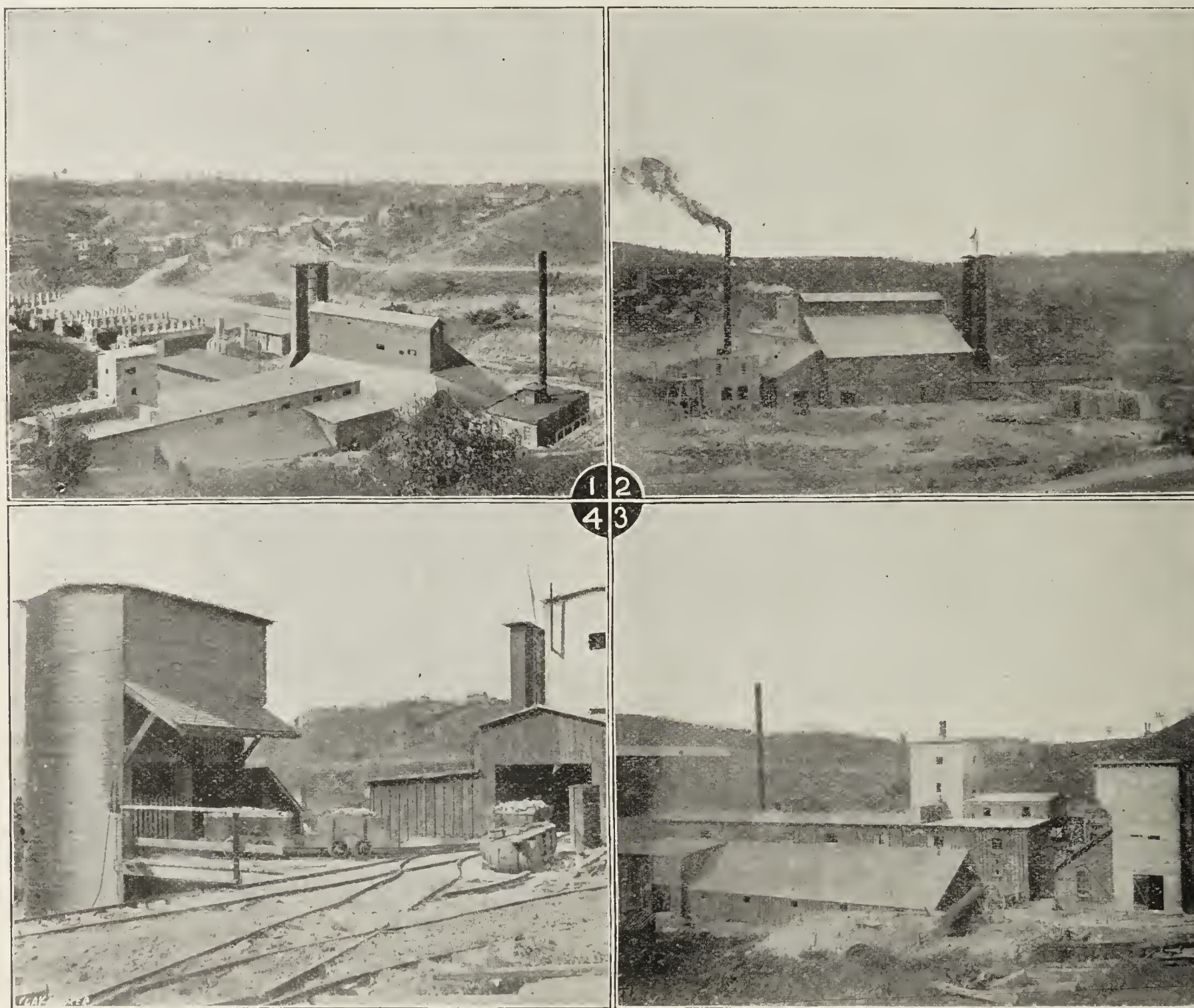
The brick are taken to the kiln on cars. Although a dryer was built before the present management, it is not used now except for storage and in winter, it being preferred to do the drying in the kiln.

The manufacture of flashed brick is made an important feature at these works. Owing to a judicious mixing of the clay, proper setting and burning the output of A-No. 1 flashed brick is surprisingly high and the production is carried on in a systematical and clocklike manner. That the demand for the Shawnee flashed brick is a large one is not surprising consider-

we examined was perfectly level, without the least irregularity. Mr. Goldner takes great pains with every kiln. The temperature during the watersmoking stage is carefully regulated with the help of a thermometer, the settling accurately measured and the heat at the bottom determined by Seger cones. In the burning of flashed brick he is aided by his knowledge of the theoretical processes involved.

The coal for kilns and boilers is furnished from the mines owned by the company, so that the cost of fuel is reduced to the minimum.

The shading of the brick again is in the hands of experts, who have had years of experience in this so very important part of the work. Close shading is the rule throughout, and



THE SHAWNEE BRICK CO'S WORKS, Shawnee, Ohio. 1. Birdseye View of Plant. 2. Boiler House, Machine House and Dryer. 3. Clay Shed. 4. Hoist above Mine Shaft.

ing the beautiful shades turned out, varying from the darker to the light golden shades of brown, and the imperviousness of the surface.

#### —How the Brick are Burned.—

The burning is done in six Yates kilns holding about 100,000 brick each, and a small twin kiln, of which each side is filled with 15,000 brick. The latter kiln is frequently used for special colors, ornamental brick and "hurry" orders. In charge of the burning is Mr. Goldner, in whom we found a man who is nothing if not systematical, and to this is due the excellent quality of the burning done. We cannot remember having seen more uniform burns; in fact, the top of the brick in the kilns which

this is partly responsible for the fact that the Shawnee brick have so rapidly made themselves a place in the markets of Eastern and Western cities in the two years of Mr. Richardson's management. There are two stock sheds running parallel to the railroad track, and having the floors level with the car floor, so that loading from the systematically arranged piles is an easy matter.

The general characteristics of the Shawnee brick are even color, fine texture and perfect shape. The colors are not limited to the cream white, buff, gray and flashed mottled brick, but large deposits of clay are on hand which produce a fine red, chocolate and brown.



## —The Marketing of the Brick.—

As to shipping facilities, the factory is connected with two lines, one a branch of the B. & O. system, the other the C., S. & H., a north and south line crossing the principal trunk lines.

Business even at this season of the year is quite lively with the Ohio Mining and Manufacturing Company, large shipments being made every day and the stock reduced, to be replenished during the winter months. The outlook for next year is very encouraging, and Mr. Richardson expects that the capacity of the yard will be seriously taxed. During the two years of its present management the plant has been run continuously, which, considering the dull times in building, is not a bad record. Mr. Richardson gave it as his opinion that selling pressed brick is as much an art as making them, and to judge from results he is master of both.

Another interesting feature of the plant might be mentioned. Connected with the office is a test room in which experimental work is carried on, for the importance of experimental investigation is fully realized. A small test kiln has been built and another one is in course of erection, the latter to be larger in size. Before venturing upon a new process or change on a



The Shawnee Chief and his Braves.

larger scale it is fully tested by a systematic course of investigation. The value of such a system is self-evident.

Before leaving we took a snap shot at a group composed of Mr. Richardson, at the right of the group, Mr. Gould, Mr. Goldner and the office force. At the yard office only the records are kept and the correspondence is conducted, the main office being in New York.

To judge from the appearance of the general manager he does not put on any style in the yard, and the brothers who have met him only in the hotel lobby would have difficulty in recognizing the Richardson of the N. B. M. A. conventions. We suspect he has a long acquired habit of slipping around dry pans, presses, hot kilns and all such places and rubbing up against them.

On the premises of the company stand two monuments of the past, a blast furnace plant composed of three furnaces and a coke oven. The former is an evidence of a now extinct Ohio industry, the manufacture of iron from native ore. Since the Lake Superior ore has made it impossible for the Ohio ores, which, by the way, are almost exhausted, to compete, this magnificent plant stands idle with all its valuable machinery. The coke ovens stand as a monument to reckless experimenting. At one time a former company was induced to start a coke

plant on the assumption that good coke could be made from the Shawnee coal. The result was a failure, as was to be expected.

Members of the N. B. M. A. who will take the trouble of visiting Shawnee will not make a mistake, inasmuch as they will see a well-appointed yard in every sense of the word, and no doubt a hearty welcome will be extended them. AMERICUS.

Written for the CLAY-WORKER.

## BUTTON HOLE TALKS.

The

COLD SLEET of a northeaster was beating against my office window. From every crevice and cranny damp chill draughts came to penetrate to my very bones. My liver, always seeking an excuse to quit work, had gone clear out of business, and, speaking of business, it seemed that all the vexations of the year had waited for the chance to jump on me when my liver had rebelled. Everything was a cold blue anyway, but when looked at through my eyes that day, no blue was intense enough to use as a comparison for the general view, as seen by me, and no place was so generally undesirable as the place I was then in, in the worry and sleet.

The door slammed, the draught caught me on the other side, and I turned as my friend Bangs threw himself into a chair, drew a string through my button hole, and, holding the ends tightly, leaned back in his chair and began:

"Remember where we were a year ago to-night? I can see it now myself when I shut my eyes and keep away from these chill draughts you have here. We were away down at Navy Cove, clear down on the south end of Mobile Bay. The day had been delightful and living had been a pleasure, breathing the balmy gulf air, basking in its warmth, and drifting on to the music of rippling water until, as night approached, we floated into the harbor and went to anchor. Our supper had been dispatched and darkness was approaching. Way over to the westward, over Mississippi Sound the light mists had risen as though to meet the descending sun, and, springing up, had caught him in a wrapping of gorgeous crimson and gold. Then the dark mantle of the night had blotted out the more distant shores, then those nearer, and then those nearer still until all were gone. The bay had grown suddenly small, and the harbor smaller. The little boat so full of life, and of life that was so dear to us, had grown infinitesimal suddenly, just the least little bit of a speck on God's great expanse; for this sense of littleness comes very forcibly on the great waters. The schooner lay in her safe anchorage, designated by a flickering ship's lantern as though coquetting and courtesying to the crescent of lights from the pilots' houses that lined the shore. A few of us had paddled out from the shore where we had been and were on our way back in a yawl in the darkness to the schooner, and to the balance of the party.

As we paddled out, there came over the dark waters to meet us the tones of an accordion, breathing hard and soft in alternate gasps, and these were presently reinforced by a voice, and out over the waters, softened and sweetened by the rippling waves, by the night air, by the dim light, and by the knowledge that we were far from home and in strange waters, there floated a lullaby:

"Early in de mornin'  
Sun begins to rise  
Up out'en his corn-cob bed,  
Baby turnin' over,  
Head in merchandise,  
Little kinky, woolly head.

"Hello, baby!  
Shu, shu, shu, shu,  
How's yo' daddy?  
Shu, shu, shu, shu,  
Up and down he goes—  
For it's black pickaninny,  
Just from ole Virginny,  
Goodness how the baby grows."

The accordion wheezed an interim, during which we made



fast to the schooner and clambered on. The ship's lantern cast a flickering and feeble light on the children grouped about the deck, lounging about, but intent on the singer and the song, while he sat surging on the old accordion, and looking out far into the darkness toward the distant shore, where that little cabin held the little chubby babies that were listening to-night in vain for the lullaby.

Our advent in the darkness created no disturbance, for we held our peace, and would by no means break the charm of the scene. His voice again was heard:

"Buy a little carriage,  
't'o take the baby out,  
Let 'im swaller fresh, cool air,  
Feed 'im on gum drops,  
Never get de gout,  
Tie a yaller ribbon in his hair."

Still there was absolute wrapt silence on the part of the little Northerners. The charm of the surroundings was upon them all. The soft beat of the surf, the swash of the water, the dim wavering of the lantern's light, the winking of the eye of the revolving light at Fort Morgan, the steady, though far-off, glare of that at Sand Island, and then the alternately red and white of the Point Clear as it shot back from its middle station, all had their charm. The wheezing of the accordion stopped again, and then, picking in with the voice, came again very tenderly:

"Buy some little shoes,  
To put on his feet,  
Keep out the frost and cold,  
Sittin' by the fire,  
Won't burn 'is nose,  
Ain't but two months old."

Evidently he was not with us. Far over among the pines he was tucking the little ones in their beds, and his heart was just as lonesome without them as grows the heart of any father in sumptuous Northern surroundings, and while the accordion wound along with its alternate gasps, he cuddled them and bid them good-night, and we were dreaming with him until his voice came again out of the darkness:

"Jonah was his namesake,  
Livin' in the whale,  
Sailin' on the ocean in a storm,  
Come all you little chappies,  
And give yo' daddy kisses,  
God bless the day yo's born.

"Hello, baby!  
How's yo' daddy?  
Up and down he goes—  
F'or it's black pickaninny,  
Come from ole Virginny,  
Goodness how the baby grows."

The hold on the button hole string slackened as my visitor concluded. The sleet seemed wetter and the wind colder as I put on my overshoes and overcoat to go home. GATES.

### A FINE PROSPECT.

Publisher Clay-Worker:

I inclose you check to pay for the Clay-Worker to the close of 1899. Please send receipt for same. You had better send the Clay-Worker to my address here for the next four or five months or until my yard is completed. I purchased the Winchester plant here the past season and have made one million and a half brick and am at present putting in machinery for pavers. Have already on the ground 250-horse-power engine and boiler, Charmers machine, and other appliances. I am leaving the building brick plant intact, so that my capacity will be 40,000 pavers and 30,000 builders per day. Trade is fairly good in both lines. Have five and a half million brick booked for next season and a good prospect for business for some time to come.

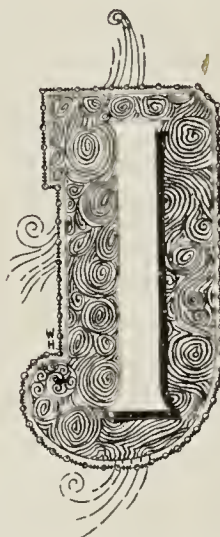
I will attend the Convention if I have time, but it will greatly depend on how I get along with my work.

Wishing you success, I am respectfully,

JOHN GAFFNEY, Winchester Ky.

Written for the CLAY-WORKER.

### WHAT KILN SHALL I BUILD. No. 3.



IN OUR LAST we commenced discussing the question of kiln walls, and noted the absence of any active movement in the direction of improving them.

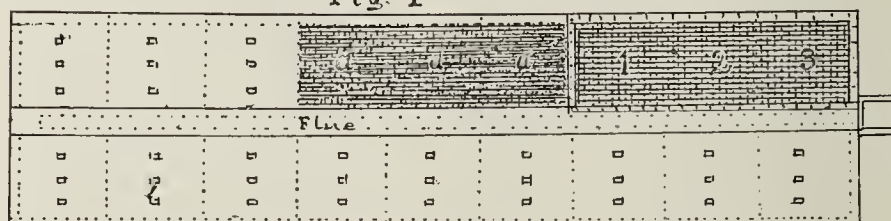
As furnishing a basis for a further consideration of this subject, it seems proper to notice here certain work that is being done in one particular direction as suggestive of one line which, properly worked, gives promise of helping to solve the problem of a greater consideration of the heat generated in kilns for burning either clay or other material.

If we should merely state that kilns were in use made of hollow blocks of burned clay, which were apparently doing good service, we should probably add nothing to the stock of information already possessed by the readers of the Clay-Worker, since the fact has already been noted in these columns.

It seems necessary in pursuance of the object we have in view, to give some detailed information as to the construction of kilns of this character, and what is being accomplished in their use.

Noticing in the report of the last meeting of the Illinois clay-workers a brief allusion by Mr. Maroney, of Chicago, to the Lehman & Kohlsatt kiln now in use in that city, we made it our business to visit it in pursuance of further information; as, in our own thoughts, the use of hollow blocks in some form

Fig. 1



in kiln construction had long been associated with the economical use of fuel. We make now only such statements concerning this particular kiln as seem to us to be necessary in order to enable our readers to form a fair estimate of the value of hollow clay wares for this use. In doing this we will not be understood to be presenting and indorsing the general plan of the kiln mentioned. The kiln as a novelty and as an innovation upon old methods, taken in connection with what is being accomplished in the use of it, is worthy of any space we may give it, but we omit much that might be said in order to present only that which is germane to our subject.

### —What We Found—

May be briefly described as a traveling kiln, constructed to be operated on the continuous principle; the floors, flues and stack only of these kilns were stationary. The ground plan was about 30x120 feet, with a stack at one end as shown in sketch 1. A flue running lengthwise through the center, being above the floor, formed a permanent center partition, on each side of which the kiln compartments were provided for, there being provision for 18 compartments with a floor space of about 12½x12½ feet for each, as shown by dotted lines in the plan, which plan shows the permanent floor for the kiln, laid close, with three openings in the floor of each compartment, connecting with a flue under the floor, which, in turn, connects with the center flue—all else besides that just named being movable. The walls were composed of chimney flue lining blocks, about 9x9x24 inches in dimensions, having walls of the usual thickness, about 7-8 inches, we judge. These blocks were laid in the outer wall, dry sand only being used to bed them. On the inside of a wall so formed, a lining of bricks set on edge and without mortar of any kind, is held in position by



the wares being burned on the outside of the wall at the joints every two feet. Bricks luted with clay are set to cover the vertical joint, which bricks are held in position by a piece of scantling, say a 2x6. Sketches 2 and 3 will make plain this wall construction. Such walls are laid as each compartment is being set with green ware, and when a height of about eight feet is reached a platting of clay blocks about 2x12x12 inches is laid on top of the wares, which blocks are covered with another block of larger dimensions, ribbed as shown in sketch 4. The rib resting on the block platting, air chambers are formed. These blocks being laid, the whole top is then luted with clay to make an absolutely tight cover. The burning is done with oil. The burners located at the top of the kiln are introduced through holes in the platting. It will be seen, then, that the

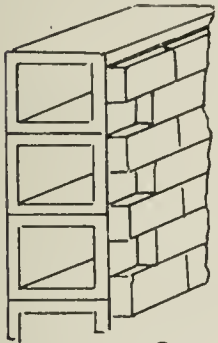


Fig. 2

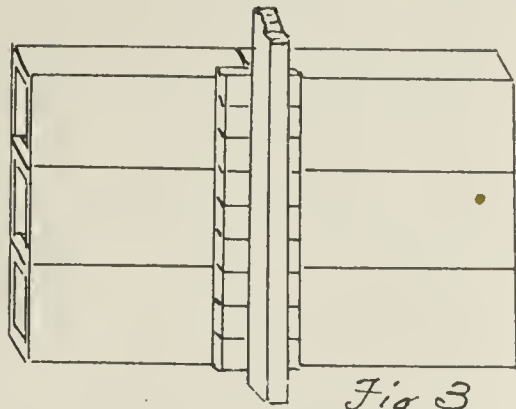


Fig. 3

outer walls of the kiln so constructed have a total thickness of about 12 inches, except at the end joints of the blocks, where a line of bricks covering the joint increases the thickness by  $2\frac{1}{2}$  inches. It will be well to notice that less than  $4\frac{1}{2}$  inches of this wall is solid, the rest being an air chamber. What will most interest is the fact, verified by myself by careful examination of compartments just burned, and from which the walls were but partially removed, that good uniform results are reached in burning face brick and hollow fire-proof blocks. In Fig. 1 the three compartments "a," "a," "a" are occupied by wares that have been burned but not yet removed, though the walls have been removed and now inclose compartments numbered 1, 2 and 3. No. 1 is supposed to be under fire, and the heat escaping from it is watersmoking No. 2, the spent heat from which, when fired, will serve to watersmoke No. 3, and so on in endless rotation, the next compartment to be set being opposite No. 3. The material required for walls for the 18 compartments is only enough to set three or four of them at any one time, as the compartments burned are stripped of their walls as soon as the contents are sufficiently cooled. We are informed the same wall blocks have been used, though not constantly, for over two years. They show little wear and have suffered no injury from heating.

Now, this somewhat lengthy description is given in order to call attention to the fact that  $4\frac{1}{2}$  inches of solid wall, with 7 to 8 inches of air chamber, is substituted for, and is called upon to do the work—and does do it—which kiln walls as ordinarily constructed and averaging not less than 20 inches in thickness of solid wall are built to perform; and further, that these thin, light walls have not a mortar joint, fine sand only being used for packing the joints. You are not asked to indorse the general plan of construction of this kiln, but you are invited to consider thoughtfully the value of hollow material in connection with the construction of kiln walls, arches and crowns.

The only other application of hollow blocks for this use which we have discovered has been found in connection with lining terra cotta kilns, but we cannot state any facts concerning such use at this writing. We may be able to give further information later. In view of what has been stated, we need to inquire why we have deemed it necessary heretofore to build kiln walls thirty inches in thickness? And the first and natural answer to this question is, "Experience has shown it to be necessary." Several reasons may be specifically referred to.

Of course, the prime reason has been for the proper conservation of heat, but next to this has been the demand for a wall that should stand up against the wear and tear which is caused by the alternate expansion and contraction of the material used, subject as it often is to zero temperature on the outside, and at the same time to from 2,000 to 2,500 degrees Fahrenheit on the inside.

Let us stop to inquire what are some of the results to the kiln involved in heating it to a temperature of but 2,000 degrees above atmospheric conditions?

Scientists have furnished us with heat expansion tables, which we make the basis of our calculations. It is stated that 100 degrees of heat will expand a foot of fire brick .0033 of an inch, while the same heat will expand a common clay brick but .00144 of an inch. Hence it follows that a fire brick lining to a kiln will expand about 1-16 of an inch to each foot under a heat of 2,000 degrees. What significance have these calculations to the kiln builders? Simply this: If he is building a kiln 25 feet in diameter he knows that the fire-brick lining entering into the circumference of its walls will expand when under heat about 5 inches, while the common brick backing would, if under the same heat, expand but about two inches; but the common brick are not subject to the same heat, or anything like it, running from perhaps 1,000 to 1,200 degrees on the inside to near atmospheric temperature on the outside. Now, as the usual 8 or 9 inches of fire-brick lining is generally bonded with the common brick, it is, under the stress of expanding, bound to break away from its bonding to the common brick, and, if so, to buckle inwards, or else it is bound to crack open the outer wall, both of which are quite certain to take place.

We band our kilns with 6 to 8 heavy iron bands for two purposes; first, to keep them from soon becoming a heap of rubbish under such disintegrating conditions, and, second, to resist the thrust of the arch or crown. These bands are supposed to have a resisting power of from 50,000 to 60,000 pounds without stretching, and while by their use we are able to hold our kilns together, the unequal expansion tears brick from brick, and the mortar joints are many of them crushed and crumble to powder. And so it is that there must be a constant struggle on the part of the kiln owner to keep up the life of a kiln that is made of almost imperishable material if used under other circumstances. We are reminded of the

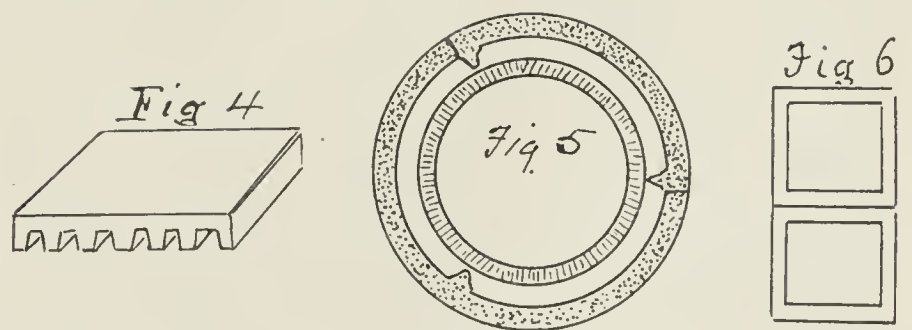


Fig. 4



Fig. 5

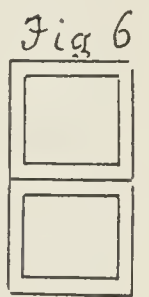


Fig. 6

parable of new wine in old bottles and the new cloth in an old garment, as with pail of mortar or fire clay in hand we patch and mend and patch and mend again. We are made aware, too, that our fight is against the action of natural law, and that we have at our command no counterbalancing force adequate to the demand, and at best we can only continue our patching.

This seems to us a fair summing up of the difficulties attendant upon our present methods of kiln construction and use.

—Are We Likely to Find a Better Way?—

Perhaps a further discussion of the use of hollow blocks in kiln building may give us some light on this question. Let us attempt to find a reason why  $4\frac{1}{2}$  inches of solid wall and 8 inches of air chamber, as found in the kiln we have described, should be found adequate for doing the work which 20-inch solid walls are ordinarily provided to do.

Nearly every one knows that an air chamber is a good non-



conductor of cold or heat, yet very few are prepared to offset an 8-inch air chamber against 16 inches of solid wall. That few practical men even, whose business should make them experts in this line, have come to an understanding of its value may be inferred from the fact that builders of refrigerators, refrigerating plants, etc., etc., still use to a considerable extent a filling material, where better results should be had with an empty air chamber, and we find fibrous fillers, or asbestos, mineral wool and magnesia compounded with fiber, etc., etc., constantly used as substitutes for air chambers, and the probabilities are that eight out of ten of our readers will be ready to assert that a chamber filled or packed with any of these materials will do better service than the empty chamber.

Now the value of all such material depends upon how much air space and how little solid material is found in each cubic inch of such non-conducting substance. It's the air space and not the material that is of value. Indeed, the material subtracts just the solid volume it contains from the value, provided, however, that the chamber be a sealed one. The only proper use of those various materials is that they may be employed where they furnish the cheapest or handiest method of securing air cells or chambers. Watch a workman as he covers a steam pipe, for an illustration. Most likely you will find him using asbestos or other fibrous material either compounded in a felt and tied on with a wire, or perhaps made into a fibrous mortar and applied with trowel, in either case to be later covered with a canvas to insure its keeping its position, which canvas is subsequently rendered air tight by the application of whitewash or asphalt. The clayworker can make a better covering for his steam pipes by making what may be called a tile with internal V-shaped ribs and scoring same to break apart when applied to pipe, the thin edge of the ribs only coming in contact with the pipe—the ribs broken away sufficiently to accommodate a pipe coupling where one occurs. Wire these in position and cover the end and side joints with strips of cheap cotton, using asphalt as a paste and afterwards covering the whole with a coat of asphalt to render air-tight (see cross-section sketch). This is a digression, but it may serve a double purpose, as illustrating the principle underlying heat conservation which we have advocated, and at the same time suggesting to clayworkers an added use for clay products.

The value of air as a non-conductor of heat arises from the fact that it is a non-absorbent of it. This will be clearly shown to be the case from the fact that as we leave the earth's surface, even in tropical climates, the atmosphere soon reaches the zero point. A statement has just been made by balloonists, who ascended to a height of about five miles and found the temperature to be forty degrees below zero, and this may be true when the fiercest summer heat is prevailing at the earth's surface, and simply because the solid earth absorbs the heat of the sun's rays from which the forty miles of air blanket which covers the earth has taken no toll in their passage through it.

In Sketch 6 we show an end view of blocks employed in the kiln we have described. The air chamber being eight inches square and the walls seven-eighths inch thick, it follows that in each block we have less than one-fifth of the heat conducting surface that we would have in a solid brick wall section of the same superficial area; in other words, we have interposed

in our wall a body of air that refuses to act as a carrier of heat and which comprises more than four-fifths of the wall surface, and it will be apparent that to a corresponding degree we have excluded the zero temperature which may be prevailing outside the kiln. We trust we shall be excused for taking so much space to demonstrate this simple proposition of the value of an air chamber.

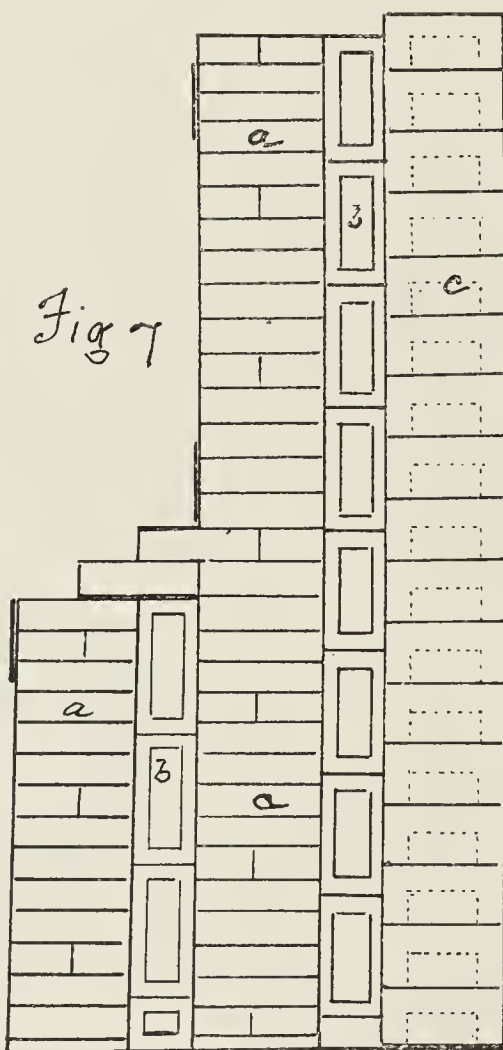
The practical question is, how shall the principle that has been demonstrated be best applied in the construction of a permanent down-draft kiln, whether arch or crown? It may not be well at this time to suggest sweeping changes, lest they be regarded with suspicion, and we are hopeful that such suggestions as may be made will be accepted not only as safe, but as likely, if adopted, to be attended with excellent results. What seems to us a valid reason will be furnished for every step that it is proposed shall be taken, if out of the ordinary lines.

In Fig. 7 is shown a broken cross-section of a kiln wall, the base of which shows a thickness of thirty-two inches, and the upper portion above the furnace line twenty inches.

Taking the upper section in view, "a" represents an outer wall of common brick. "b" a hollow block section, the blocks being 4x8 inches, with walls one inch thick. "c" represents a lining of fire clay blocks, in dimension 4x8x12 inches, each having a chamber as indicated by the dotted lines, leaving the walls of the block two inches thick on all sides but the bottom—these blocks should be made to correspond with the curve of the kiln walls. The common brick may be laid with common brick mortar, if of equal parts of lime and water, lime or hydraulic cement all the better. The hollow block section will be preferably laid in a fire clay slush, while the fire clay lining blocks may and should be set without mortar of any kind; as a substitute for mortar, however, strips of "asbestos fire felt" eight inches wide should be laid between each layer of the blocks, the thinnest kind (three thirty-seconds of an inch thick) will answer as its use is to make an air-tight joint that will not crumble when expansion from heat takes place. At the ends of the blocks a piece of the same felt cut to correspond with the shape of the end of the block should be made to do duty at that point and the blocks as laid should be simply set against the felt without any purpose of compressing it. This makes an elastic end-joint that permits of the expansion of the block lengthwise without any disintegration of joint. The block thus having room for expansion and being made for the circle on which it is laid, will have no tendency and no provocation to "buckle." It will be remembered that 2,000 degrees of heat will expand each of these blocks (being a foot in length) one-sixteenth of an inch and they should be so laid as to permit of this. Were they laid in mortar and cemented together, the mortar would crumble as the expansion took place and we should have the imperfect joint, and require the application of mortar at each firing of the kiln. It will be essential that each block be laid upon a true bed so that no open joints shall appear anywhere and also essential that the blocks be carefully molded and any excrescences be removed before laying, for the value of the kiln will be largely increased or diminished as the laying of this fire clay course of blocks is well or poorly done, as upon its being properly done depends the question whether the heat of the kiln has access to the hollow block course occupying the wall center. In our sketch it will be seen that in the lower section of the wall there is a second course of hollow blocks. This may be omitted if not thought necessary. But as such a course need cost no more than if of brick, and as it certainly has value especially at points next the furnace, it is deemed desirable. At points where the hollow blocks abut a furnace, the blocks may be set on end, so sealing the chambers.

In considering the care demanded in the laying of the fire blocks, it will be well to remember two things. First, the nature of the returns or compensation for such care, which should mean on a twenty-five foot round kiln or a square kiln of equal dimensions a saving of at least two tons of coal at each burn, and so resulting in a saving of fifty to 100 tons per annum. Second, as against kilns built after the usual fashion, the wear and tear of which was described in the early part of this paper, which is practically eliminated by making the fire clay lining independent, the life of a kiln should be doubled, which, as it is usually estimated that the life of a kiln will average only about ten years, if we add cost of repairs made meantime, will mean not less than a ten per cent. annual return on the entire investment, say nothing of improved results from the use of a kiln in uniformly better condition for doing its work. In our next we will treat of kiln arches and crowns.

FLAME.





\*Trans., xxiv., p. 54.



and 2¾ inches in height. The results given in Table II. show that the choice was a correct one.

This table represents eight cones, made up from a sample of the mixture, which had been moistened with water containing a small amount of dextrine. Each cone, when dried, was first weighed then disintegrated by rubbing in a Wedgwood mortar and sifted through the same screens with which the first sizing test had been made; the resulting different-sized particles were then all separately weighed and their percentages calculated. The table shows the figures for 8-mesh and coarser sizes to be irregular. This was to be expected, as a few grains being a little larger or smaller than the average would cause a considerable difference in the percentage in view of the small weight of the cone. What went through an 8-mesh and remained on a 16-mesh screen showed more regularity; and the sizes from 16 to 60-mesh give very uniform data. That the material finer than 60-mesh should again show some differences was to be expected, as the fine clay-substance, adhering more or less to the coarser grains, could not be evenly separated by mere rubbing, which is all that can be used.

As the Seger cones for refractory clays, Nos. 26 to 36, are only ¾-inch at base and 25-32- inch high, large-size refractory cones had to be specially made as standards for the tests. The Deville furnace, and the crucibles, with their lids and supports, were of the same general character as those described in a previous paper;† only, the dimensions were larger. The furnace, of ½-inch sheet-iron, was 25 inches high and 12 inches in diameter; the cast-iron plate, 3¾ inches from the bottom, was 1 inch thick, had a central opening 2 inches in diameter surrounded by four rows of ¼-inch holes. The lining, of sintered magnesite from the Fayette Manufacturing Company, Pittsburg, Pa., was 3¼ inches thick at the bottom and 2¾ inches at the top, making the inner dimensions of the furnace: diameter at bottom 5½ inches, at top 6½ inches, height 20 inches. The inner diameter of the air-inlet pipe was 1 inch. The outside dimensions of the crucibles were: diameter 2½ inches, height 3 inches, thickness of wall ¼ inch; the thickness of the lids ½ inch: the size of the supports: diameter 2½ inches, height 2¾ inches. The method of firing differed slightly from that pursued with the small furnace. With the latter the blast is slowly started, 30 grammes of paper are ignited and pressed down into the furnace, and then 200 grammes of charcoal are charged, to be followed by the required amount of gas-carbon. In the large furnace the space around the crucible-support was filled with small-size gas-carbon (about 40 grammes) before the paper (50 grammes) and charcoal (250 grammes) were introduced to kindle the increased amount of gas-carbon. Table III. gives the leading details about the manner of working with the furnace.

TABLE III. OPERATION OF THE TESTING-FURNACE.

| SEGER CONE. |                    | FUEL CHARGE.   |                    |                     | Blast Pressure, Inches water. | Furnace, Initial Condition. | Time required for Experiment, Min. |
|-------------|--------------------|----------------|--------------------|---------------------|-------------------------------|-----------------------------|------------------------------------|
| No.         | Form After Fusion. | Paper Grammes. | Charcoal, Grammes. | Gas Carbon Grammes. |                               |                             |                                    |
| 26..        | Lenticular.        | 50             | 250                | 2900                | 2                             | Cold.                       | 60                                 |
| 31..        | Globular.          | "              | "                  | 3750                | 3                             | Hot.                        | 50                                 |
| 32..        | "                  | "              | "                  | 4000                | 3                             | Cold.                       | 55                                 |
| 33..        | "                  | "              | "                  | 2300                | 3½                            | Hot.                        | 35                                 |
| 34..        | "                  | "              | "                  | 2400                | 3½                            | Hot.                        | 40                                 |

The charcoal was passed through a small Blake crusher, set to 1½ inches, and then sifted through a 3-mesh screen, and the fines discarded. The gas-carbon was broken in the same way, and screened through a 1-mesh sieve. The under-size was passed through a 3-mesh screen to remove the fines. What

†Trans., xxv., p. 5.

remained on the 1-mesh sieve passed through the Gates laboratory-crusher, set to ¾-inch, and was then used for filling the space around the crucible-support, or reserved for the small Deville furnace.

Table IV. gives the results of fusing and fluxing tests of mixtures just as they are to be used in making bricks, blocks, pots, etc., and of the same mixtures ground fine, as is the usual custom in laboratory tests. It shows only a slight difference in the results, and proves that, in testing fire-clay mixtures, the samples can be safely ground fine and compared with the small-size Seger cones in the ordinary Deville furnace. Exceptional conditions only would make it necessary to test the mixtures just as they are going to be used.

TABLE IV. COMPARATIVE TESTS OF THE SAME MATERIAL IN NATURAL CONDITION AND FINELY GROUND.

| MIXTURE. |                           | MATERIAL AS RECEIVED.                 |                                                                | SAME MATERIAL FINELY GROUND.          |                                                                |
|----------|---------------------------|---------------------------------------|----------------------------------------------------------------|---------------------------------------|----------------------------------------------------------------|
| Mark     | Tested for Resistance to. | Fusing test, equal to Seger Cone, No. | Fluxing test, Grammes of Ca CO <sub>3</sub> to 1.5 of Mixture. | Fusing test, Equal to Seger Cone, No. | Fluxing test, Grammes of Ca CO <sub>3</sub> to 1.5 of Mixture. |
| A.....   | Heat.                     | 34                                    | .....                                                          | 34                                    | .....                                                          |
| B.....   | Heat and fluxes           | 33                                    | 0.155                                                          | 33                                    | 0.160                                                          |
| D.....   | Heat.                     | 34                                    | .....                                                          | 34                                    | .....                                                          |
| E.....   | Heat and fluxes           | 34                                    | 0.180                                                          | 34-33                                 | 0.180                                                          |
| H.....   | Heat and fluxes           | 33-34                                 | 0.160                                                          | 33-34                                 | 0.160                                                          |
| No. 1.   | Heat and fluxes           | 31                                    | 0.100                                                          | 30                                    | 0.120                                                          |

Note by the Secretary.—Comments or criticisms upon all papers, whether private corrections or typographical or other errors, or communications for publication as "Discussion," or independent papers on the same or a related subject, are earnestly invited

JONAH COUGHED UP AGAIN.

Jonah was an unwilling guest. He wanted to get out. However much he may have liked fish, he did not want it three times a day and all the time. So he kept up a fidget and a struggle and a turning over, and gave the whale no time to assimilate him. The man knew that if he was ever to get out he must be in perpetual motion. We know men who are so lethargic they would have given it up, and lain so quietly that in a few hours they would have gone into flukes and fish-bones, blow-hole and blubber. Now we see men all around us who have been swallowed by monstrous misfortunes. Some of them sit down on a piece of whalebone and give it up. They say: "No use! I will never get back my money or restore my good name or recover my health." They float out to sea and never again are heard of. Others, the moment they go down the throat of some great trouble, begin to plan for egress. They make rapid estimate of the length of the vertebrae, and come to the conclusion how far they are in. They dig up enough spermaceti out of the darkness to make a light, and keep turning this way and that, till the first you know they are out. Determination to get well has much to do with recovered invalidism. Firm will to defeat bankruptcy decides financial deliverance. Never surrender to misfortune or discouragement. You can, if you are spry enough, make it as uncomfortable for the whale as the whale can make it uncomfortable for you. There will be some place where you can brace your feet against his ribs, and some large upper tooth around which you can take hold, and he will soon be as glad to get rid of you for a tenant as you will be glad to get rid of him for a landlord.—Exchange.

STRIKER OUT.

When striking workmen tramp the street,  
With ordered ranks and marching feet,  
And ask that higher wage be paid,  
'Twould seem that they were on pay-raid.  
—Good Roads.



# AT CHRISTMAS TIME

## A BRICKMAKER'S REVERIE BY B. J. DUNN

JO SET yer feelin's all achime,  
Haint nothin' ekals Chrismus time.  
Talk erbout Thanksgivin' spreads,  
'N banquets whar ther folkses heads  
Gits dizzcned with aer flowin' bowl.  
Its jolly, but a feller's soul  
Gits cramped twixt turkey fixin's fine.  
Not jollity, but joy's ther sign,  
At Chrismus Time.

Joy 'n' peace is in the air,  
World hez lost its ugly stare,  
Folks is smilin' like they'd been  
Freed f'om every trace of sin.  
Out of toil men comes ter rest  
With ther friends thet loves them best.  
Noisy mills hev fallen still,  
Peace is queen of vale and hill,  
At Chrismus Time.

Tell you what it is, ther haint  
No man 'thout some little saint  
In his makeup, way down low,  
Waitin' just a chance ter grow.  
Wustest man I ever knew  
Told me oncet a year ther grew  
On his heart a sofinin' glow  
Somehow like the long ago,  
At Chrismus Time.

Chrismus never can forget,  
Long gone days are with us yet,  
Friends who loved us come again,  
Join us in the joyous strain.  
Faces dear, long 'neath the sod,  
Souls that sing glad hymns with God,  
Sound with us again, the song  
Man has sung for centuries long,  
At Chrismus Time.

Eyes shet, I kin see 'em yet,  
Chrismus friends that with us met.  
Sleigh bells ringin' o'er ther snow  
Brought 'em many years ago.  
At the door they stopped awhile  
Fer mother's kiss 'nd father's smile.  
Open house was our'n just then  
Free and welcome to all men  
At Chrismus Time.

All the fam'ly, young 'nd old,  
Gathered to that first, dear fold.  
Then come others, lone and poor,  
Ter share the joy within our door.  
Feeble wrecks of stalwart men,  
Quaint old aunties joined us then,  
While ther great board fairly bent  
With luscious fare, thet God had sent,  
At Chrismus Time.

Romped, we kids did, all the day,  
While the old folks talked away.  
Told of toil and pains long past,  
Of their youth, too sweet to last.  
"Feeble Jones" got young once more  
And burned brick kilns by the score.  
Dad woke up and showed how spry  
He'd made brick in days gone by,  
At Chrismus Time.

Johnson got to shov'lin' mud,  
Beat 'em all, till old man Flood  
Told 'em how at wheel and toss  
He coopered Simpson's bully, Foss,  
And quiet little Elder Brown  
Recalled the n' t the kiln fell down.  
And none paid need to Alec Gray,  
Who mourned because brick didn't pay,  
At Chrismus Time.

Aunty Jones, she told us then,  
How she cooked grub for thirty men,  
All alone, when they made bricks  
Out in Brewer in fifty-six,  
And dear Aunt Hanna told also  
When grandpa failed in Chicago,  
And then the conversation bore  
On those who'd meet with us no more,  
At Chrismus Time.

'Nd pa'd hev trouble with his sight  
'Nd ma'd pertend the Chrismus light  
Need tendin' to, 'nd silenc'd fall  
Around the circle; one 'nd all,  
'D sit as if they wuz away  
In thought, to some past Chrismus day;  
Till silence fled at some loud sigh,  
'Nd light came back, 'nd gloom passed by,  
At Chrismus Time.

'Nd then we'd gather for the feast;  
Each heart was full of peace at least,  
And quiet joy, as saints must feel,  
If e'er in Heav'n they sit at meal;  
'Nd pa'd say grace, and ask that we,  
For what we got, would thankful be;  
'Nd with what soulful, sweet, Amen  
We answered his "Good will to men,"  
At Chrismus Time.

Joy 'n' peace wuz in the air;  
World had lost its gloomy stare;  
Sunshine shone through all the earth;  
Bygone days brought back their mirt'n;  
Folks they laughed as if they'd been  
Washed of every selfish sin.  
Tell you what, ther haint no time  
Kin set yer sperrits all achime,  
As Chrismus Time.





Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 9.

Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

PITCHERS.



ANY OF THE AMERICAN views produced by old English potters are found on pitchers only, while others occur on teapots, bowls and mugs. A large number of these prints were also placed on plates and platters. This somewhat indiscriminate use of entire engravings, or portions of the same, renders the work of classification somewhat difficult.

For the sake of convenience in cataloging or describing, pitchers may be arranged in groups, according to form. The variations in shape are so numerous, however, that we shall only attempt to classify them according to well-marked characteristics. By the process of elimination the number may be reduced to eight distinct types, and under these all modifications may be placed.

TYPE I. The colonial form is the purest example of this type, as illustrated in the old Liverpool cream ware, includ-

TYPE IV. Similar in shape to Type III, variety a, with handle which deviates more or less from the plain curve, terminating at the ends in recurved points. At the base is usually a slightly projecting edge. This form is usually found in dark blue.

TYPE V. This form is distinguished by a large protruding lip and broad base, with handle which rises above the top, generally surmounted by a thumb-stop, or point. The outline of the body is irregularly curving and ungraceful. Pitchers of this form are generally found in dark blue.

TYPE VI. This is somewhat flattened at the sides, with angular outline and high-pointed handle. The lip is large and protruding and the base narrow and slightly curving outward. The upper edge is usually waving.

TYPE VII. Copper luster pitchers are frequently of this form. Below the globular body is a contracted ankle terminating in a circular foot. The lip is curved downward, the neck large, flaring and often corrugated, while the handle is boldly scrolled.

TYPE VIII. The main feature of this type is its hexagonal or octagonal form. The handle rises slightly above the top and possesses several recurved ornaments. Sometimes the ankle is lacking, the six or eight flattened sides continuing to the base.

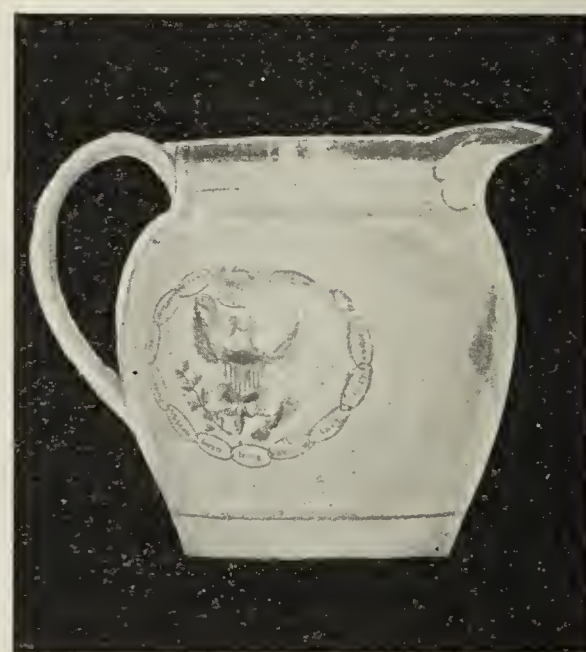
Other forms of pitchers are found in collections of old china, the majority of which are variations of the eight typical



Washington Pitcher, Type I.



Franklin's Tomb, Type II.



American Heroes (Van Rensselaer, Adair, etc.) Type III.

ing what are generally known as Washington pitchers. This form is tall and graceful, with curving and recurving outline, swelling at the center and widening out again at top and bottom. The nozzle is sharp and angular, the upper line being a continuation of the straight margin of the upper edge, while the plain, bent handle rises to the same level. Some of the Staffordshire forms were modifications of this, being somewhat lower and broader. All of these may be included in the same group.

TYPE II. The distinguishing feature of this type is its barrel shape, the outline of the sides being a continuous curve from top to bottom. The handle is plain, as in the former type, and the nozzle is either sharp or slightly curving downward. Pitchers of this form are generally in dark blue.

TYPE III. Variety a. This is characterized by a straight, vertical band, or collar, at the top, of varying width, and plain, curving handle, similar to that of Type I. The nozzle is usually slightly curved and outlined with raised ornaments. Pitchers of this type usually have some metallic luster. Variety b. By cutting off the lower third of this form we have a squatty pitcher with broader base, as seen in the "Perry" jug. The nozzle is plain and pointed.

shapes described. Some of the forms of pitchers or ewers belonging to toilet sets, however, are entirely different from any of these, but since they are not generally admitted to private collections, it is not considered necessary to notice them here. The Sebastopol pitcher is a striking example of this class.

In the list of pitcher designs which follows, no attempt has been made to group them according to form, for the reason that many of the prints are known to occur on several different shapes.

—List of American Designs Which Occur Principally on Pitchers and Jugs.—

DESIGNS IN DARK BLUE.

American Heroes. Names of Washington, Truxton, Jones, etc. (Type V.).

Arms of the United States. Large eagle, shield and flowers. Lafayette (portraits). "Welcome, Lafayette, the Nation's Guest," etc.

Lafayette (portraits). "Republicans are not always ungrateful."

Lafayette (portrait). "Welcome to the Land of Liberty."



Lafayette and Washington. (In commemoration of Lafayette's visit in 1824).

Mount Vernon. "Washington's Seat." (Washington mounted).

"Prentiss, Henry, success to, and his employ. 1789." (Dark blue, floral designs).

Washington standing with scroll in hand.

#### DESIGNS IN VARIOUS COLORS.

Arms of the U. S. (Buzzard, Cannon, Flag, etc.), in colors and luster.

American Heroes. Names of Izard, Van Rensselaer, Adair, etc. (Type III, a.)

"America, whose Militia is better than Standing Armies." (Cannon, flags, etc.)

Baltimore (View of).

"Constitution" taking "Cyane" and "Levant."

"Constitution" leaving Boston harbor.

"Constitution's escape from the British Squadron after a chase of sixty hours."

a. Cornwallis, Surrender of (with inscription). Red, black and luster.

b. Cornwallis, Surrender of; same, on yellow ground.

c. Cornwallis, Surrender of; same, on blue ground.

Decatur, Commodore (bust and name); red print on yellow ground.

"Enterprise" and "Boxer," combat between.

Peace, Plenty and Independence; Eagle and Female Figures (yellow).

Perry, O. H., Esq., "Hero of the Lakes."

"Perry's Victory, Second View of Commodore."

Soldiers (U. S.) "By Virtue and Valor," etc.

"United States" and "Macedonian," combat between.

Washington and Lafayette. "Lafayette, the Nation's Guest," etc. "First in War," etc.

"Washington his Country's Father." "First in War, First in Peace," etc.

Washington (bust, with military hat).

"Wasp" and "Frolic."

"Wasp" and "Reindeer."

Many of the designs previously listed, as occurring on plates and other pieces, are also found on pitchers. They are not repeated in the foregoing list.

EDWIN ATLEE BARBER

#### ST. LOUIS NOTES.

THE FACE BRICK in the new armory, designed by Wm. L. Bulkley, architect for Battery A, has been changed from Hydraulic No. 504 to a gray mottled brick made by the Illinois Supply and Construction Co. There was some difficulty with the shading of the brick required by the architect, which the Hydraulic Co. said could not be furnished, but which the Illinois Supply and Construction Co. readily agreed to supply, as it was merely kiln run that was wanted. This will be quite a handsome structure and a card for any brick.



Landing of Lafayette, Type IV.



American Heroes, (Washington, Truxton, Jones, etc.) Type V.



Landing of Lafayette, Type VI.

a. Harrison (Gen'l W. H.), portrait in black; Log Cabin, Eagle, Inscriptions. "Harrison and Reform;" "Union for the Sake of the Union." Luster (Type VIII).

b. Harrison, same—"To Let in 1841." Luster, and green ornaments.

c. Harrison, same—"Our Country's Hope." Luster, and black spots.

d. Harrison, same—"Union for the Sake of the Union." Luster and yellow band.

e. Harrison, same—Portrait in pink. Luster.

Jackson (Portrait of Gen'l Andrew), "Hero of New Orleans." Luster, blue ground.

"Jackson, Major General Andrew" (portrait).

Lafayette (portrait), "Welcome, Lafayette, our Nation's Guest."

Lafayette (portrait). Reverse, Surrender of Cornwallis.

Lawrence and Decatur.

Lawrence (portrait of Commodore James), "Don't surrender the Ship."

"Macdonough's Victory on Lake Champlain, Sep. 11, 1814."

Macedonian," commanded by Capt. Jacob Jones.

Odd Fellows (copyrighted 1845); in colors.

This brings to the front the idea of getting away from the prevailing monotony of an even-colored selected front brick for a building. There is no reason why the Western architects should hang to the old idea of even color any more than they do in the East. If there was any beauty in it the case would be different. We are all trying to imitate nature; we cannot improve on it, and when we look out over the green fields or ripening grain we find a difference in shade. A leaf is not the same color on both sides, or at both ends. Stone quarried from the same ledge has different tints and shades; then why should the poor brickmakers, as they are in this city, for the sake of uniformity be compelled to furnish a rear wall of common brick "even color?" When it comes to the front of a building, what do we get? Even shade  $\frac{1}{4} \times \frac{1}{4}$



for the improved appearance it will give to the buildings using unassorted brick.

This might be made a subject for the next Convention of the N. B. M. A. It applies to common brick in some localities and to face brick in all.

Mr. Keller, of the Ross-Keller Machine Co., is in Texas, and expects to book another order for a six-mold press for the Green-Hunter Co., of Thurber, Texas, which will make three sold to this concern.

McEwing & Thomas booked a large order for buff brick for the Hoxie Building, at Fort Worth, Texas. The Atlanta Terra Cotta Co., at Atlanta, Ga., secured the terra cotta contract at less than half the amount bid by St. Louis concerns.

St. Louis, Dec. 15, 1898.

A. SAINT.

Written for the CLAY-WORKER.

#### A BRICK FACTORY IN A WOODEN TOWN.—No. 9.

**I** HAVE NOT had many opportunities to observe other men's methods—a fact which I sincerely regret. I think that much knowledge we have been forced to learn in the costly school of of experience might have been gained much more readily and cheaply by comparing notes and experiences with our brother brickmakers. Original ideas are good things in their place, and play an important part in the world's progress. All honor to the man who originates an idea in brickmaking or in any other field of industry or science which helps to make the world move. But the man who discards or disregards the experience of ages and depends upon his originality to run a factory will fail to sell many bricks. This is true in every department of the work, from the clay bank to the kiln.

If you need a piece of machinery to do a certain kind of work, it will generally pay to look over the advertising columns of The Clay-Worker, select something warranted to do your work—and nine times out of ten the machine will do it to your satisfaction, and you can make enough bricks to pay for it twice



Surrender of Cornwallis, Type VII.

during the time you would spend in making something from your own plans, that nine times out of ten will fail to do the work well, and be a continual source of annoyance and loss as long as you keep it in your factory. We needed a clay elevator, and, like, many others in our business, concluded we could

make one. We made one of a piece of belting we had on hands, but it was a failure. We made another of chain belting—likewise a failure. We constructed a tramway, put bottom-dump cars upon it to carry the clay, but, of course, we would then need a winding drum. We finally succeeded in making a good one, and it is still giving satisfaction, but, first and last, it cost



Gen'l William Henry Harrison, Type VIII.

us in delays and remodeling twice as much as a new one from the factory. While, taken all together, our different plans and failures on the subject of elevators cost so much that we have never figured out how much it was, we have quit inventing. Inventors are all right, and, as clayworkers, we cannot do without the products of their genius. But we have not had any flattering success in that line, and are so busy making brick that we cannot afford to take the time to plan a machine simply for our own use, when there are better ones on the market at low figures and warranted to do the work. We do not mean to discourage the brick-maker who has a good idea and finds it of so much help to him that he takes the trouble to give it out to the craft in general as a patent or otherwise. But I want to emphasize the fact that the business of the brick-maker is to make bricks—make them good and sound to endure the storms of ages to come, and sell them at a good profit. Never lose sight of the sales and profits question. That, after all, is perhaps the hardest question we have for our solution, and I will make no attempt to solve it here. Local conditions of supply and demand, the character of the competition to be met, transportation facilities, the state of the manufacturer's finances; in fact, so many matters purely local enter into this question that a man in St. Louis or Chicago can give advice only in a general way to the manufacturers of other places. But I think it a safe principle for all places and all manufacturers never to sell except at a profit. If there is to be any loss from cutting prices, manage to let the other fellow lose. The careful brickmaker can calculate to within a few cents the cost per thousand for manufacturing, and should take care to lose a contract rather than to lose hard-earned dollars. But I am straying from my text—help obtained from the experience of others. Go to the successful man for helpful ideas. Our experts who had spent a lifetime in the business, and never had made enough money to own even a small yard, proved very poor help. In taking advice one must learn to discriminate or he will be like unto the Irish mother who tried, in the course of a day, all the remedies suggested by her neighbors for the burnt child, and found them all failures. Herein lies the great value of a publication like The Clay-Worker. Articles from the pens of such men as Morrison, Eudaly, Prof. Orton and many others have the weight to be gained only from successful experience and scientific knowledge. We cannot afford to think we have learned it all. There are too many



complex problems in the clayworker's experience to be solved in one short lifetime. One by one, we aim to meet the difficulties that present themselves, sometimes successfully, sometimes only partially, and sometimes we make complete failures. But patient, intelligent labor will accomplish all things. Whether we are treading the dark paths of experience or walking in the light shed by the experience of others, eternal vigilance is the price of successful brickmaking. L. C. M.

### BRICKYARD CONSTRUCTION.

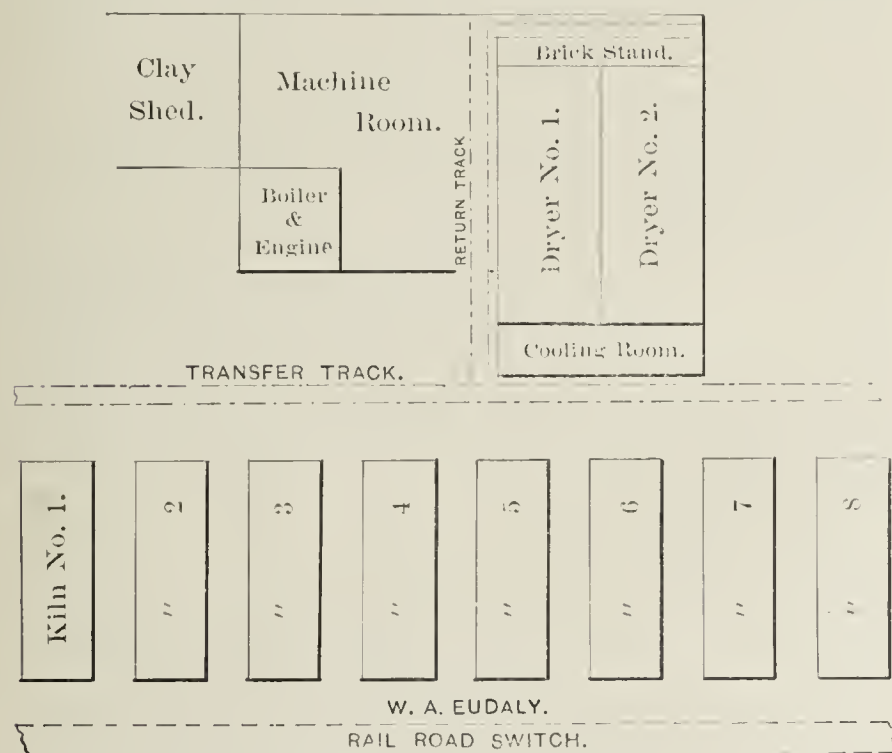
#### Convenience in the Arrangement of a Plant Means Economy in Operative Expenses.

**I**N CONSTRUCTING up to-date brick plants strict attention should be paid to the planning and arrangement of the buildings, with a view to economizing the time and work of employes

The accompanying sketch shows the ground plan of a very conveniently arranged paving brick plant using down-draft kilns and dryers:

The clay may come from either side or from the rear of the plant without material alteration. None of the workmen in the several departments as the clay pit, machine room, setting, burning, emptying and loading need to come in contact with each other.

Every plant should be planned and constructed so as to prevent as far as possible the interfering of the workmen of one department with those of another. When this idea of



separating the departments is carried out, it becomes practicable to set a certain amount of work in each department to be done each day. It also facilitates the matter of keeping a separate account with each department.

The habit of constantly shifting the men from one department to another causes more confusion and loss of time than any other one bad habit on a brickyard. To avoid this confusion and loss the yard should be planned so that each department can be run separate and apart from another, for unless a brick plant is properly planned it is very difficult, if not impossible, to separate the daily costs of running each department. And unless the manager has a fair idea of what each department is producing and costing from day to day he cannot introduce such reforms as will make for the good of the concern.

Five or ten years ago the average brickmaker made no pretensions of knowing whether he was losing or gaining ground until after the close of the season's business, and, "cowboy" like, until he had made a general round up. If then he finds

he has a good balance he is still at a loss to know why, or if he has made a loss he is more than likely unable to locate the cause. Any one of a badly located and equipped clay bank, poor and illy-planned machinery, an expensive drying system, poor kilns or poor fuel, to say nothing of unorganized labor, may be the principal cause of the failure, or at least may hinder reasonable profits from year to year. Yet all the time the real cause may go undiscovered for the want of a proper division of the manufacturing process into departments with separate and accurate accounts kept with each.

I believe that most every one tries mentally, at least, to make occasional reckonings with the several departments, and may thereby be able to make changes for the better. While such spasmodic mental efforts may give some little temporary relief, they have no permanent record for a guide at another time. Besides, how can the most capable carry in his mind the amount of labor or cost of any particular branch of a business consisting largely of labor, when the laborers or labor is so interwoven one part with another that the workmen themselves cannot, at the close of day, define definitely just how he has spent his time?

Accurate records should be kept of the labor performed and results accomplished in each department each and every day. The reasons for all causes or delays should be briefly but accurately noted. These daily records should be kept in convenient form, so that comparisons can be easily and often made. The most painstaking and accurate records are of very little value unless used for reference day by day.

Not long since a prominent brickmaker stepped into my office, and among other things stated that his bookkeeper was required to make a complete trial balance every week. And that this trial balance contained a complete inventory of all bills payable and receivable together with a full statement of the fuel and stock of every kind on hand. He said that his company knew once a week just how they stood.

It is needless to add that this firm is successful financially and otherwise. They know exactly what their product costs. CINCINNATUS.

### CERAMIC ASSOCIATION, OHIO STATE UNIVERSITY.

**A**T THE THIRD regular meeting of the Ceramic Association, held November 8, after the transaction of routine business, Mr. G. A. Davis read an instructive paper on "Clayworking at Shawnee." He detailed the methods used in the manufacture of the well-known Shawnee brick, following the work from the mine to the finished product. This was followed by a paper by President Barringer on "A Misunderstood Value of Chemical Analysis," in which the point was clearly brought out that chemical analysis can be of great value or of little value, according to whether its results are properly interpreted and used, or whether the analysis in itself is expected to make known to anyone, at a glance, what the properties of any particular clay are.

The program of the fourth regular meeting, held November 22, was opened by Mr. L. R. Berkey, who presented a paper on "The Dehydration of Clays," based on experiments recently made by the class in ceramics, and bringing out some interesting data in this line.

Mr. R. C. Purdy followed with a minor paper, written in his usual clever style.

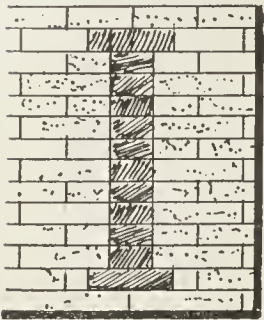
The work of the association is progressing in a very satisfactory manner. The members are all looking forward to the meeting of the National Brick Manufacturers' Association in Columbus with much interest. They all hope for the privilege of attending the sessions, and expect to gain many valuable hints from the speakers, who, no doubt, will discuss the subjects considered from a purely practical standpoint.

NOVICE.



Written for the CLAY-WORKER.

## THE CLAY INDUSTRIES IN THE EASTERN COUNTRIES OF EUROPE.



IF WE review the development and the present stage and condition of the European industry in general we find that the development of the several industrial branches in the different countries and at different times has not proceeded at the same rate. It is remarkable and interesting how the brick industry, compared with other crafts and considering its tremendous

importance in regard to the most necessary requirements of human life, as well as the wide distribution of its raw material, could attain such a great age, without, for millenniums, emerging from the most primitive methods of manufacture and without showing any special progress.

For the cause of this we must look to the difficulty in transporting its wares; for this reason the industry always depended upon local markets, and had to fear no competition. Good ware or bad always found consumers, and there was no necessity to meet and to defeat competition.

The clay, and especially the brick industry, owes its extraordinary and rapid development to the great improvement in economic and social conditions, to the rapid increase in population, to the tremendous growth of the cities, to the extension of other crafts, especially of mining and metallurgy, and other highly important factors. The rapidity of development is due mainly to the fact that these improvements took place within a short period.

The conditions for the existence of the industry, like days and years, depend upon great world-moving factors. Communication produces civilization. The extensive changes in the conditions of transportation and consumption by means of the extension of railway systems have brought in the field of ceramics the home and foreign competition into a different relation. As we, in this last third of the century have seen the highest development of the brick industry in the different, more progressive countries of the western half of Europe, so now the same phenomenon is repeated in the eastern countries, which are beginning to enjoy the blessings of more extensive means of transportation.

Since about two years a general activity is making itself felt in all the countries of the old world, in all industrial departments, and especially Germany, the heart of Europe, gives the most forcible evidence of its industrial energy. The constant demand for building material and all ceramic products causes many large clay working establishments to be built in all parts of the empire, thus showing confidence in the future of these satisfactory economic conditions. In all this extraordinary activity pervading Europe our attention is especially drawn to Austria, Hungary, Germany's eastern neighbor, and the great empire of Russia. The peculiar development of these countries is explained by the peculiarities of their social and economic conditions. Interesting for us are the different means by which the governments of Hungary and Russia endeavor to stimulate industrial activity.

In Hungary the government offers to new industries, that is, industries as yet not represented in the country, land along railways or waterways, free of charge and exempt from taxes for twenty years. It also supports certain enterprises with money, like Russia, as will be described later on.

But all such artificial means have but little practical success to show, as little as the establishing of trade schools before there is a demand for them, and even where the government owns certain industrial establishments entirely, as is the case in Russia, where the authorities of several districts operate brick and roofing tile plants, the result is, as a rule, no direct

profit to the government, nor a decided advantage to the country in general. In localities where such government establishments exist, the selling prices of the latter are too low for private enterprise, and hence the tendency to private competition is suppressed.

That group of phenomena, so intimately connected, which is the primary cause of the elevation from one economic stage to the next higher one, has produced in Austria-Hungary, first of all, a more lively building activity, which again is the promoter of the ceramic branches connected with building. For this empire, so richly blessed by nature, the extension of its railway systems and the connection with the oriental railways, was and is of the greatest importance, for the orient is thus placed directly before its door as once before the harbor of Venice. The great number of railways, their advantageous position along the Danube, the growth of the two capital cities, the erection of palaces, churches, government buildings, city railways—Budapest, in the year of its millenium, 1896, has opened under its streets the first electric underground railway in Europe—have caused a great increase in the production of brick not only near the capitals, but the example has also influenced all the other cities of the country in a beneficial manner.

One makes peculiar observations in Austria. With the establishment of great brick plants the continuous kiln was adopted everywhere but the manufacture of brick by steam driven machines was introduced very slowly, and even to-day Vienna contractors prefer to a large extent the hand-made brick, made in the old Babylonian style, to that produced by machinery. Oddly, one hears there the same prejudices which were prevalent in Germany, at least for a short time, about thirty-five years ago, that a machine-made brick could not be cut so easily as a hand-made one and that the mortar and plaster do not adhere as well to a machine brick as to the hand-made product.

While in Germany the hand molders are recruited chiefly from the small domain of Lippe-Detmold, who mold their brick in molds without a bottom, with water, which gives to the brick a smooth surface, the Austrian brickmakers, who, for the most part come from the district of Udine, in upper Italy, and from Bohemia, used a mold with bottom, which they always clean with water, but which they sand every time so that the brick receives a rough sand surface. Of course the plaster adheres well to these brick. Thus in Austria, where, by the way, a certain tendency to stick to the old is very strong, the change from the hand-made to the machine-made brick, to the sorrow of the machine men, has not been as easy and energetic as in Germany. But the steady increase of wages, already noticeable in Austria, together with the law of the present civilization, that all severe manual labor is to be performed by machinery will soon create a change in this respect. The manufacture of hand-made brick is generally done by the thousand. For a thousand of dry brick from \$1.25 to \$1.62 is paid. The other manipulations are likewise paid for by the thousand. A common laborer receives per day of ten or eleven hours from forty to fifty-eight cents, depending upon the season and the demand for help.

The consumption of brick in Vienna some forty-five years ago amounted to 100,000,000 brick per year, but now from 250 to 275 millions are used. The increase in consumption was not a steady one, but on the contrary, like the prices, it was subjected to great fluctuations. The maximum of consumption, 300,000,000, was reached in 1872, the minimum, about 90,000,000, in 1853, and another small consumption, 150,000,000, in 1880. The prices fluctuate very irregularly between 14 and 15 florins (\$5 to \$7) per thousand, delivered at place of building. During the extraordinary building activity of 1873 the prices were much higher, up to 38 florins and even more than that in some cases.



The last years have given to Vienna a strong building impetus, a fact which has a favorable influence upon the other parts of the country. It is to be hoped that this pleasing state of affairs in the beautiful and art loving city will continue also after the close of the present Jubilee Exposition, and that the bitter struggle between Germans and Czechs in Austria may soon be ended without the great injury to the economic conditions of the country which is feared at present.

A picture much different in character is shown us by Austria's sisterland, Hungary. Five years ago we celebrated the 5th century since the discovery of America by an exposition which it will be hard to surpass; in 1896 Hungary celebrated the thousandth year of its existence. Deserving of admiration is the rapid change which has taken place in Hungary. With the powerful, growing national pride was awakened also the industrial power. Thirty years ago still an agricultural country, it has now emancipated itself from Austria, so far that its rapidly grown industries to-day cover the largest part of the home demand and even are able to show most remarkable accomplishments in certain lines.

Hungary's millenium festival is equivalent, so to speak, with a new step in civilization. The capital, Budapest, has changed most wonderfully during the last ten years; it has been rejuvenated, modernized and beautified by magnificent new streets. It stands a work of its artistic architects, its clay-workers and others connected with building, to whose knowledge and ability it owes this work of modern city construction.

The constant economic development of the country has produced a steady growing spirit of enterprise. The inflow of foreign capitalists and technical men, to whom Hungary had opened a fruitful field of activity gave rise to the formation of stock companies and the erection of many great establishments, whose standard of production has developed to a high one. It was recognized that only plants which satisfied all the technical requirements of modern times could result in good products and good prices for the latter.

Thus, not only Budapest and vicinity, but also the more distant districts of the country can show cement, brick and clay works which in regard to their qualitative as well as quantitative capacities are on a level with the most prominent establishments of the leading countries. The powerful rise of Hungary and the rapid growth of its capital, which far surpasses that of any other European city, as well as many other characteristics of the young national life resemble American working energy and capacity.

Budapest to-day has a population of over 550,000. Already in 1889 it used 150,000,000 common brick, in the manufacture of which machinery is used more extensively than in Vienna.

The prices of brick in the Hungarian capital were subject to great variations; there were times when they could not be sold for 16 florins delivered at site of building and also such when 28 and 30 florins, and more, were willingly paid. Such high prices as were once obtained in Vienna were never known to the Budapest yards. When brick were scarce and prices high all the yards located along the river up to Vienna contributed their share of brick, which they could easily do on account of the low river freight rates.

Roofing tiles, so called "beaver tails," up to the size 6¾ inches by 15¾ inches were subject to less fluctuations in price and were usually kept between 16 and 19 florins per thousand. The manufacture of these roofing tiles is carried on by a very peculiar so-called "house-hold" industry at several places in Hungary where large deposits of a suitable, easily worked clay are found, and where often the entire village is engaged in this business. This was especially true in the district of Poltar in the Neograd Comitatus and Apatin in the southeast of the country.

Even small children, as soon as they are able to handle the green tiles, put on pallets, must do their share in the family work. As soon as a family has on hand a stock of several hundred or thousand dry tiles, depending upon the size of the extremely modest dwelling, the ware is sold to the burner, usually the owner of a continuous kiln, who burns the tiles and furnishes them to the agents or consumers in car or barge loads, at very low prices, or perhaps uses them in his own building operations. This process of making and selling clay ware is very similar to the "household potteries" of China and Japan.

In consequence of the primitive method of working the raw material and often insufficient burning the quality of these roofing tiles is frequently very deficient and the building departments as well as the Budapest architects gladly prefer ware corresponding more to modern requirements, if the price

is within reasonable limits. These reasons have caused the erection of several large clay-working plants equipped with all the advantages of modern technical practice which, like the factory at Selgyst, Neograd Comitatus, to be described subsequently, are devoted mainly to the manufacture of roofing tiles. The accompanying cut shows the front elevation of that important plant.

### ADVANTAGE OF BRICK COMPARED WITH FRAME BUILDINGS.

Editor Clay-Worker:

I see from Clay-Worker for November that the committee has decided on Columbus as the place of holding the next Convention; the location is very pleasing to me individually, as it is convenient, is the home of Professor Orton and his School for Clayworkers, and will perhaps give members a chance to see something of its methods.

As a member of the committee on "Increased Use of Clay Materials," in building, I would like to see the members attend the Convention loaded with facts to present on the subject. I rather think they have been too busy to give the matter the



J. EDSON CLAPP, Vicksburg, Mich.

attention it should have. On this question each member is working for himself as much as when on his yard making brick, as most of us could make more brick if there was a demand that would take them as quickly as made. Brickmaking is heavy, hard work; especially so for the one having charge of the sales department, when the demand is limited, and especially so if the bank account is limited also.

It is my opinion that the brickmakers, by taking hold of this question in earnest, can in some way get the fact before the people wanting homes, that brick are best for the building, and best for them to use. Best because more durable, best for them to use because safer, and in the long run very much cheaper. That question of cheapness is a peculiar one, as it is so easily gotten over and around by people interested. One will value the article by the dollars it cost; another for what it actually is and does for its possessor, so some people value buildings.

The one of wood, costing, say, \$2,000, will be called cheaper



than the one of brick from the same plan and finish costing perhaps twenty-two to twenty-four hundred dollars. The wood building is in danger all the time from fire, both outside and inside, and when burned is a total loss. The brick has practically no fire risk from outside, and that from within is very much less, and in case of a bad fire the brick are still there to start another building with. The wooden building requires constant care to keep it looking fairly well, while the brick improves with age, in appearance.

J. EDSON CLAPP.

Vicksburg, Mich., Dec. 6, 1898.

Written for the CLAY-WORKER.

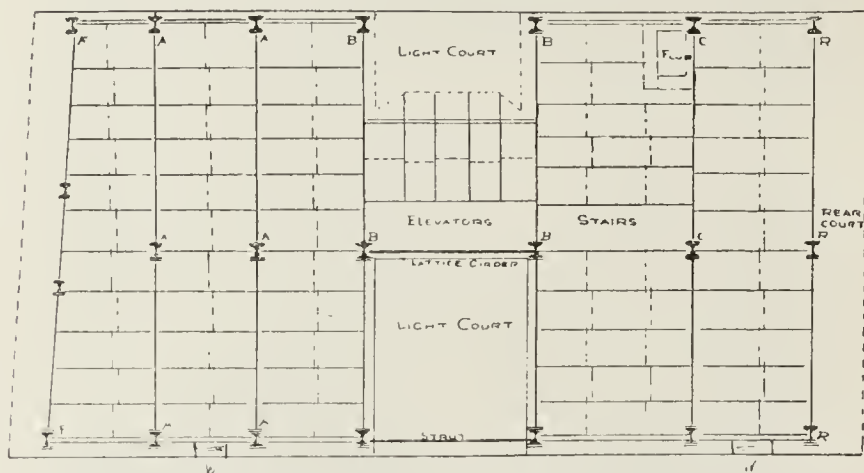
### LESSONS OF A GREAT FIRE.

Burned Clay Fire Proofing Demonstrated To Be Fire Proof.



CLAY AS A FIRE PROOFING material has received a great certificate of character. The recent great fire in New York City demonstrated that clay fire proofing is capable of resisting a serious conflagration when all of the conditions appear to have been right for such a disaster. It is affirmed by many that but for the Home

Life building it is more than probable that a large part of the buildings on the lower portion of Manhattan island would have been licked up by flame. The conditions were these: A cold night, a howling gale, the streets on each side of the car tracks piled up with snow and the Rodgers, Peet & Co. building, immediately north of the Home Life, a fiery furnace, with a blow-



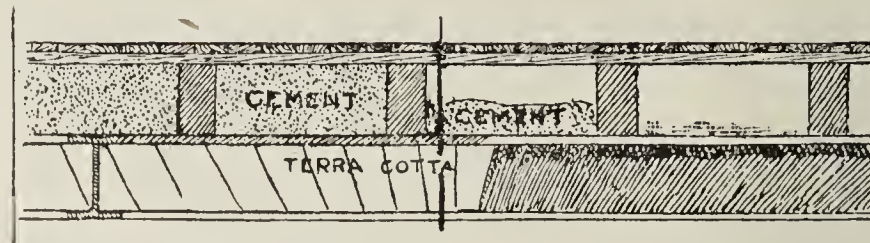
Beam Plan of Upper Stories.

pipe effect through the agency of a howling storm from the north, directed against it.

This fire has great educational value. It developed positive information. It showed at once the strength and the weakness of the Home Life Building. It showed what has been properly done and what was badly done. It indicated clearly enough that a steel frame structure protected by terra cotta will stand uninjured under the blast from a fiery furnace, such as that of December 4. It proved that marble, or other stone, is useless and destructible in a fire. This has always been known, but is reiterated in a graphic and picturesque way in this fire. It is proved that cast iron exposed to heat is little better than weatherboarding, a well-known fact, yet emphasized in this serious episode. The morning after the fire there was the usual talk about the destruction of a fire-proof building and the futility of efforts to build fire proof. Now the facts have proved that in some respects the Home building was fire proof. It has proved that in some other respects it is no more fire proof than a frame house. The pictures in connection with this article show that. In the court we find that there are windows with cast-iron mullions and cast-iron caps, which suffered seriously in this fire. They admitted the flames into the building, and within reach of these openings the flame got in its work. These mullions, as the pictures will show, were nothing but light cast-iron facings backed up with wood.

On the north side of the Home building and adjoining the source of the fire were windows without shutters. We all know

that glass is not fire proof. From the flames which went through these windows and the flames which went through the court the building suffered. Where the structure was covered with brick or terra cotta, or any form of burned clay, it is in good condition. Structurally, the building has not suffered, excepting in the case of the latticed girder indicated by the letter "C" on the section of the court window. The drawings show clearly enough that this was true. There was no fire proofing. It is remarkable, indeed, that a building so important as this, that one so expensive, should have, at the same



The Way it Should have been.

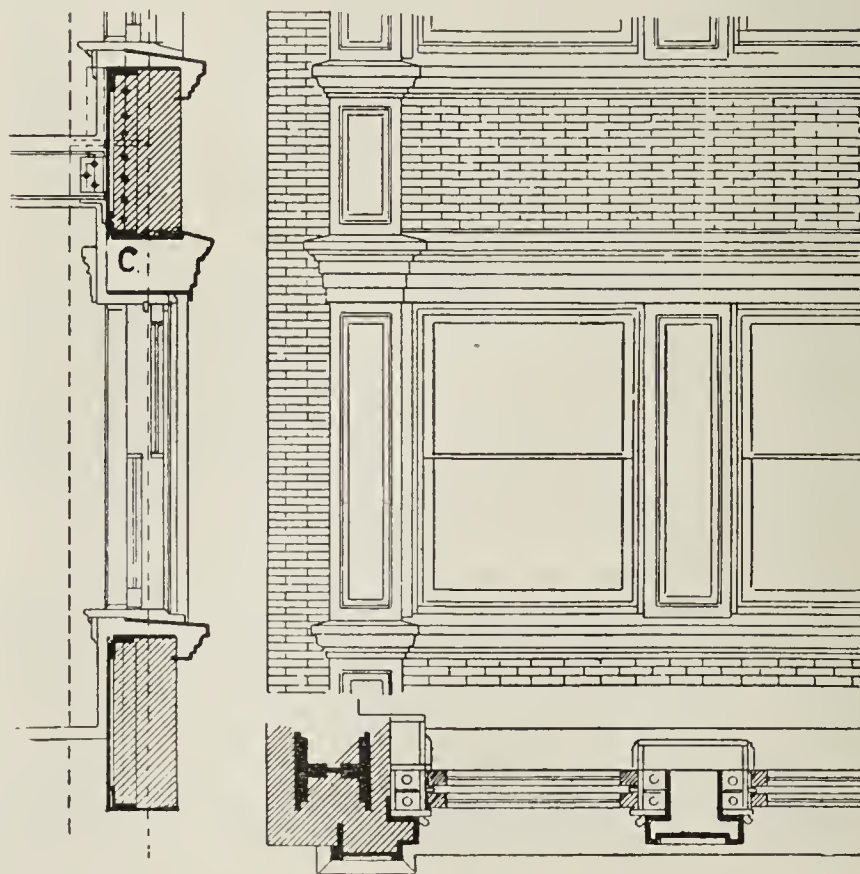
The Way it was.

FLOORS OF HOME LIFE BUILDING.

time, such elements of stability, and, on the other hand, such elements of fatal weakness.

Look to the cuts representing the floors. Beams covered with burned clay fire proofing and laid on top of them wooden sills so placed on the floor comes six inches above the fire proofing, and with no intervening filling of concrete. Here we have fire-proof construction covered in a manner that would not pass muster in a first-class frame house, and yet the clay fire proofing saved the building from total destruction, and this, despite the fact that the upper floors of this building were necessarily left as much to themselves as though there had been no fire department in the city of New York. Clay fought the battle alone and won.

An expert who examined the building the day after the fire says that the floor beams, though exposed in several places, had not been injured. On the eleventh floor there is considerable damage, but no twisting of the floor beams, although everything in the room was practically burned up so far as any further usefulness was concerned. In the northern part of the rear wing on this floor it may be said that the hall and wall partitions of terra cotta blocks were generally thrown down,



View in Court.

but it is interesting to note that one fire-proof partition succeeded in shutting off the fire most effectively from one office to another. On the inside court, above the eleventh floor, the



wrought-iron mullions and window beams above are badly twisted and out of plumb, but then it is clearly seen that these were not fire proof in the beginning. Again, this expert says: "Perhaps the most striking fact in connection with the entire disaster is the thorough manner in which the hall and room partitions were overthrown by the heat. I say heat advisedly, inasmuch as it was impossible to throw any water into the upper part of the building. On almost every floor in which the fire had gained much headway the destruction of these partitions was seen at a glance to be due very largely to the fact that the fire proofing only continued about 5 feet from the floor to the bottom of the interior sash, and this gave borrowed light to the hallways, corridors and passages."

Thus it may be seen that many hundreds of thousands of dollars could have been saved had the north shaft of the Home Life building been thoroughly protected with fire proofing, and had the openings been covered with tinned shutters. One may



Home Life Building after the Fire. Courtesy of the *Scientific American*.

say that, except for smoke and some warping from the heat, the Home Life building would to-day be practically uninjured had this precaution been taken. Had the rooms been floored with an incombustible material they would still be intact. This fire also suggests that terra cotta partitions should be stiffened by small iron uprights. The matter of economy both as to space and cost has brought these partitions to a size so small that lateral stiffening is now a necessity. The total ruin of half of the front repeats the old and expensive lesson of how utterly useless in a great fire is any building material excepting such as has already been through a great fire before, viz., terra cotta or brick. The white marble stood as well as any stone could be expected to stand, but brick or terra cotta would still be there in a much less mutilated form.

An interesting detail in connection with this fire is that the upright Z-bar columns shown on the plan had only four inches of protection of brick between them and the fire. Yet they stand uninjured. This fire is notably one in which is amply

proved the value of fire-proofing material. Here was a structure with a hot fire on the outside and a severe fire on the interior brought about by miserable frame-house construction in some of its parts; yet, because of the good that there was in it, standing up like a giant to save the lower end of New York. This building was not the tallest in New York. The Ives Syndicate building is 309 feet high, the St. Paul's building 380 feet, the American Surety building 306, the American Tract Society 306 feet, the Commercial Cable Company 304, Home Life 290 feet.

It is easy to see that a tall building can be made fire proof, and that, instead of being a menace to public safety, as in this instance, it acts as a protection to property. There is at this time a good deal of talk about limiting the height of buildings, but in a city like New York we do not see that the effort is logical or desirable where the structures are properly designed and built. This fire will lead to the shaking of the dry bones, but it is, after all, a great triumph for good building and a great exposition of that which is bad. LOUIS H. GIBSON.

#### OHIO VALLEY NEWS.

THE BRICK and sewer pipe plants have had a most successful run, with a good demand for their products, but have been greatly embarrassed by failure upon the part of the railroad companies to furnish enough cars for eastern shipments. This is a source of great annoyance to the manufacturers, as the contractors are always in a hurry this time of year to close their contracts before the weather breaks.

The old American Fire Clay Co.'s plant, at Freeman's Landing, W. Va., lately operated by T. J. Garlick, of New Cumberland, until the latter's embarrassment financially, was sold to Jas. M. Porter, for \$12,500, of the firm of McMahan, Porter & Co., of New Cumberland, W. Va. Mr. Porter will at once place the plant in repair, and operate it to its fullest capacity, manufacturing the Porter paving block.

The Ohio Valley Clay Co., of Steubenville, Ohio, have just added an immense three-story brick building to their plant, at a cost of \$17,000. They will, in the new building, make clay blocks for glass tank furnaces; still using the old building for manufacturing glass melting pots. This plant is now a model in this branch of clayworking.

Work at the McElfresh Clay Manufacturing Co.'s plant, at Penrith, W. Va., has been suspended, pending the action of the court on the receiver's report, who has been operating the plant since their financial embarrassment.

The Jefferson County Court has given permission to Dewitt C. Erskine, assignee of the Minor Fire Clay Co.'s brick works, at Empire, Ohio, to make into brick the clay mined at the time of the failure. This will keep the works running until about February 1.

The Great Western Fire Clay Co., of Toronto, Ohio, have just completed a new thirty-seven foot kiln, which they claim is the largest bee-hive kiln in the United States. Great results are expected from this kiln.

Andrew Jackson Boyce, of East Liverpool, Ohio, died suddenly, November 30, of paralysis, aged about sixty-two. He was one of the pioneer manufacturers in this valley of clayworking machinery for brick, sewer pipe and pottery work, and carried on the business successfully until his death.

Col. H. R. Thompson, director of law of the city of Steubenville, has discovered a rich find of clay on his farm, the analysis and tests demonstrating it to be equal of the Albany slip clay. Col. Thompson is making arrangements to mine and place the same upon the market.

Owing to the failure to sell the Western Sanitary Ware Co.'s property, at Hiltonville, Ohio, Wilbur L. Medill, of Steubenville, the receiver, is organizing a stock company of local capitalists to operate the pottery.

It is claimed that an organization of a trust has been formed to control the production of white, black and salt-glazed stoneware in the United States. The concerns in the combine are those of Akron, Massillon, Canton, Navarre and Zanesville, O.; Cooksville, White Cottage, Buckeye Cottage and Gas City, Indiana, and the Pittsburg Clay Mfg. Co., of New Brighton, Pa. R. P. Kent and H. C. Robinson, of Akron, Ohio, are president and treasurer, respectively, and H. M. Linn, of Zanesville, Ohio, is secretary.

It is claimed these concerns represent about 65 per cent. of the entire production of common stoneware in the United States.

CALUMET.



Written for the CLAY-WORKER.

### THE NEW YORK MARKET.



SEEMS AS IF 1898 is going to be a record breaker in respect to weather. Beyond a doubt the spring was a very wet one; the summer was slightly better, and the fall was an exceptionally good one, so far as rain. As all connected with open yard brickmaking know, without good, strong, westerly or northwesterly winds the foreman is in trouble, as the green brick will not dry.

#### —Molding Brick.—

In November is precarious business, as loss by a storm is almost sure to follow, and some of the yards molded their last pit after the 10th of that month. The majority of the yards had all the brick set in before the middle of the month.

The burning of the last kiln will, in some cases, be done in December; as men were scarce, and it required all hands to make and take care of what was made, there were none left to use around the kiln, so that on some yards there were no less than two or three, and in one case six kilns to be burned after the yard shut down. On one yard they set fire to the last kiln on the 28th of November; on another, a day or so later, that is, if it does not snow every day. At this writing, the last day of November, makes three snow storms within a week, and of a grade that the old people like to tell about. On Sunday, the 27th, full ten inches fell; last night about six inches more was thrown in for good measure.

#### —River Navigation —

Is open and shipping is going on as fast as possible. If moderately cold weather should set in, it would soon call a halt, as the amount of snow in the water would furnish just the material for a freeze of the old-fashioned kind. As long as open water exists, sending brick to market will be kept up: with the amount of snow in the streets of the city that there is, it will retard the delivery of brick at the buildings, and result in holding the boats at the docks in New York. If the cold should close all points of shipment and keep them closed till about the first of March, what stock is on hand would come in for a nice raise. If the weather should shut the upper Hudson and Hackensack and South Jersey, it is very likely that Long Island and Haverstraw Bay would be able to furnish enough for the winter demand, and hold the rates as they now prevail.

#### —Rumors of a Big Deal—

Are in the air. The syndicate that was going to buy and had asked for an option on some property has again come to life. Generally the advent of warm weather thaws out such talk, but on the eve of cold winter, the thing seems to come to life this time, and it may reach another point on the journey toward a complete structure, and the only way to make the brick trade a financial success.

#### —The Market—

Has taken all the stock as fast as it arrived, with the better grades having the call, as the off or mixed cargoes are of such a class that the buyer was rather favored in the sale. From \$5.25 to \$6.25 is the going rate, the lower quotation is for inferior lots, and the higher for the best, with the range from \$5.75 to \$6.25. It would seem with those prices the heavy snow fall is uncalled for, as the manufacturers will not be called to eat snow balls this winter. Front brick keep in the same groove. Croton Piont, brown, dark and red, \$12.00 per M; Wilmington, \$19.00 and \$20.00; Baltimore, \$37.00 and \$42.00; Philadelphia, alongside pier, \$20.00 and \$22.00; Trenton, alongside pier, \$18.00 and \$20.00.

A. N. OLDIMAN.

Hackensack, Nov. 30, 1898.



### OFFICIAL ANNOUNCEMENT.

**The Thirteenth National Conventional of Brickmakers to be Held at Columbus, Ohio, February 7 to 10, 1899.**

**A**FTER CAREFULLY considering the advantages offered by the cities of Omaha, Philadelphia and Columbus, where we have been invited to hold our next annual convention, we have decided to accept the invitation tendered at Pittsburg by Prof. Edward Orton, Jr., on behalf of the Columbus Board of Trade and the Ohio State University. The Convention will be held at Columbus, Tuesday to Friday, February 7th to 10th, 1899.

We were influenced in favor of Columbus from the first by the enthusiastic applause with which the Convention greeted Prof. Orton's announcement that Columbus wanted the Convention, and he hoped the invitation would be accepted, that the members of the N. B. M. A. might have an opportunity to visit the School of Ceramics which they had so generously supported. The plaudits which followed and the subsequent expressions from individual members evince an earnest desire on the part of a majority of our members to accept this invitation. In addition to this, the central location of Columbus, and its unrivaled railroad facilities and excellent hotels make it an exceptionally desirable place of meeting.

#### —Convention and Exhibition Hall.—

The Great Southern hotel will be headquarters during the Convention. This is a new fire-proof hotel luxuriously furnished and equipped with every modern convenience for the comfort and safety of guests. A special rate of \$2.50 per day will be made to delegates and those accompanying them for ordinary accommodations. Where rooms with bath or other special accommodations are desired the rate will be \$3.00 to \$3.50 per day, according to location. Those who will be accompanied by ladies are requested to notify the hotel as to date of arrival, etc., so that suitable reserves can be made.

Ample facilities for the exhibition of specimen brick, terracotta, models of clayworking machinery, kilns, dryers, etc., will be afforded free of charge to all members of the National Association. The Convention Hall is on the same floor and adjoins the exhibition room—all in all we believe the facilities are the best that have ever been afforded. Those desiring space are requested to notify the Secretary. Exhibits should be shipped in shipper's name, care Great Southern Hotel.

#### —Hotel Headquarters.—

As our members may readily gather at Ohio's capitol from all quarters, East, West, North or South, with equal facility, we feel assured that a large and successful Convention will result. The usual arrangements for reduced railroad rates will be made and announced with other details in due time.

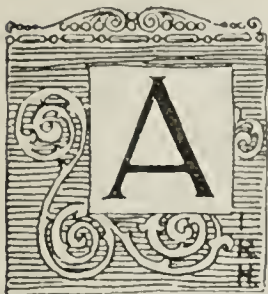
THE EXECUTIVE COMMITTEE,

Theo. A. Randall, Secretary.

Wm. Flinn, President.



CHRISTMAS GREETINGS FROM PHILADELPHIA.



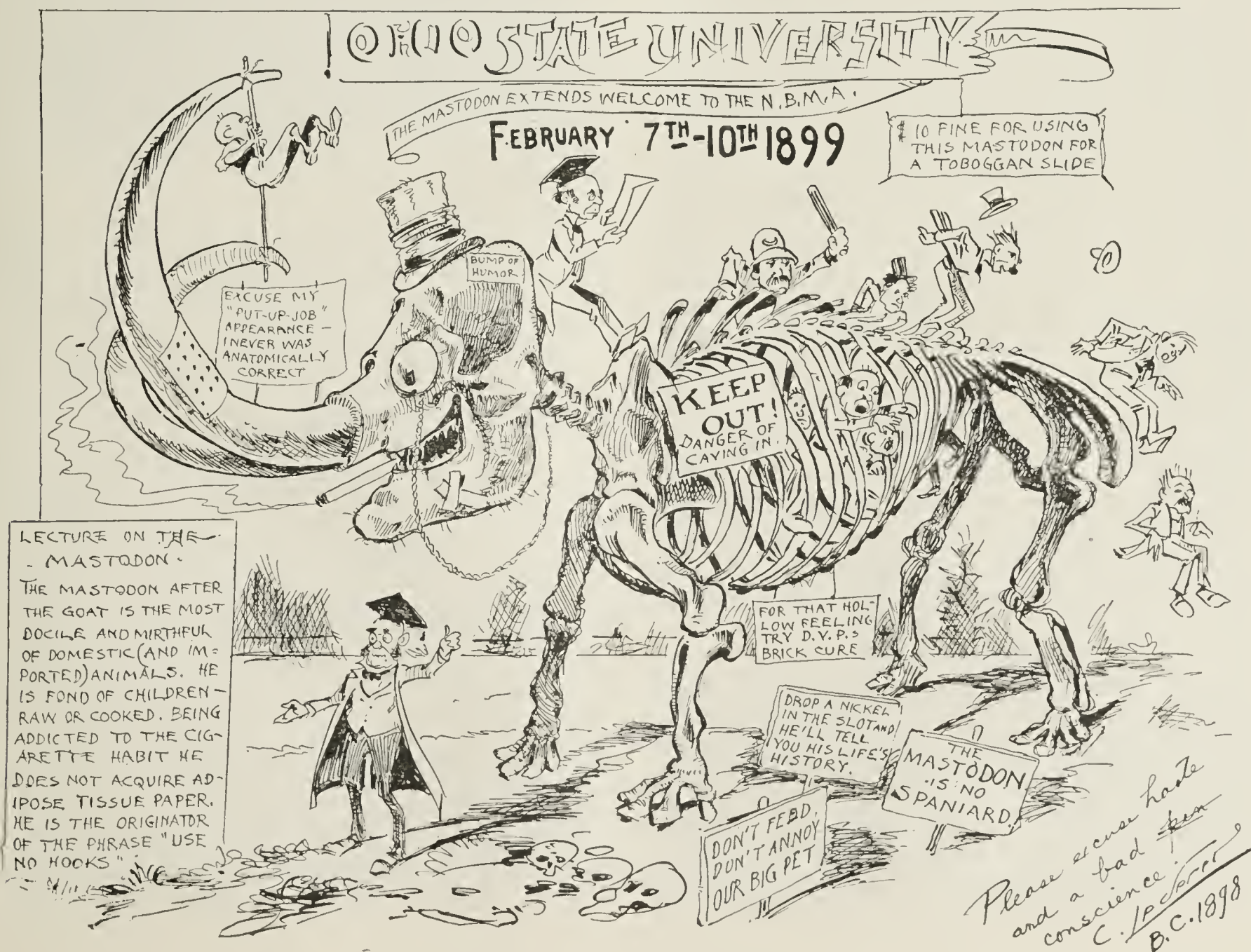
—Chambers Bros. Company.—

and the outlook for the next year, Mr. Chambers said: "Business has been fairly good. Of course, we could have done more, and would like to have done more, but as we have been shipping South and to the West, and even so far as the Celestial land, where pig tails are more numerous than brick, we can but feel that in the extended trade lines we have some cause for satisfaction. The men in the shops are still at it, and as you see them now, so it has been for some time past, and next year, I think, promises to bring along an impetus and an even balance to things generally." With an exchange of cordial good feeling, and a wish for a prosperous new year for all brickmakers, I made my way out and over the fields of slush and snow to

—H. C. Carroll & Sons.—

Eugene Carroll—

"How's business?" "Well, I can't complain, and between sending my loads out and watching the boys work round the yard, you won't have much trouble in finding me here any day





you like. Come all through the winter and you're always welcome."

—The Handsome Five-Story Building of the Main Belting Company,—

located at 1219 Carpenter street, proved to be my next stopping place, and here I found every evidence of business being up to the top notch. Outside the office, and covering the floor space of about fifty to 200 feet, were to be seen the products of this well-known firm, but one to attract my attention was a leather conveyor, and a masterpiece, measuring over 600 feet and eighteen inches wide. My inquiry brought forth the cheerful response, "Business is very good, we are making our shipments right along, and have no cause for complaint, and prospects for the new year are very gratifying."

—A Nice Compliment.—

"Yes, we get the Clay-Worker regularly, and think it one of the best trade papers in the land. So the next convention will be held in Columbus? Well, I think you may count on one of our representatives being there. Yes, the boys always have a good time. Come in and see us again, always happy to see you. Meanwhile greet the clayworkers with the compliments of the season for us. Good bye."

—George Carnell, Germantown Avenue.—

Father and son were found hurried, if anything, by stress of business. "Oh, we can't complain, we are holding our own," and in the smoke of the forgings and temperings and the reverberating tap of the hammers, I realized it. South Africa was the latest to make a call upon them, and the force was working right pert to get same ready for shipment. Congenial George Carnell even expressed his regret that he could not give more time to talk; "but if you'll come in some time soon, I'll give you a half day," and that is the kind of welcome to get.

—William Conway, 58th and Walnut Streets,—

Sends greetings to all clayworkers. He is always congenial. "Business has been fairly good, but would like to see it better next year. And now to answer the questions put to me, how do I find things and what are the prospects. In the first place, I want to say, business conditions are fairly good; that we have suffered a slackening condition during the past year is but natural. Our little late unpleasantness and the uncertainty of its duration, but not result, did much to cause financial institutions and speculators to await that result. Notwithstanding, I want to tell you men of this section that Philadelphia has done very well. The records show that no less than 5,142 building operations have been carried through, exclusive of 3,201 alterations and additions. Dissecting this roughly, I find that 3,527 two-story houses have been erected at a cost of \$7,106,000, 1,334 three-story houses at a cost of \$5,034,400, nineteen four-story houses at a cost of \$181,000, and miscellaneous buildings, comprising churches, school houses, office buildings, warehouses and others, at a cost of nearly \$22,092,400." Therefore, I gather from this that the Quaker City has been holding its own pretty well. True, we are about \$3,000,000 short, but the natural result is that next year, according to all ordinary averages, operations will absorb the extra three million, and the men who have a reserve stock will be able to place them. The above operations have absorbed nearly 200,000,000 brick, and the surplus of ten to fifteen million will be absorbed by the new operations left over from this year, and which need but the pick and the shovel to open the way, since the places are ready, and the banks are getting ready to advance the money. Philadelphia's average is about \$25,000,000, and she has a way of making an equilibrium, at least, such has been my experience, after closely watching it for twelve or fourteen years. There I can but say that conditions are fair and prospects good, and this time last year found many of the yards shut down, while to-day they are working and lively. Do you call this bad? Show me any other city outside of New York and Chicago doing so well.

—Perkiomen McAvoy.—

I learned at the office that the plant is in full swing, although shipments have decreased a little during the month. Frank, the sterling representative of progressive industry and worth, is out West, at Colorado Springs, with McAvoy, Sr. and his sister. Brotherly love is well developed in Frank's make-up. His sister's health suffered under the hard weather conditions of this city, and I learn she has improved since her arrival West; and so, boys, ye who wish Frank well, can't do better than raise your bumper and wish him "good luck" and "long life to your sister."

To the clayworkers between here and Baltimore I extend my

thanks, on behalf of Mr. Randall, for your ever-ready welcome to his representative, and wish you all a Happy Christmas and prosperity in the New Year. W. P. LOCKINGTON.  
Philadelphia, December 10, 1898.

## THE ILLINOIS CONVENTION CITY.

A Good Place for Clayworkers to Assemble January 17, 18, 19.



PEORIA, ILLINOIS, in which city the next annual meeting of the Illinois Clayworkers' Association is to be held, January 17, 18, 19, is the second city in the State; it is beautifully situated on the banks of the Illinois river, which at this point broadens out and is called Peoria lake. The river is paralleled, at some distance from the

water's edge, on each bank by bluffs which add picturesqueness to the city. These bluffs are crowned and adorned with the magnificent homes of the wealthier class.

The business center is laid out in the valley, and many of the buildings which compose this portion of the city, and which aid largely in making Peoria a metropolitan center, are imposing and substantial brick edifices, conspicuous among these being the new City Hall, just completed, a handsome four-story brick building, faced with stone; the Public Library building, recently finished; the National Hotel, the Y. M. C. A. building, the Women's Clubhouse, the Grand Opera House, the Woolner block, and the Observatory building; added to these are the large number of fine churches and school buildings, two or three of which have been added the past summer, and several more in contemplation the coming season.

Prominent among the public buildings and institutions are the new Asylum for Incurable Insane, now in course of construction, in Bartonville, a suburb of Peoria; the government building, Bradley Polytechnic Institute, Spalding Institute, which latter building is partly of brick and partly of stone, and is not yet completed. The Central Union Telephone Company is now erecting a three-story building, which they expect to occupy in a short time; this building is of buff pressed brick, with stone trimmings. Operations will also soon be commenced by the Chicago, Rock Island & Pacific Railroad Company on a new union passenger depot. Several other large brick blocks are in contemplation, many of which will be completed by spring.

The principal streets in the business portions are traversed by street cars propelled by electric motive power, many of these lines diverging into the residence and suburban portions so that one may obtain a very intelligent idea of the city and its surroundings by taking a ride on the various lines, which cover in all a distance of twenty miles.

Peoria also possesses a perfect system of water supply, and the handsome pumping station of the plant of the Peoria Water Company, which is of pressed brick, in red, with stone trimmings, is easily accessible by street car.

In 1894 the pleasure driveway and park district of Peoria was created, in which is laid out a system of parks, a total acreage of 329 47 acres, divided into four parks, of which Glen Oak and Bradley Parks are the largest, more improvements to the present time, however, having been made on the former, which, in the summer season, is a source of great pleasure to the citizens. It is intended in time to connect these parks by a system of paved boulevards and driveways, some of which have already been completed.

The streets of Peoria are wide, and most of those in the principal residence and business portions paved, the total number of miles of paving to the present time being 29.61, of which 19.72 miles are of brick, which class of paving has been used in the city for the past thirteen years. There are seven miles of asphalt, and a few blocks of cedar block and stone. The streets in the residence districts are bordered on each side by wide lawns, which, in the summer season, are kept green and add much to the appearance of the streets.

Peoria is not only an attractive city as far as natural advantages and surroundings are concerned, but is a thriving and busy business and manufacturing center as well, being centrally located and having ample advantages in the way of coal



and railroad facilities, coal being found at her very doors, and the railroads entering the city being fourteen in number, with a very good prospect of the Illinois Central, Chicago & Northwestern and the Santa Fe soon to be added to this number.

In consequence of the above advantages the manufacturing industries in Peoria are varied and numerous, chief among which are those for the manufacture of agricultural implements, bicycle factories and the immense distilling plants. It may be an item of interest to mention here that in Peoria is located the largest distillery in the world, and that this city pays more revenue to the government than any other city in the United States.

Peoria is also well located for the clay industries, the raw material being available in great abundance, as well as sand for building purposes. The above is evidenced by the fact that in this city are located three brickyards where building brick is manufactured; there is also in operation a paving brick plant, which manufactures an excellent quality of brick from shale, and a tile plant also.

Another thriving industry is the plant of the Peoria Pottery Co., which manufactures table and toilet whiteware, both in the plain and decorated. This plant is and has been for the past ten years manufacturing this class of pottery exclusively, but previous to that time also manufactured stoneware. It is interesting to visit the works and storerooms of this plant and watch the operation of manufacture, which, during the busy season, gives employment to several hundred people, male and female.

On the whole a more happy selection than that of the city of Peoria could not well have been made for the meeting of the Illinois Clayworkers' Association, for Peoria, while always a



The National Hotel, Peoria. Headquarters for State Convention.

thriving and busy city, is at the present time more active in the lines in which the visiting delegates are interested than for many years previous, and their visit will be rendered both pleasant and profitable in many ways.

Mayor Warner, in whom the visitors will find an exceptionally cordial and generous host, will extend the glad hand to the visitors and tender them the freedom of the city.

#### PROGRAM ILLINOIS CLAYWORKERS' ASSOCIATION, PEORIA, ILL., Jan., 17 and 18, 1899.

Tuesday forenoon will be devoted to enrolling members, and reports, appointing committees, etc.

##### —Afternoon Session.—

Address of welcome by Hon. George Warner, mayor of Peoria.

Annual address by President H. F. Townsend, Avon.

"How to Tide Over Dull Times and Keep Your Men," Mr. Elder, Bloomington.

Discussion.

"Drain Tile for High or Rolling Land," J. G. Walters, Chatsworth.

Discussion.

"Clayworking a Century Since and Now," H. M. Baldrige, Illiopolis.

Discussion.

"Street Paving," A. D. Thompson, City Engineer, Peoria.

Discussion.

General discussion on "Clay Washing," led by F. Lehman, Chicago.

Adjournment.

Annual banquet given by Peoria clayworkers.

The forenoon of Wednesday, January 18, will be given to visiting the various places of interest, including the largest pottery in the West, convention being in charge of the committee of arrangements.

##### —Afternoon Session.—

"The Future of Clay Products," G. A. Tompkins, Avon. Discussion.

"The Dryer," D. V. Purington, Chicago. Discussion.

"Making Paving Brick—Not Cheap, but Good," F. Plumb, Streator.

Discussion.

"Hollow Block Building vs. Frame," M. W. Lauer, Chicago.

"The Pottery," Geo. L. Wolfe, Peoria.

"Tiling Swamp Land," L. C. Streeter, Grant Park.

A poem, D. O. Loy, Atkinson.

Question box.

Report of treasurer.

Report of committee on resolutions.

Election of officers.

Headquarters will be at the National Hotel.

H. F. TOWNSEND, President.

G. C. STOLL, Wheaton, Ill., Secretary.

#### SOME GOOD THINGS.

In Store For Those Who Attend the Illinois Convention.

Editor Clay-Worker:

Peoria, Ill., January 17-18, 1899. Do you know what that means? For fear you or some of your readers do not, allow me to explain.

Those are the two days of the whole year into which are crowded the gist of the year's experiences and results for clayworkers of Illinois and adjoining States. They are two big, bright, long days—the two days of the Illinois Clayworkers' Association.

The program is a rich one, and details are almost completed. The officers are exerting their utmost efforts to make this the greatest meeting of the Association ever held. There are a number of reasons why this should be the case. For instance, the year's work has been quite satisfactory as a general thing, and should act as a stimulus; also, as the Association grows older more clayworkers are learning the benefits of such meeting; and last but not least, are the many attractions and inducements offered by the city of Peoria—Peoria (the city of distilleries), but that will not hurt us—the city of push and enterprise. The city known all over the State as the biggest-hearted, freest-handed, liveliest city in existence; where the wants of man, woman and child are catered to unstintedly; where the common every-day man is protected and made to feel at home, and the most fastidious are feasted and made welcome.

For the young man are games, attractions and pretty girls galore; for the middle-aged and business man are examples and experiences that will be beneficial; and for the aged is peace and rest. "If you don't see what you want, ask for it"—that is Peoria.

What else can you ask? The assurance on every hand of a good meeting, and a reception second to none. You cannot afford to miss it, for you will not only enjoy it while there, but it will be remembered as one of the bright spots in your life. Come and bring your friends and some thoughts for other members to discuss. Yours,

H. F. TOWNSEND,  
President Illinois Clayworkers' Assn.

#### IMPORTANT IMPROVEMENT IN BRICK MACHINERY.

The Battenfeld-Morgan Co., of Cleveland, O., illustrate on page 426 of this journal, their New Improved Combination Brick Machine. They claim it will completely revolutionize the stiff-mud process of making brick. As will be noticed it combines pug mill, machine, and repress, all to be driven by one pulley. The clay as it comes from the bank is dumped into the pug mill, where it is well pugged and worked into the clay cylinder of the machine, then passed into the mold wheel, which revolves, filling each mold with an equal amount of clay, after which all surplus clay is passed out of the mold. This operation makes the brick dense and even. After this the repress process takes place, then the brick is pushed out of the mold and driven on to an off-bearing table, a perfect and complete brick, with smooth edges and sides.





THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

### BRICKMAKING UNDER DIFFICULTIES.

President Flinn Recovers From a Bad Accident—Pittsburg Brickmakers Have a Hard Nut to Crack, But Expect to Get McGraw to Columbus.

Friend Randall:

This is a dreary winter afternoon and very cold; one of those cloudy days that our city is noted for. The ground is frozen very hard and brickmaking is very difficult, but by the aid of that chemical compound which Dewey used to such good advantage in bringing the Spanish fleet at Manila bay into subjection, we bring the giant Jack Frost to his knees, and do, therefore, claim a victory in brickmaking over all our past records by increasing our capacity to 150,000 per day. I think that this is doing excellently well for this kind of winter weather.

As to our worthy President's (Senator Flinn) injuries, he was seriously hurt, his right arm broken in two places, his shoulder blade splintered and pulled out of place, but thanks to the Lord, and a fine constitution, he is again able to be out with his arm in a sling, attending to business.

The business outlook for the coming year is very good. We have orders enough to keep us running steadily until May next. There is no trouble getting orders—if you can sell brick cheap enough, and this we do. It is strange what a person can do if he has to; think of it, making more brick this kind of weather than we did during the summer months. The weather during the last four or five days has been close to zero. Mr. McGraw is still getting lustier, and that is about the only thing the brickmakers here have had for discussion. The best method of getting him to the convention has worried us not a little. I tell you this has been a serious question with us, but fortunately Mr. Dibert and Mr. Wittmer were near the railroad, and saw some of those new steel cars built by the Shoen Pressed Steel Company, of Pittsburg, which was a joyful discovery to them. They both, with one accord, said that the genius of these men had delivered them from their trouble. We now feel assured that we can move him to Columbus and have him with us at the convention. You say you were side-tracked at Columbus. I suppose you laid over long enough to get acquainted with some of the railroad officials, and if so, you can do the Pittsburg brickmakers quite a favor by arranging with them to have the bridges strengthened, so that the four-year-old will not meet with any accident, as we have given a guarantee to his wife for his safe return. We expect to have quite a delegation at the convention, and we hope to have a pleasant time, and to profit from the experience of others, as others may profit by ours.

A. SMOKER.

Pittsburg, Dec. 10, 1898.

### An Invitation to the National Convention.

—From One Who Has Found the Annual Pilgrimages Both Pleasant and Profitable.—

My Dear Mr. Randall:

Many moons have waxed and waned since your readers have suffered the infliction of reading anything from my pen. There have been two reasons for this, and strange to say, they are somewhat contradictory. One is that the effusions of our friend Gates would seem to be all that your readers can stand from Chicago, and the other is that there has seemed to me to be a decided improvement generally in the Clay-Worker since I quit writing for it. As the weeks roll on, and the date of our annual gathering grows nearer, I feel like writing a personal letter to each member urging him to attend the convention. I know some of the difficulties that make it hard for all of us to

go. Dull business and small profits make us hesitate to spend money, but after all, there is much besides money that contributes to our happiness. There are few trade associations with the record for sociability that ours has. I know of none whose members get nearer to each other, and none of the age of ours whose yearly meetings have been so uniformly harmonious. The only one that I remember of when there seemed to be danger of discord, was at Louisville, and the conservatism of the older members, joined with the leaven of common sense of those who had just joined, so happily mixed that the threatening clouds disappeared. I write this simply as a sort of jubilee notice that, Deo volente, I shall be with you at Columbus and that my better half has promised to accompany me. Each year the roll call shows "absent" written opposite some of our members' names. Some are temporarily absent, but alas, the list of those who can never again meet with us on earth, grows larger and larger.

What we want this year is a continuation of the conditions of the last two or three years, i. e., a large addition to our membership of the younger members of our fraternity. I want to see and know those who are fast taking our places. If there is any advice I could with propriety give to this class, it is that I have given to my office force for many years, as necessary to success, viz.: Make all the friends you can, and keep all you make." From a narrow standpoint it might be urged that for business success these friends should be located near you—those with whom you had business dealings; but I could give many instances when I could trace results advantageous to my business through the friends made at these Conventions. Let me say to those who know our national conventions only through the reports, that they have but the skim milk. The cream is carefully taken off before a word is written, and is enjoyed thoroughly by those whose names you read as having been present in person.

The convention city for our next meeting is certainly geographically; is in a locality celebrated for the number and variety of its clay deposits and for the skill and efficiency of its clayworkers. I venture to say that there is scarcely any branch of our industry that is not successfully operated within forty miles of Columbus. This will naturally bring to our meetings many new men, and among these men I predict will be found many new ideas and new elaborations of old ones. At all events we cannot afford to go among these men with depleted ranks or show any falling off in interest. Neither can we afford to appear before Prof. Orton's young men as indifferent to the work we have claimed so much for.

I am not authorized to extend invitations to attend the convention at Columbus, but I know the Executive Committee of the Association well enough to be certain that they will heartily and cordially indorse my feeble efforts to obtain a representative body of men and women engaged in clayworking as an avocation. Sincerely yours,

Chicago, Dec. 12, 1898.

D. V. PURINGTON.

### Brick Business Improving in Oregon.

Editor Clay-Worker:

The November Clay-Worker is at hand, and, as usual, full of interesting matter. No wonder it is a favorite with brickmakers everywhere, for the "mud lark" who cannot find interesting and instructive matter in your every issue must be either very dull or very hard to please, or both.

The brick business in our city and vicinity has for the last four years been very poor; no demand, no price. This fall, however, there is a marked improvement. Business looked very blue in our line until about September 1 last, the brickmakers becoming discouraged and shutting down early; as a result the stock on hand is very low, total on hand at this time not being over 1,000,000 brick. To give you an idea of how the brick business has gone down, previous to the year '94 this city and suburbs consumed from sixteen to twenty million brick a year, price being \$8 per thousand. Since '94 there has been from three to three and a half million used each year, price being from \$4 to \$6. So you can see that the business dropped all at once. As I said before, there is at present an improvement, and we have worked the price up from \$5.50 to \$7 per thousand. We look for business to be very good in the spring. There are in business at present in the city the South Portland Clay Manufacturing Company, making brick with the Acme semi-dry process machine; also, F. Verstegg, with the Quaker machine; L. E. Kern, Quaker; James Anderson, Quaker; E. Verstegg, hand molding, and H. Granthaw, hand-molding. The pottery and tile works are the Western Clay Manufacturing Company and the Pacific Pottery Company.

I have a Quaker brick machine, having bought it last sum-



mer, which I propose to rig up for next year. There have been many different kinds of brick machines tried out here, but the Quaker machine seems best adapted to the clay. We have also in our city a great many blocks of brick streets, and they are giving very good satisfaction. The pavers are made by the Jensen Paving Brick Company. Their plant is near Vancouver, Wash., with an office in this city. A. NORWESTER.

Portland, Ore., Nov. 30, 1898.

### Ho for Columbus!

—Importance of Attending the National Meet.—

Friend Randall:

Your esteemed favor to hand. I am perfectly satisfied with the selection of Columbus as our next meeting place for one especial reason, and that is, that it will give us all the opportunity of personally inspecting that which we have all more or less helped to establish, "The Ohio School of Ceramics." I remember when, at the Chicago convention, Prof. Orton made his first public appeal, giving the reasons for the necessity of such a school, and a general outline of his plans. I can also call to mind some of the comments elicited; some very favorable; some not so favorable; and some antagonistic, it being held by a few that it could secure no good purpose. It certainly was an innovation, and on that account was met with the usual suspicion. The parable of the sower exemplified. Some of the seed fell by the wayside; some among thorns; some on stony places; but some fell on good grounds, and even now is bearing—in fact, has already borne—good fruit, to the good of the entire brickmaking fraternity. I have no desire to flatter Prof. Orton, but, without a doubt, his remarks at our conventions, whether in address, demonstration, or replying to personal interrogations, have easily been the features of the meeting, and those of his pupil both instructive and interesting. We all have an interest in the school (some a little deeper than others, perhaps, on account of State pride, or because, living in close proximity, we are enabled to see more of the real work of the institution, therefore appreciate it more) and ought to welcome this opportunity of "killing two birds with one stone;" we have "bought a piece of ground and must needs go to see it." Another reason why I am satisfied is because I have personal acquaintance with most of the brick-makers around Columbus—some of whom, I am sorry to say, do not attend our conventions; and outside of this irregularity are good people and safe custodians of our comfort. It may be they will all get converted this trip. Will I be there? Well, I guess yes!

That the parent institution is in a healthy and flourishing condition is fully established by the numerous and prosperous branches thrown out in the form of State associations. The doctrine of association appeals to so many with such peculiar force that it grows in popularity each year, and with each recurring convention comes a closer relation between the producers of varied clay products in every part of the United States, and sister countries. They see each other, and by interchange of ideas, grow to understand and appreciate each other. The talks in Convention and hotel, and the exchange of experiences are as pleasurable to the one as to the other; and the benefit derived is mutual. There is no doubt but that our Conventions have inaugurated an era of good fellowship, wiping out prejudices and showing up the beauty and possibility of "loving our neighbors as ourselves." Hoping this next Convention will be a record breaker in attendance,

Fraternally, I. W. CARSON.

Laprairie, P. Q., Dec. 4, 1898.

### Does the Size of Particles Constituting Fire Brick Influence Their Refractory Properties.

—With Reference to a Paper Read at Buffalo Before the Meeting of the American Institute of Mining Engineers.—

Editor Clay-Worker:

Experience derived from test furnace and from actual practice in many various furnaces proves conclusively that the size of the particles which make up a fire brick has a very important bearing as to its lasting qualities when in use, and is a subject deserving the attention and investigation by all practical fire brick manufacturers. The paper read before the Mining Institute on this subject is too technical to be fully appreciated by the average fire-brick man, like myself, who,

though not scientific, has given much thought and observation to this subject, both by test furnace and the wear or life of fire brick in metallurgical furnaces.

While I am not prepared to either confirm or criticise the data given in the paper named, will say to fully discuss this subject there are other conditions besides the action of heat and gases to be considered before deciding what size the grain of fire brick will do the greatest amount of duty. Many fire brick suffer more from heating and cooling or expansion and contraction than they do from heat and gases. Again there are many furnaces where the punishment is from heat and abrasion and in other from heat and sharp blast. With these varied conditions the first general principle I would lay down is no matter how refractory the fire clay may be that one general system of manufacture as regards uniformity of the size of the particles, porosity or density, will make fire brick suitable for all purposes, is a great error.

In making up an order for fire brick the first thing to be considered is, what is the kind of furnace it is required for and to what action will the brick be subjected, then decide upon the formula or mix that will best meet these conditions. In a furnace working at a high temperature and subject to repeated sudden cooling, a friable, porous, coarse-grained brick will best expand and contract without crumbling or cracking. Where furnaces have a continuous heat the particles should be finer and more dense, and in furnaces where brick are subject to heat and abrasion, still finer and more compact.

The bulk of the highest grade fire brick is manufactured from flint fire clays, which non-plastic, this is cemented together with plastic fire clay. The flint fire clay particles being much more refractory than the plastic bond. I hold that in high temperature furnaces, the wear of these two clays that constitute the brick do not wear away uniformly, that the bond clay holding the particle of flint clay together being more fusible, melts first, thus taking away the bond, the flint particles floating away with it without being thoroughly fused. Again, if these particles of flint clay are very coarse they require a larger amount of bond clay to cement them together and subject them to the action named. Should the flint clay be ground very fine it would require less bond clay, but would present another condition, that is, heat would surround and fuse a fine particle of flint clay more readily than it would a larger one. For this reason, after having secured by means of screens flint-clay particles of required size, they should not be passed through a wet pan and a portion of same reduced to a very fine state, but be prepared in a pug mill, thus retaining the size of the particles and uniformity of the grain. I will leave to the professional chemist to take up the subject of the constituents of fire clay with corresponding action of gases upon same, as I am satisfied it is a question they are better able to discuss than myself. All fire clays contain a proportion of deleterients in the form of Alkali, oxides, etc., and that the action of the gases on same is in accordance with their different combinations. For these conditions the less the free silica as compared with the combined silica, and that the higher the percentage of these deleterients there should be a higher percentage of alumina.

I hope other parties interested in fire brick manufacture will contribute their views on the subject of the paper in your next issue. It is by these varied observations and judgments of practical men, together with those of the chemists, that we are able to arrive at an intelligent knowledge as to what is best and so keep in line with the times. W. GARLAND TAYLOR.

### A Great Record—Who Can Equal It.

Publisher Clay-Worker:

The November number of the Clay-Worker received, and I find it full of information and good reading, as usual.

The product of my one-machine plant, from April 9, 1898, to Oct. 29, 1898, inclusive, is 7,313,591 brick.

Can this record be beat do you think?

My superintendent, Mr. F. I. Shares, who is responsible for this record, believes that it goes ahead of anything in this section. I might also add that we have a New Haven machine, made by the Eastern Machinery Co., one of your advertisers.

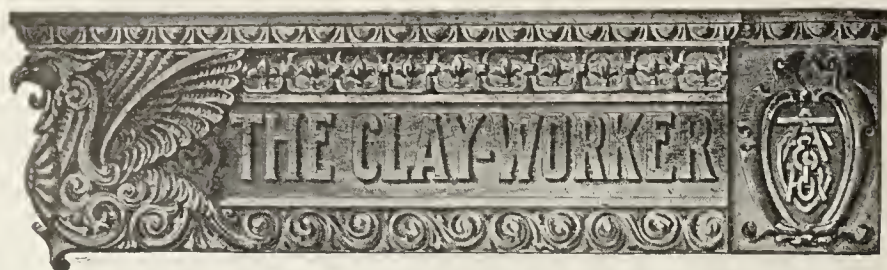
Berlin, Conn., Nov. 22, 1898.

W. L. DAVIS

### PATER FAMILIAS.

Some call old Santa Claus a myth  
And think his power has waned here,  
But, as for me, I can assert  
Each year I find his reign dear.





Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

#### FIFTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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#### ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to  
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXX.

DECEMBER, 1898.

No 6.

#### CURRENT COMMENT.

Christmas Time  
Is subscription time,  
The happiest of all the year.  
Don't forget it reader dear.

\* \* \*

With every channel of trade and commerce running full to the brim, who can fail to see that inevitably there must be a revival in all building lines the coming season.

\* \* \*

Knowing that an increased demand for clay products will prevail the coming season, isn't it the part of wisdom to arrange to meet it by putting factory and yard in thorough repair, adding such up-to-date appliances as will insure the largest output with the least expenditure.

\* \* \*

After he has done this, the wise clayworker will cultivate his market, doing what he may to insure a larger return for his labor and investment. To this end, consult with your neighbor—your competitor—see if you cannot agree upon a minimum price that will make the coming season more profitable than the past. There is a common interest between you that should make this easy.

\* \* \*

The past season has been fairly active, the demand for clay products has been large, but prices have ruled so low that manufacturers, now that the work is done, have little to show for it. They have been "swapping knives," so to speak. If they continue the swapping process they will be little benefited by an increase in the volume of trade, be it ever so great, for the margin of profit has been so infinitesimal as to be hardly worth considering. A return to better prices is fully as important as an increased demand, if not more so. It rests with the manufacturers themselves to make the coming year one of profit as well as of plenty.

#### BRICK PAVEMENTS.

We think we are getting down to the meat of the brick paving question. Mr. Taylor's article in this month's number is replete with splendid, practical facts, and if we be able to drill his ideas into the heads of engineers, contractors and brickmakers as well we shall be able to make business for our friends and patrons, and as that is a large part of our business, we intend to shoot at the mark until we make an impression. We have the ammunition and we have the gun, and we have recently had some object lessons in gunning. We shall pierce the armor.

#### OUR HOLIDAY GREETINGS.

The relationship which exists between such a journal as the Clay-Worker and its readers is too sacred to allow such a season of festivities as our Christmas and New Year's holidays to pass without the exchange of greetings. The task of preparing matter from month to month would be almost unbearable if the cold business element, which necessarily enters into it, were all or even the chief consideration involved. There comes to an editor a sense of kinship with his readers not unlike that which a conscientious teacher feels in his pupils and the feeling that he is working for their good even more than for the money he expects or has received, and he soon comes to feel that he enters into their domestic and social joys and sorrows as into no others outside his own domestic circle, and this sentiment is often of not always reciprocated. Because of this relationship, and not through mere form, the Clay-Worker bears the greetings of the editor and whole staff of employes and workmen to its many readers, wishing them a Merry Christmas and a Happy New Year. In the midst of your festivities remember the editor and his staff are with you in spirit, though not in person.

#### CHRISTMAS THOUGHTS FOR BRICKMAKERS.

A friend of this journal, one known to every member of the N. B. M. A., came into this office a few days ago and said: "I have an Xmas present concealed on my person for every reader of the Clay-Worker." He is rather a large man, and we didn't question his sincerity. "I have an idea," he said, "an Xmas idea, one born of experience. One born out of a lean year, which should have been fat. I have been bidding against my competitors, and my competitors have been bidding against me, and, while there is plenty of business for all of us, we have succeeded in doing a large business and getting a relatively small profit out of it. Now, why can't a man take something into his head on Xmas that will enable him to put something more substantial into the stocking at the end of next year? Do we sell brick at low prices because we have to? I say no. We sell them cheap because we are a lot of chumps. If every man of us had felt a year ago as I feel now, I might just as well have had a dollar more on a thousand for my brick. Now I want every brickmaker to put this idea in his pipe and smoke it on Christmas, and on the first of the year; for them in each community to get together and figure up how much better off they would have been if they had reached an understanding a year before. Let the result do the rest. Of course, an organization of this kind should have a business form, and the stronger it is the better. It's possible to arrange such affairs in good business shape. Other industries vastly more complicated than brickmaking have succeeded in organizing themselves on a practical and profitable basis. Why not brickmaking? One of two things is true. Either brickmakers are too wealthy, are making too much money to find a local organization a necessity, or they are lacking in that rare sense known as common sense. I wish I could hope it was the former. It is possible that as individuals we have common sense,



but I think that it is a case where we are wiser as individuals than we are as a mass. I put this out as a Christmas thought. I hope it may be a Christmas gift which will find receptive minds." We answered a fervent "so mote it be."

#### TILE FLOORS—WAINSCOTING.

It has been the habit during recent years to make use of what is known as marble mosaic (concrete and marble) for floors of office buildings and similar structures. At first such a floor promises well. Then, again, it is a new thing, and it is a quality of the American people that they would rather have almost any new thing than any old thing. When they get bitten they go back. What has been the experience with the marble mosaic floors? They have cracked, and either the cement or the marble has worn unevenly. In not a few instances the marble wore loose. This is a natural result, owing to the way in which the marble was treated in finishing the pavement. The marble is put in the composition and then ground down with heavy stones. In the nature of things this works the marble loose to some extent. In the course of time the result is conspicuous. Either the marble is softer than the cement, or the cement is softer than the marble. It has always happened in using two dissimilar materials for the same ware that there must necessarily be a dissimilarity in the materials and necessarily a dissimilarity and unevenness in the wear. There has been quite a reaction in recent months from the marble mosaics. Definitely speaking, we may say that a marble mosaic is nothing more than a diluted cement floor.

We are now coming to the use not only of ceramic mosaic floors, but also ceramic vestibules, and vestibules in public and quasi public structures. In case of fire the salvage on ceramic mosaics would be naturally greater than on marble, which is the material commonly used. Marble is soft, and tile is indestructible. Time or circumstances, heat or cold, have no influence upon it. The material from which tile is made was created out of all of the experiences which came to mother earth. It is finished in a furnace. What a history. Tile is subject to art forms at a minimum of cost which marble is not. There may be infinite varieties without additional expense, which is not possible with marble. The American people have had their experience, and they will now return to their mutton. The expense is not greater, and the value much greater. The new buildings in New York and Boston emphasize this fact.

#### 1884—FOURTEEN YEARS OF SUCCESS—1898.

With this issue the Clay-Worker closes its fourteenth year. We have no desire to celebrate the event with a display of red fire or any amount of vain boasting. We leave that for others. The year's work, like those that have gone before, was well done. How well is indicated by the annual index on other pages. A glance through it will show how thoroughly we have covered the entire field of clayworking. It will show, too, the same added improvement that has come with every year. In no time in its career has the Clay-Worker played hare and gone to sleep, but has kept steadily on its way, keeping step to the time of progress, striving diligently for high ideals. Our ambition from the first has been to furnish the clayworking craft with a helpful cheery medium for better work. That we have succeeded is attested by the bound volumes that have a place in many libraries. Those who have preserved the Clay-Worker from the beginning have a storehouse of knowledge that is not equaled in any other form. Piled one upon another, the volumes of the Clay-Worker are as so many stepping stones, each leading to a higher level of trade knowledge. Compared to it, our contemporaries are as the child's primer to the unabridged dictionary.

We turn from the old to the new year with the same con-

fidence and assurance of efficiency as of yore. Never has the outlook been more promising. Never have we been better equipped for effective work. Never stronger in resources and faith in the industry for which we labor. With a corps of as able writers as is known in any industrial field, we can promise our readers the same improvement in the quality and character of service the coming year that has led so many of our readers to say, "The Clay-Worker gets better every issue." To deserve this high praise is no mean ambition. That we have done so is due in a large measure to the constant support and co-operation of our readers themselves. No trade journal in any field can boast of more friends, true, helpful friends, than it has been our good fortune to win. With their continued support the Clay-Worker for 1899 will be able to maintain its record and continue to "improve with every issue."

The new year promises to be most prosperous. All clay-working industries will surely make substantial advances. With the promise to lend our best efforts to that end we cheerily bid our readers a very prosperous and happy New Year.

#### THE NEW YORK FIRE.

We call attention to a special article in this number on the recent New York fire. This fire proves clearly enough what fire-proofing will do. From reliable sources of information it appears that the fire-proofing saved the lower end of New York City. The Home Life Insurance Building was not injured where there was clay fire-proofing. It was injured where there was none. The Home Life building appears to have been a kind of sandwich—of good and bad construction. There was construction which would not do credit to a frame house, and then there was that which was up to date, and it was the latter which saved the general structure of the building and millions dollars of property south of it. The general frame work of the building is intact. The walls and the fire proofing of the floors, the steel columns, beams and girders are uninjured, and all that remains to be done is to take the building where the clayworkers left it and replace again what the carpenters did. Let us hope that some of the exposed metal work and the interior kindling wood construction will receive more intelligent consideration.

#### WITH MILWAUKEE BRICKMAKERS.

It was our good fortune recently to spend an afternoon among the brickmakers of Milwaukee. That the occasion was very pleasant goes without the saying, for brickmakers are proverbially social and companionable, and the Cream City brethren are extremely so. They are now working in harmony, have a good local organization, and when they meet either casually or at their headquarters greet one another with a hearty handgrasp and kindly words of cheer. They no longer eye each other suspiciously or as mortal enemies, but are neighborly. There is a good demand for brick, sufficient to keep all yards going later than usual, and prices are satisfactory both to manufacturer and consumer. Milwaukee wants the N. B. M. A. Convention in 1900, and proposes to make her want known at Columbus by a large working delegation that will come early and stay late. In the writer's opinion Milwaukeeans are hard to beat. Their staying qualities are great.

A bright, attractive little booklet comes from the Williams Patent Crusher and Pulverizer Co., St. Louis, Mo. It is devoted to enlightening the public as to the merits of the Williams pulverized and hinged-hammer shredder, which are carefully described and illustrated in an attractive manner. These machines are adapted to a large variety of materials, including shales and clays of all kinds as clearly proven by testimonial letters from well-known clayworkers throughout the country. A copy of the book can be had for the asking.



## TABLE OF CONTENTS.

|                                                                                                                   |     |                                                  |                                |
|-------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------|--------------------------------|
| Utility and Art in Clay.....                                                                                      | 431 | Ohio Valley News.....                            | 455                            |
| Brickmaking in Cumberland, England.....                                                                           | 432 | New York Market.....                             | 456                            |
| Paving Brick in New York City.....                                                                                | 434 | Some Good Things .....                           | 459                            |
| Street Paving in Dayton, Ohio.....                                                                                | 436 | Brickmaking Under Difficul-                      | ties .....                     |
| Paving Brick Notes in Kansas City.....                                                                            | 438 | An Invitation to the National Convention .....   | 460                            |
| Brickyard Sketches.....                                                                                           | 439 | Brick Business Improving in Oregon.....          | 460                            |
| Button-Hole Talks.....                                                                                            | 441 | Ho for Columbus .....                            | 461                            |
| What Kiln Shall I Build?.....                                                                                     | 442 | Does the Size of Particles Con-                  | stituting Fire Brick Influence |
| Up On the James River.....                                                                                        | 445 | Their Refractory Properties..                    | 461                            |
| Does the Size of Particles Have Any Influence in Determining the Resistance of Fire Clays to Heat and to Fluxes.. | 445 | A Great Record — Who Can Equal It .....          | 461                            |
| Anglo-American Pottery.....                                                                                       | 448 | Pater Familias .....                             | 461                            |
| A Brick Factory in a Wooden Town .....                                                                            | 450 | Pacific Coast News .....                         | 472                            |
| Brickyard Construction .....                                                                                      | 451 | <b>EDITORIAL :</b>                               |                                |
| Ceramic Association, Ohio State University .....                                                                  | 451 | Current Comment .....                            | 462                            |
| The Clay Industries in the Eastern Countries of Europe.....                                                       | 452 | Brick Pavements.....                             | 462                            |
| Lessons of a Great Fire .....                                                                                     | 454 | Our Holiday Greetings.....                       | 462                            |
| Official Announcement.....                                                                                        | 456 | Christmas Thoughts for Brick-                    | makers .....                   |
| Christmas Greetings from Philadelphia.....                                                                        | 457 | Tile Floors .....                                | 463                            |
| The Illinois Convention City ..                                                                                   | 458 | 1884—Fourteen Years of Success —1898 .....       | 463                            |
| Program Illinois Clayworkers' Association .....                                                                   | 459 | The New York Fire .....                          | 463                            |
| Important Improvement in Brick Machinery.....                                                                     | 459 | With Milwaukee Brickmakers ..                    | 463                            |
| <b>CORRESPONDENCE :</b>                                                                                           |     | Two Papers for the Price of One                  | 465                            |
| A Fine Prospect .....                                                                                             | 442 | Editorial Notes and Clippings ..                 | 470                            |
| St. Louis Notes .....                                                                                             | 449 | <b>MISCELLANY:</b>                               |                                |
| Advantage of Brick Compared With Frame Buildings .....                                                            | 453 | Get It Off Your Mind.....                        | 434                            |
|                                                                                                                   |     | Jonah Coughed Up Again.....                      | 446                            |
|                                                                                                                   |     | Striker Out.....                                 | 446                            |
|                                                                                                                   |     | At Christmas Time.....                           | 447                            |
|                                                                                                                   |     | A Busy Concern .....                             | 464                            |
|                                                                                                                   |     | 8,000,000 Made on One Machine in One Season..... | 464                            |
|                                                                                                                   |     | Ho For Columbus .....                            | 464                            |

Index to Advertisements on Inside Cover Page.

## BOOKS FOR BRICKMAKERS.

- "CLAY GLAZES AND ENAMELS,"  
Henry R. Griffen, C. E. \$ 5.00
- "BRICKMAKER'S MANUAL,"  
Morrison and Reep, 3.00
- "BRICKMAKING AND BURNING,"  
J. W. Crary, Sr., 2.50
- "TABLE OF ANALYSES OF CLAYS,"  
Alfred Crossley, 1.00
- "VITRIFIED PAVING BRICK,"  
H. A. Wheeler, E. M., 1.00
- "PRACTICAL FARM DRAINAGE,"  
J. J. W. Billingsley, 1.00

Mailed, postage free, on receipt of price.

**T. A. RANDALL & CO.,**  
Indianapolis, Ind.

**RARE OPPORTUNITY**—Large clay bed in city limits, close to railway and steam boats, clay close to surface, fuel \$1.25 per cord, four foot wood.  
J. CHATTAWAY,  
121 s Petoskey, Mich.

**WANTED**—A practical experienced brickmaker to take half interest in an established plant in Michigan, well located and well equipped. A good opening for the right man. Must have money enough to run the business comfortably. Will be given full charge.  
Address,  
121 dm "NEWCOMER,"  
care Clay-Worker.

### COMPLETE FIRE BRICK PLANT FOR SALE OR TO LEASE.

For sale or to lease, at a sacrifice, the complete equipped plant at Kreisherville, Staten Island, N. Y., formerly operated by the Anderson Pressed Brick Company. This plant is probably the finest in the country. It is fully equipped for the manufacture of all grades of pressed bricks, fire brick, hollow brick, paving brick, etc. The buildings are of brick and stone and in the best condition and were erected in 1893. The kilns, boilers, engines, clay conveyors, steam pressing machines, etc., were constructed in the most approved manner and without regard to cost.

Unexceptionable water front facilities of more than 1,000 feet, private canal, and ample docks for the reception and shipment of goods.

One of the finest clay banks in the count is a part of this plant, and readily accessible to the works. Sufficient clay mined and dried is on hand to permit the starting of the work at once. This splendid property is offered for sale at a sacrifice, or will be leased at moderate rental.

Apply to  
122 a JOHN WEBER,  
10 East 23d St., New York City.

### TWO PAPERS FOR THE PRICE OF ONE.

The two best papers published in the English language for brick and tilemakers are the Clay-Worker and the Drainage Journal. We have made clubbing arrangements which enable us to offer both papers for 1898 for \$2 the price of one. If you want the best information obtainable in all matters pertaining to the brick and tile business, you can't afford to be without either of these representative magazines. They are the best of their class. Address all orders to T. A. Randall & Co., Indianapolis, Ind. Those of our readers who want to subscribe for the Brickbuilder, Scientific American, British Clay-Worker, Century, Harpers, Scribners, St. Nicholas, Youth's Companion, Cosmopolitan, Ladies' Home Journal, Munsey or any of the standard magazines, can save money by ordering same through us in connection with the Clay-Worker. We will make a special club rate with any magazine desired. Now is the time to subscribe.

### A BUSY CONCERN.

The Horton Manufacturing Co., Painesville, Ohio, write that they are very busy, and consider the prospects good for a splendid season. Inquiries are numerous and of a character that indicates a large demand for brick machinery. Indeed, their trade is increasing to an extent that compels them to increase their traveling force. They have recently secured the services of I. M. Justice, who for a number of years was secretary of the Ohio Brick and Tile Association. His wide acquaintance among clayworkers, his known ability as a practical brickmaker and his sterling qualities of head and heart will enable him to hold his own with the best of the old-time "missionaries."

### 8,000,000 MADE ON ONE MACHINE IN ONE SEASON.

The Wellington (Ohio) Machine Co. hand us the following copy of a letter received from one of their customers, with request to publish it, and we do so, believing an unsolicited letter of this character from a prominent firm will be of interest to many of our readers:

The Wellington Machine Co., Wellington, O.:

Gentlemen—We have just received a letter from ——. He says he is contemplating buying a "Monarch," and writes for our opinion in regard to it. We are glad to say that we are able to say nothing but good things about the machine, and what we said I can assure you will not do you any harm. We have already made over 8,000,000 on it, which we stated to him, and also invited him to our yards. We remain, yours very truly,  
THE MECHANICVILLE BRICK CO.,  
A. D. Cady, Treasurer.

Mechanicville, N. Y., Dec. 13, 1898.

### HO FOR COLUMBUS.

For the Brickmakers' National Convention, at Columbus, February 7 to 10, 1899, the favorite line from Cleveland, the Mahoning Valley, Western Reserve and Northeastern Ohio generally, will be the Cleveland, Akron & Columbus Railway Company.

The service of this line between Cleveland, Akron and Columbus is thoroughly adequate to the needs of the traveler.

The morning train leaves Cleveland Union Station at 8:50 A. M., carrying a through parlor car, and the night train leaves Cleveland Union Station at 7:40 P. M., carrying a special sleeper between Cleveland and Columbus, in which passengers are allowed to remain undisturbed until 7:00 A. M., the car being set aside at the west end of the Union Station at Columbus. Special attention is called to this feature.

There is no similar accommodation between Cleveland and Columbus, and the delegates to the Convention will undoubtedly prefer to travel at night in this manner. Full information in relation to this service, and the rates available for the Convention may be obtained upon addressing C. F. Daily, General Passenger Agent, No. 945 Society for Savings Building, Cleveland O.

The A. B. C. of brick and tile drying is graphically illustrated by the American Blower Co., of Detroit, Mich., nor do they stop at that, but will gladly go through the entire alphabet with any clayworker who seeks information relative to the most modern methods and appliances for drying brick and tile economically, as is indicated in their ad on back cover page.





of this famous machinery sold and placed in successful  
operation during that time.

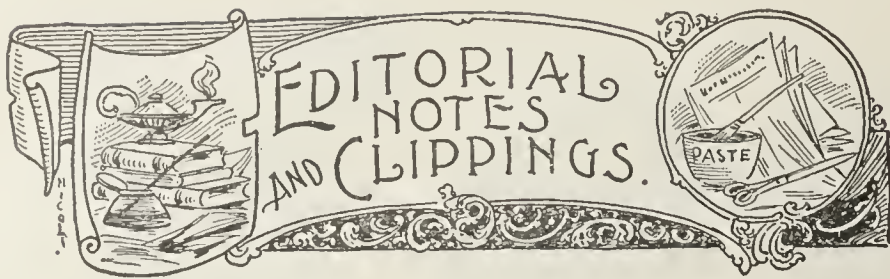
- Augusta, Ga. Outfit, 50,000 brick per day, with Automatic Cutter.
- Bolivar, Pa. Complete Plant, 50,000 brick per day, with Automatic Cutter and Re-presses.
- Toronto, Canada. Outfit, 50,000 brick per day, with Re-presses and Automatic Cutter.
- Opelousas, La. Complete Plant, 30,000 brick per day.
- Kingston, Jamaica. Complete Plant, 30,000 brick per day with Re-presses.
- Lewiston, Pa. Outfit, 30,000 brick per day.
- Cumberland, Md. Complete Plant, 40,000 brick per day, with Re-press.
- Vanport, Pa. No. 1. Outfit, 50,000 brick per day, with Re-press and Automatic Cutter.  
No. 2. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Doniphan, Mo. Outfit, 30,000 brick per day.
- Punxsutawney, Pa. Complete Plant, 40,000 brick per day, with Re-press and Automatic Cutter.
- Cassadaga, N. Y. Outfit, 30,000 per day.
- Sieglerville, S. C. Outfit, 25,000 per day.
- Thomas, Alabama. Complete Plant, 50,000 per day, with Re-press and Automatic Cutter.
- Pittsburgh, Pa. No. 1. Outfit, 50,000 per day with Re-presses and Automatic Cutter.  
No. 2. Outfit, 50,000 per day, with Re-press and Automatic Cutter.
- Edenberg, Pa. Complete Plant, 30,000 per day, with Re-press.
- Mexico City, Mexico. No. 1. Outfit, 30,000 per day.  
No. 2. Complete Plant, 50,000 per day, with Automatic Cutter.
- Abbeyville, Ga. Outfit, 25,000 per day.

COULD A BETTER  
TESTIMONIAL BE OFFERED?



C. W. RAYMOND & CO., DAYTON, OHIO.





Fultonham, Ohio, is to have a new brick plant.

Fargo, N. D., is to have a brick and tile plant.

Thomas Bean will establish a tile factory at Hartford, Ky.

According to a local paper, North Yamhill, Ore., is badly in need of a brickyard.

The citizens of Campbells, S. C., would like to see a brick manufactory started there.

G. Branch has sold his brickyard at Keene, N. Y., to Albert Call, who will operate same in the spring.

The Buena Vista (Va.) Fire Clay Co. is to be reorganized and the plant will be operated regularly again.

The Builders' Enamel and Fire Clay Co. has been incorporated at Pierre, S. D., with a capital stock of \$300,000.

Dearborn Bros. & Co., of Lynn, Mass., will manufacture brick at the old Smith yard at Newburyport, Mass., in the spring.

The property and plant of the Maryland Brick Co. at Baltimore, Md., was offered at auction recently, but withdrawn on a bid of \$33,500.

Our St. Louis correspondent writes that the prices there have stiffened somewhat, and as a consequence the brick men are feeling more cheerful.

F. E. Swift, of Washington, Iowa, has put a number of his kiln furnaces in at the Mack Manufacturing Co.'s plant at New Cumberland, W. Va.

Chas. E. McHose, of Maxwell, Iowa writes that he is in the market for a good second-hand brick and tile machine, and a bevel-gear pug mill.

The Denver (Colo.) Dry-Pressed Brick Co. is building a new plant at Highlands. They will tear down the old plant as soon as the new one is completed.

A new firm, to be known as Kuck, Tyndall & Co., has been incorporated at Decatur, Ind., to manufacture brick and tile. They have a capital stock of \$12,000.

W. N. Durbin, the genial secretary of the Anderson Foundry and Machine Works, Anderson, Ind., reports a good season for 1898, and a flattering outlook for 1899.

In a recent letter, J. Edson Clapp, of Vicksburg, Mich., writes that his trade the past season has been good, and the present prospects for next season are fine.

The Indiana Brick Co., of Alexandria, Ind., has leased the Chesterfield brick plant, and the factory will resume operations at once. It will have a capacity of 50,000 a day.

The Columbus Face Brick Co. is a new concern incorporated at Columbus, Ohio, to manufacture mottled gray and red brick. John G. Reinhard is at the head of the enterprise.

Frank Aker, a well-known brick manufacturer and contractor of Louisville, Ky., passed away last month. Mr. Aker was sixty years old, and held in high esteem by his associates.

Fire destroyed the plant of the Opelousas (La.) Brick and Tile Works, November 25, causing a loss of \$5,000. Mr. Chas. Settoon, the proprietor, states that in all probability he will rebuild.

Andrew Lonyo, a brick manufacturer of Detroit Mich., has purchased the yard of Greusel Bros., together with 17 acres of good clay ground. Mr. Lonyo expects to organize a new brick company.

A correspondent reports that the Clark Pressed Brick Co., of Malvern, Ark., are running full time and are getting good prices for their brick. They have recently put in another four-mold Boyd press.

The plant of the Des Moines (Iowa) Brick Manufacturing Co. was completely destroyed by fire November 26. The fire started in the dry room, and before the fire department could respond to the call the entire plant was in flames. Mr. T. F. Flynn, the manager, writes that the loss is estimated at \$50,000. The company carried insurance amounting to \$37,000. It

is the intention of the company to commence rebuilding at an early date. They have on hand about 300,000 paving brick, so they will probably be able to take care of orders in the meantime.

The Huntington (W. Va.) Paving, Building and Brick Co., which has been idle for two years, has been purchased by J. Holsche. The plant will at once be put in operation manufacturing clay shingles.

E. M. Freese & Co., Galion, Ohio, write that during the past year they have been adding to and improving their line of machinery and appliances, and that their trade the past season has been quite satisfactory.

E. G. Stevens, Jr., agent for the Birmingham (Ala.) Fire Brick Works, writes that this firm has just established a pottery department for making jugs, jars, flower pots, etc., which is now in successful operation.

Wm. Lamb & Co., advise us that they are in the market for a six-mold brick press and also a clay crusher, and would accordingly be pleased to receive catalogues, price lists, etc. Their address is P. O. Box 803, Victor, Col.

The Electric Brick, Terra Cotta and Tile Co. has been organized with a capital stock of \$100,000. Frank P. Demarest is president of the company, with an office at 159 West 34th St., New York City. The plant is in New Jersey.

E. F. Kocher and L. H. Parker have purchased a tract of land at Zanesville, Ohio, on which they expect to erect a clay-working establishment, where they will turn out common and pressed brick, window sills, chimney caps, etc.

A fine deposit of clay has been discovered within the city limits of Minneapolis, Minn., by Julius Gobeaux. Mr. Gobeaux has had the clay tested, with the result that a factory will at once be established for the manufacture of paving brick.

The stable of the Jamestown (N. Y.) Shale Paving Brick Co. was destroyed by fire the night of the 4th inst. Five horses perished in the flames. The origin of the fire is unknown. The loss is about \$2,000, on which there is some insurance.

The Pennsylvania Railroad Co. has put in a number of vitrified brick platforms at stations in Pennsylvania. At New Castle an old asphalt pavement was recently torn up and replaced with brick, and the company seems well pleased with their experiments.

The Ensley (Ala.) Brick Co. report a splendid trade for the past season and bright prospects for the coming year. They have recently put in a new conveyor and are building a number of permanent kilns. They are also building a number of houses adjoining the works.

Great damage was caused at the works of the New England Steam Brick Co., at Barrington, R. I., by the storm which raged along the coast early the present month. The dryer and the blacksmith shop were completely demolished. The company estimates the loss at about \$10,000.

Jno. T. Pennington, bookkeeper of the Springfield (Ill.) Paving Brick Co., while on his way to the plant with some \$800 with which to pay off the employes, was held up by a masked negro and robbed of \$200. This was in silver in a bag which Mr. Pennington had. The balance of the money was in bills, which the highwayman did not get.

The Humboldt (Kan.) Union says: "The Humboldt Brick Manufacturing Co. have recently added a fifteen-horse-power crusher to the plant, and there will be no wastage of shale hereafter, but everything will be crushed fine as powder before being made into brick. It is a valuable acquisition. The crusher was furnished by the American Clay-Working Machinery Co., Bucyrus, Ohio.

We called on the Wellington Machine Co., a short time ago, and found them running their works to their fullest capacity. They report that the last season was by far the largest that they have had since 1893, and that their confidence in the coming season is shown in the fact that they are building a stock of sixty of their "Monarch" and "Iron Quaker" brick machines, and also a large stock of mold-sanders and supplies, so as to be fully prepared for the good trade that is certainly coming in the spring of 1899.

While making an excavation for a road on the land of B. F. Fleming, Cambridge, Ohio, a fine deposit of shale was discovered. The clay has been tested, and found suitable for paving brick. As Mr. Fleming is well along in years, he does not care to take up the work of developing this shale.

CONTINUED ON PAGE 472.



# The "Monarch" BRICK... MACHINE,

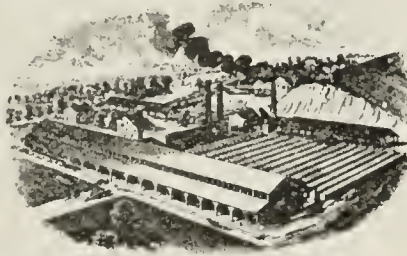
Unquestionably the —  
Leading Horizontal  
"Soft=Mud" Machine.

More in use than other of its class.

The —  
**"Iron Quaker"**  
**Brick Machine**

Unquestionably the —  
Leading Upright  
"Soft=Mud" Machine.  
Horse and Steam Power.

More "Quaker" Machines in use  
than any of its class.



GEO B PERRY Press

TELEPHONE CALL 5-4

A D CADY, Trans

**MECHANICVILLE BRICK CO.**  
HIGH GRADE BUILDING BRICK  
Special Shapes to Order  
CAPACITY TEN MILLION  
YARDS LOCATED ON  
O & H R & CHAMPLAIN CANAL

*Mechanicville, N. Y.* Oct. 22, '98

The Wellington Machine Co.,  
Wellington, O.

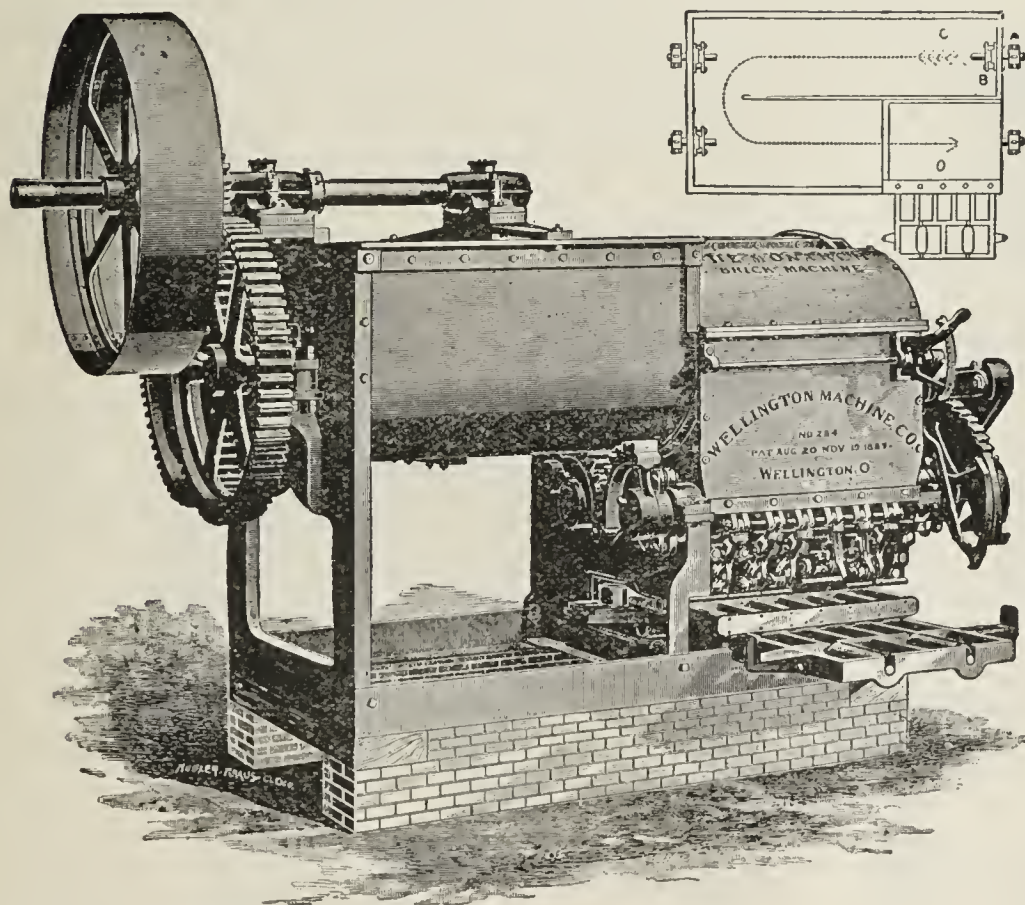
Gentlemen:-

We have now nearly finished the season, using your "Monarch" Machine on one of our yards, and feel warranted in expressing our opinion of its merits.

We have been making brick for about 18 years, and have used many different machines trying to find the best. We aim to make the best common brick that can be made, and are very particular in our equipment. We had some question at first as to the strength of the machine for our work as we press very stiff mud, but we are happy to say that the "Monarch" has fully met our requirements and has given us less trouble than any of the ten machines we have used since we commenced manufacturing. Many manufacturers have called to see it, and they are invariably much pleased with the machine and the quality of work it does. In fact, we can give our unqualified commendation to the "Monarch".

Yours very truly,

*Mechanicville Brick Co.*  
*J. A. Steady Jr*



We have the Best and Lowest Priced

## Mold=Sander.

No one else makes . . . .

**BALL-BEARING  
TRUCKS and BARROWS.**

The Greatest Improvement in small articles  
ever put upon a brickyard.

ALL OTHER AUXILIARY TOOLS,  
MACHINES AND SUPPLIES.

# The Wellington Machine Co.,

Send for Circular.

Mention the Clay-Worker

**WELLINGTON, OHIO.**



## EDITORIAL NOTES AND CLIPPINGS.—Continued.

himself, but will be pleased to correspond with parties looking for a good location for a paving brick plant. Our correspondent says Cambridge is a town of 8,000 population, in the heart of an inexhaustible coal field, with an abundant supply of gas and water and shipping facilities not surpassed by any town in Ohio.

Jacob H. Nass, a retired brick manufacturer of Atchison, Kan., died December 1. Mr. Nass was born in Prussia, and came to this country in 1857, and located in Doniphan, Neb. The next year he removed to Atchison and established the first brick plant there, and continued in the business until a year or two ago, when he turned the business over to his sons and retired from active business life.

The Henry Martin Brick Machine Manufacturing Co., Lancaster, Pa., write that their sales for 1898 have been greatly in excess of 1897. They say: "The outlook for the coming year is exceptionally bright with us. We have some very valuable new features connected with our latest improved soft-mud machine, and which are highly appreciated by those who have adopted these improvements lately."

T. N. Carmichael, the clay-steamer man, of Wellsburg, W. Va., in a recent communication says: "In addition to my clay-steamer, I am making arrangements to furnish the Carmichael screen, which has from four to seven times more actual screening surface than any other in use, and also the Carmichael automatic cutting table, which has 60,000 capacity and makes an all-down cut, which prevents sharp clogging if the clay should become soft. Will give you more details as to cutting table later."

The Jeffery Manufacturing Co., of Columbus, Ohio, have recently taken up the manufacture of the Columbian Separator Screen and Bolter, and advise us that they have erected an experimental machine at their works for the testing of such material as may be sent them for that purpose. Parties interested in the screening or separating of cement, cement clinker, ores, phosphate rock, marble, fertilizer materials, bone ash, plaster paris, sand, coal, earth, clay, etc., can secure further data and prices by addressing the manufacturers.

## PACIFIC COAST NEWS.



OW THAT THE WINTER has set in, the building trade of San Francisco is dull, which means that less brick is being used; the brick industry suffers. The same condition prevails throughout the State, although not to such a marked degree as in San Francisco. While demand for brick is not great, the yards are running, and some

are turning out lots of sewer pipe, for which there is a great demand in some sections. Considering the drought, which has caused all lines of trade to suffer during this year, the present condition of the brick industry could not well be otherwise.

Gladding, McBean & Co. do not report any change in conditions. They are still going on in their usual way, and are always prepared to fill orders when they come along.

N. Clark & Sons are not busy on brick and terra cotta orders, but they have quite a demand for sewer pipe.

The brickyard at South San Francisco, San Mateo county, Cal., has closed down for the season.

The Steiger Terra Cotta and Pottery Company has incorporated, with the principal place of business at San Francisco. The capital stock is \$100,000. The directors are: J. W. McDonald, F. B. Bishop, H. Dutard, C. H. Stone, W. E. Denison, J. W. McDonald, Jr., L. A. Steiger, all of San Francisco.

The large amount of brick building now going on at Vancouver, B. C., has created such an active demand for building brick that there is talk of starting a brickyard to manufacture brick on an extensive scale. The brick now being made there does not seem to give perfect satisfaction, and Eastern capital is being asked to form a company to manufacture pressed brick and other building material.

The California-Portland Cement Company has incorporated at San Bernardino, Cal., with a capital stock of \$80,000. The incorporators are J. P. Culver, F. H. Jackson of Los Angeles, Cal., and others. The principal place of business is Los Angeles, Cal.

The first carload of fuller's earth prepared in California and taken from the deposit recently discovered near Bakersfield, Cal., has been sent to San Francisco, and will be distributed among a number of firms there. At present the grinding capacity of the plant is only three tons a day, but if it can be shown that the Griffin machine can reduce the clay in a wet state, a plant of fifty tons capacity will be put in at the mine. A test is now being made in Philadelphia of the ability of the Grinn machine to work the earth wet. The deposit of Fuller's earth is of excellent quality, and as is well known, is very useful in the manufacture of porcelaine and chinaware.

The contract for the brickwork on the four-story building to be erected by O. T. Johnson, at Los Angeles, Cal., has been awarded to the Berg-Bradley Company. The contract price for the brickwork is \$8,000, the entire building to cost \$20,000.

The new kiln at Snyder's lime-works, at San Jacinto, Cal., is now ready to be fired. This makes two kilns at the works of a capacity of three thousand barrels per month each.

The brickyard at Walla Walla, Wash., has closed for the winter.

Alexander Gordon, of Weiser, Idaho, was recently in Baker City, Oregon, looking for a location for the manufacture of brick, and may decide to locate in Baker City.

The first kiln of brick ever burned in the Condon, Ore., brickyard has cooled. The brick are of first-class quality.

Taylor & Heath, proprietors of the tile factory at McMinnville, Ore., report business good. Within two weeks they shipped five carloads to the Broadmeade farm, near Amity, and two carloads to Portland.

The Weston, Ore., brickyard has sold a quarter of a million bricks to J. L. Jones, contractor, for the brewery to be erected at Walla Walla, Wash., by Jacob Betz.

The McMahon brickyard, at Portland, Ore., has been leased by Krebs Bros., for a term of five years. The yard was not run last season, but the lessees are fitting it up for next year's run.

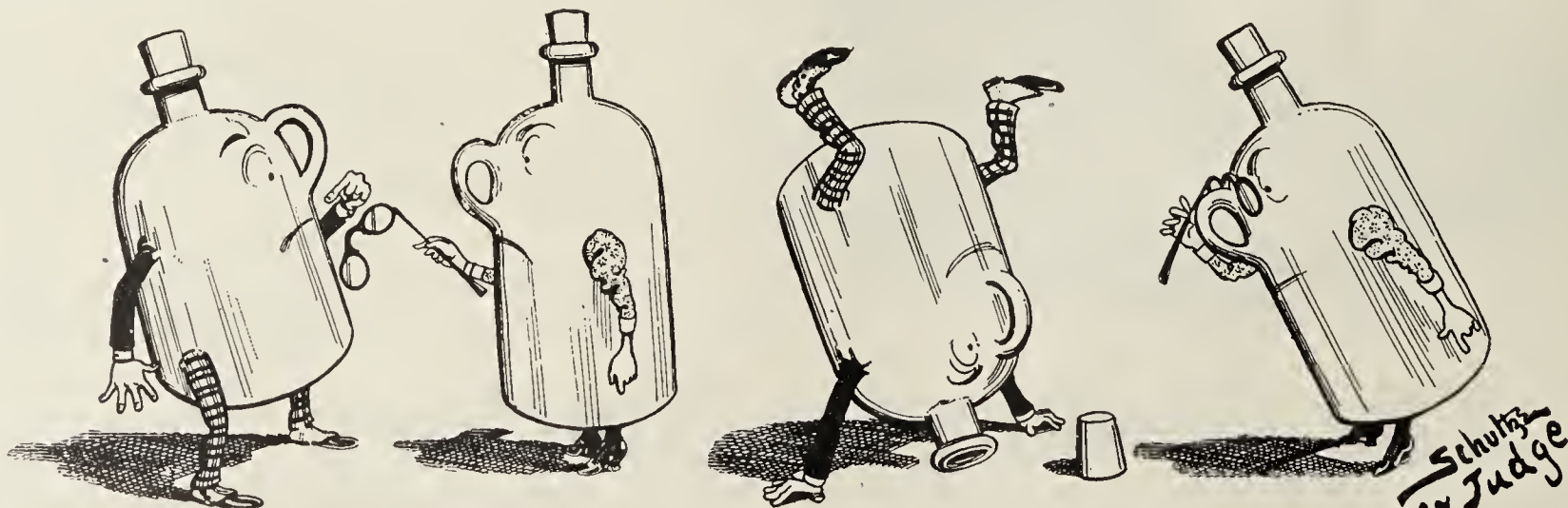
SUNSET.

## VANDALIA LINE.

5—Daily Trains to St. Louis, Mo.—5

Leave Indianapolis 7:20 a. m., 8:10 a. m., 12:35 noon, 7:05 and 11:35 p. m. Local sleeper on 11:35 p. m. train, ready for occupancy at Union Station, 8:30 p. m. For tickets and sleeping-car space, call on agents, No. 48 West Washington street, or Union Station.

W. W. RICHARDSON, D. P. A.



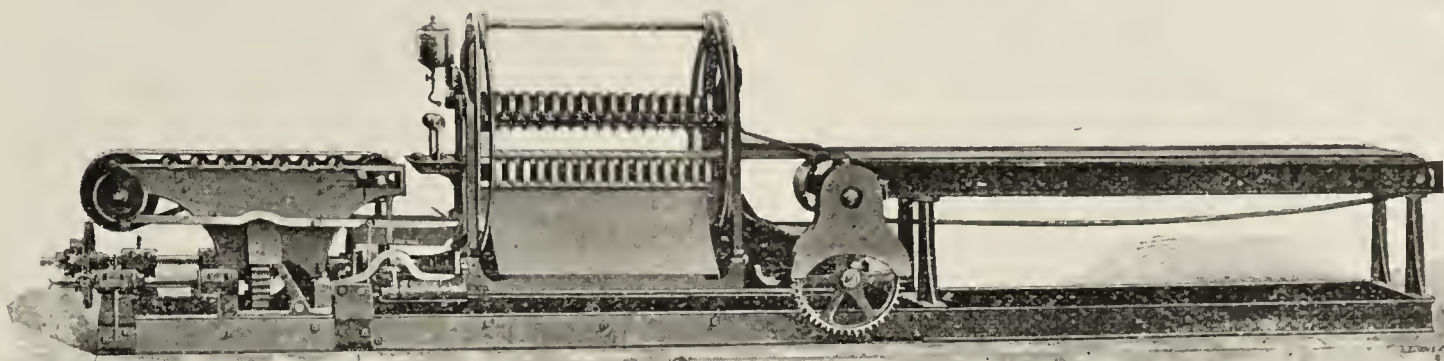
1. "Juglets, you've been drinking again."

2. "No, my dear; not a drop. See?"



# The Wonder Clay Working Machinery

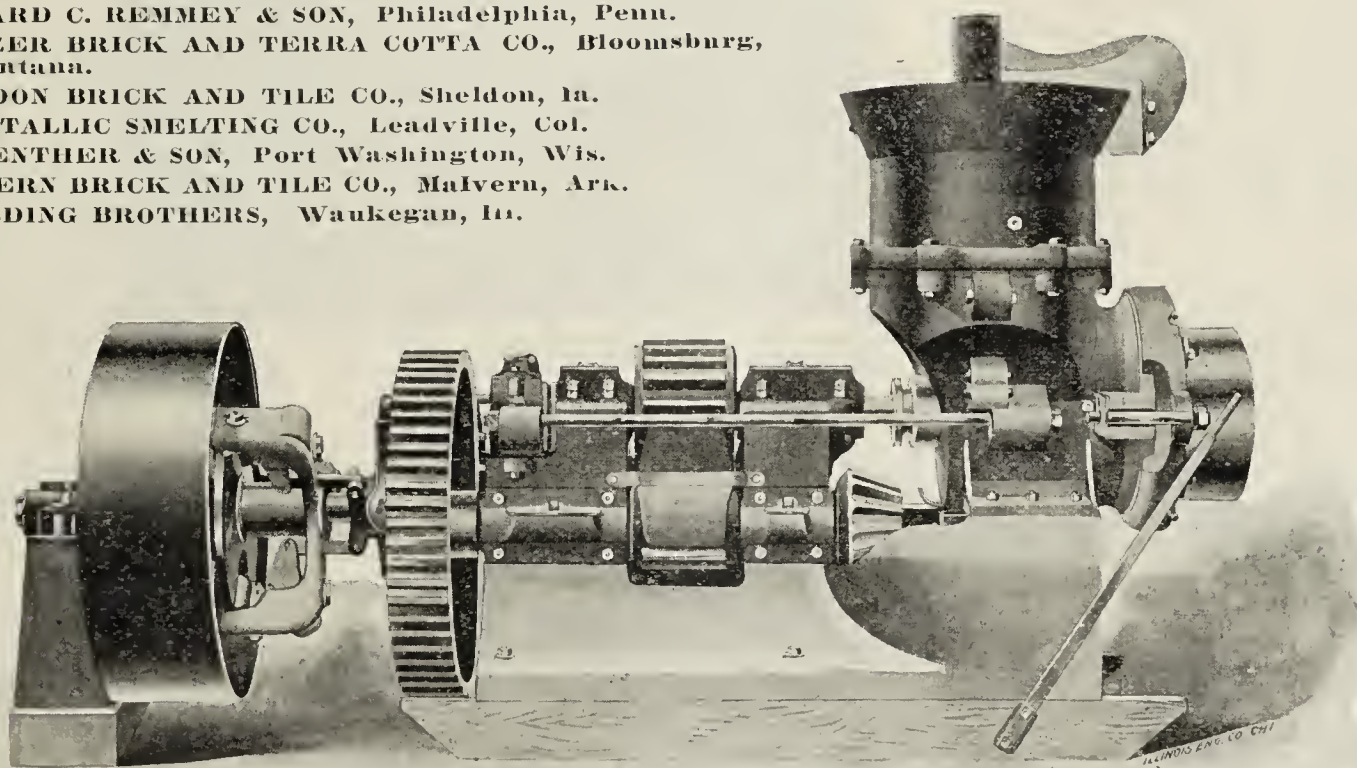
And a Few of its Friends:



Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.

NEWBERG PRESSED BRICK AND TERRA COTTA CO.,  
Newberg, Ore.  
GALESBURG PAVING BRICK CO., Galesburg, Ill.  
HENRY C. ADAMS, Edge Water Park, N. J.  
BOSTON FIRE PROOFING CO., Boston, Mass.  
LONG ISLAND BRICK CO., Greensport, L. I.  
O'BRYAN & GREEN BRICK CO., Greenville, Ky.  
WILLIAM TAYLOR & SON, Carleton Place, Ont.  
DUVALL BRICK AND TILE CO., Duvall, O.  
ELDORA BRICK AND TILE CO., Eldora, Ia.  
N. Y. ARCHIT'CT'L TERRA COTTA CO., New York City.  
JOHN M'FARLANE & SON, Lawrence, Kan.  
RICHARD C. REMMEY & SON, Philadelphia, Penn.  
SWITZER BRICK AND TERRA COTTA CO., Bloomsburg,  
Montana.  
SHELDON BRICK AND TILE CO., Sheldon, Ia.  
BI-METALLIC SMELTING CO., Leadville, Col.  
G. GUENTHER & SON, Port Washington, Wis.  
MALVERN BRICK AND TILE CO., Malvern, Ark.  
SPAULDING BROTHERS, Waukegan, Ill.

GRAND RAPIDS BRICK CO., Grand Rapids, Mich.  
VICTOR RANDALL, Sylvan, Portland, Ore.  
W. G. WHEATCROFT, Grayville, Ill.  
GRAND RAPIDS CONSOLIDATED BRICK AND TILE CO.,  
Grand Rapids, Mich.  
R. B. MOODY, De Land, Ill.  
T. SAUSELEIN, Merchantsville, N. J.  
MARTIN BRICK CO., Minneapolis, Minn.  
JAMISON-FRENCH FIRE CLAY CO., St. Louis, Mo.  
FRED H. VANDER HEYDEN, Ionia, Mich.  
DENVER SEWER-PIPE AND CLAY CO., Denver, Col.



We  
Pleased  
Them  
Why  
Not  
You  
As  
Well.

The Wonder Tile Machines, made in two sizes.

## Wallace Mfg. Co.,

CHICAGO AGENTS:

Chicago Brick Machinery Co., Chicago, Ill.

FRANKFORT, IND.

(More Names on Back Inside Cover Page.)



**FOR SALE, WANTED, ETC.**

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

**WANTED**—A genuine, all around good man, who understands burning brick with coal. First class recommendations required.  
121 d WOLSELEY, care Clay-Worker.

**WANTED**—Superintendent for Brick Plant, using Chambers improved stiff mud machine. Must be first class burner, and possessed of executive ability. Address with references,  
121 d P. O. BOX 1310, New Orleans, La.

**WANTED**—A second-hand 26 inch Newell crusher; also 50 inch green brick car, 24 inch gauge, with upper decks, for stiff mud brick.  
121 cm S. GRAHAM & CO., Bordentown, N. J.

**WANTED**—Position as superintendent by an expert brickmaker and burner; one who understands the construction of a brickyard in all its details; 15 years' experience; best of reference. Address  
121 c H. M., care of Clay-Worker.

**WANTED**—Situation as superintendent or foreman of brick works; soft mud, stiff mud, up draft kiln; good references; 25 years experience; would make by the thousand. Address  
122 cm MASS, care Clay-Worker.

**WANTED**—Position as superintendent or burner; hollow ware, fire, dry press, building or paving brick plant; up or down draft kilns; the best of reference.  
121 cm A WORKER, care Clay-Worker.

**FOR SALE, CHEAP**—Second-hand auger brick machine of large capacity, and as good as new; a real bargain to anyone wanting a good stiff clay brick or tile machine. For price, etc., address  
123 d "WIRE CUT," care Clay-Worker.

**FOR SALE**—One four-mould Boyd Dry Press; one Carmichael Clay Steamer, elevator, shafting, etc. All in good condition. Correspondence solicited. Address  
121 d STANDARD BRICK CO., care Clay-Worker.

**FOR SALE**—Sewer pipe press, just the thing for large tile or county ditch pipe; dies from 3 inches to 24 inches, and several others with two cluster dies for drain tile.  
121 d "PIPE PRESS," care Clay-Worker.

**FOR SALE**—One second-hand Jonathan Creager soft mud machine, one second-hand Potts disintegrator, one pug mill, one turn-table, complete set of molds, racks, and pallets, sufficient for this outfit; the above will be sold very low to insure a quick sale. Address  
121 d "B. 100," care Clay-Worker.

**WANTED**—Situation as manager. Will take entire charge of plant. Experienced in the manufacture of fire, building, paving, hollow and other brick and tile, pipe and other clay goods. Up and Down draft, continuous and other kilns. Address  
121 c L. H., care Clay-Worker.

**FOR SALE**—As receiver of Stafford & Gooch Bros., I will sell at public sale on January 2, 1899, on the premises, at Fortville, Hancock county, Indiana, one complete brick plant; a fine opening for some one.  
121 d JAMES M. CROUCH, Receiver, Fortville, Ind.

**FOR SALE.**

One Bucyrus, O., Giant brick machine.  
One Bucyrus, O., iron pug mill.  
One Brewer & Co. No. 6 brick and tile machine, with brick dies and tables and tile dies and table, from 3 to 16 inches, inclusive; these machines have been used but little, and are practically as good as new, and will be sold very cheap. Address:  
122 d SPURCK & GRIGSBY, 423 S. Adams St., Peoria, Ill.

**FOR SALE**—One good second-hand Chambers machine, 25,000 daily capacity; write for particulars. Address  
CHAMBERS BROS. Co.,  
52d, below Lancaster, Philadelphia, Pa.  
122 d

**FOR SALE.**

The Hedrick Brick and Tile Plant can be had at a bargain if taken soon; it has a large shipping trade on tile for all it can make, and has steam dryer. For further particulars and reason for wanting to sell apply to  
122 cm F. W. HEIDENREICH, Hedrick, Ia.

**WANTED**—First-class kiln burner. SAN ANTONIO SEWER PIPE & MFG. CO., San Antonio, Tex.  
121 d

**FOR SALE OR LEASE.**

A well equipped Virginia brick plant, near a large city, affording a good market. The present price of common brick is \$7 a thousand, Pavers \$9 to \$10. Abundance of excellent clay and cheap fuel. A splendid opportunity for a practical, industrious man. For full particulars address  
121 d "WIDOW," care Clay-Worker.

(Continued on Page 478.)

# Anglo-American Pottery.

## Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

**EDWIN A. BARBER, A. M., Ph. D.**

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc., and Honorary Curator of the Department of American Pottery and Porcelain, Pennsylvania Museum and School of Industrial Art, Philadelphia.



"The Dam and Water Works," Philadelphia, (Stern wheel Steamboat.)

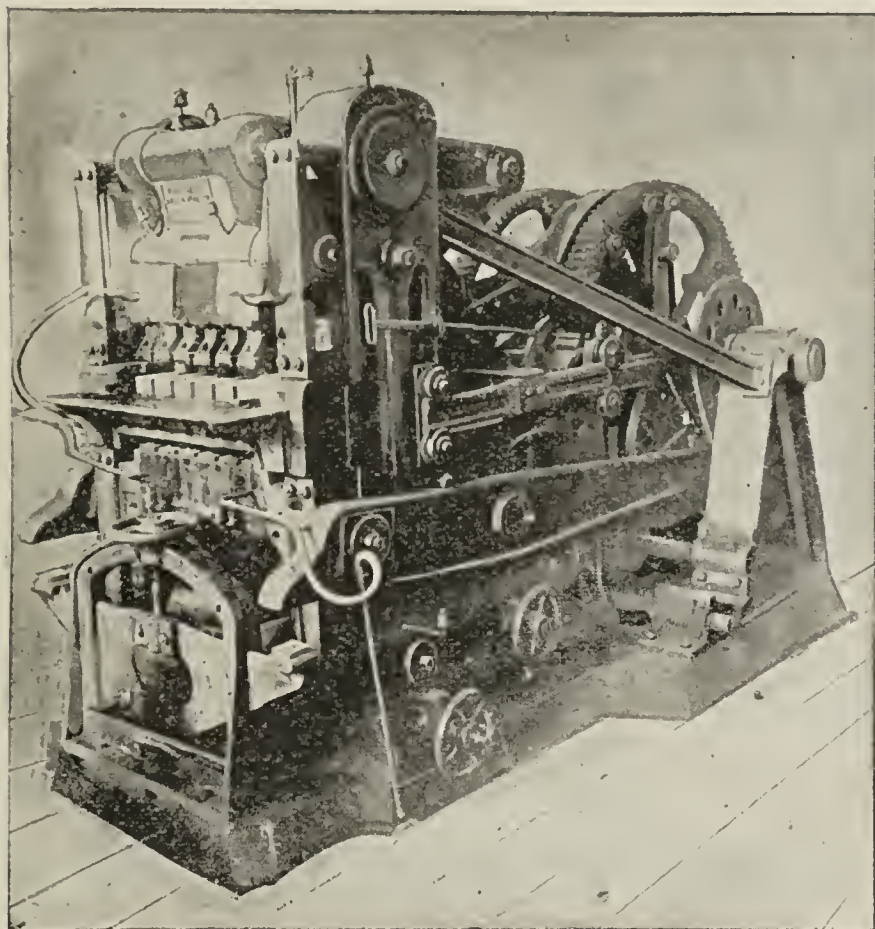
**A**T THE SOLICITATION of many collectors, the illustrated articles on the above subject, which have been appearing in THE CLAY-WORKER during the present year, have been revised, rearranged and enlarged and will be republished in book form. The work will consist of about 150 pages and will contain about 100 illustrations. It is now in press and will appear about February. The border designs of plates, and types of pitchers have been classified, the designs numbered for convenience of reference, and a complete Index added which will serve as a check list for private and public collections. Nothing of this kind has ever been published, and it will be invaluable to collectors.

The edition will be limited to 1,000 copies. Price, \$1.50 per copy; by mail, 10 cents extra; by express, at the expense of the person ordering. Remittances should be made by Draft or Check, Postal or Express Money Order, to

**T. A. RANDALL & CO.,**  
The Clay-Worker.  
INDIANAPOLIS, IND.



# The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

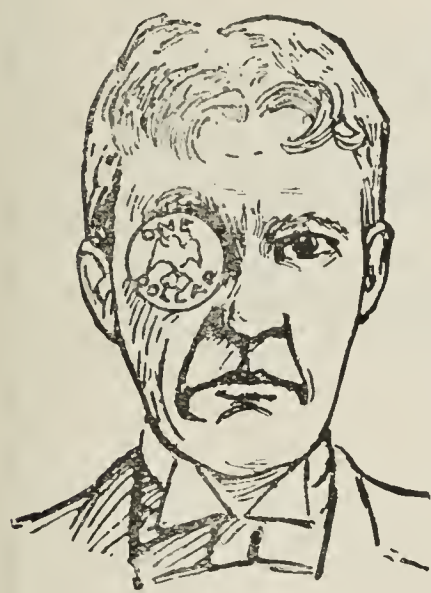
Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE  
ON APPLICATION. . . . .

**Progress Press Brick and Machine Co.,**

King's Highway and Oak Hill R. R.

**ST. LOUIS, MO.**



## The Man With the Dollar in His Eye

Thinks he will run his old machinery next season and **Save Money.** His machine is ancient in design, slow and wasteful. Besides, it is liable to sudden and unaccountable breakdowns in the busiest part of the season. The brick don't do his clay justice. But it will run somehow part of the time and he says it is "Good Enough."

If this man don't change his ideas, all the Dollars he will get next season will be—**In His Eye.**

The way to put Dollars in your pocket is to install our **Up-to-Date Machinery** this Winter. Our machines are all money-makers, and we have them for all systems.

The first step is to write us for cuts and information. We have plenty of both.

Now do you want your **Dollars in your Eye or in Your Pocket?**

**CHICAGO BRICK MACHINERY CO.,**

**225 DEARBORN STREET.**



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—MANUFACTURERS OF—

# Vitrified Paving Brick,

DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities

Estimates on Brick pavements cheerfully given.

The Clinton Paving and  
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Manufacturers of the Highest Quality of

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Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

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The Standard Shale Block for  
Street Paving.

Manufactured at Brazil, Ind., by the

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MANUFACTURERS OF

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# The Purington Paving Brick Co., of Galesburg, Illinois,

**H**AS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business. Correspondence respectfully solicited.



**FOR SALE** — One of the best paying brick and tile factories in Iowa.  
12 tf d Lock Box 36, Lohrville, Ia.

**WANTED** — About fifty iron cars with racks for pallets for drying soft mud brick in tunnel dryer; also three transfer cars.  
12 1 d "HENRY," care Clay-Worker.

**WANTED** — Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.  
10 tf d care Clay-Worker.

**WANTED** — A burner to take charge of my kilns; one who has had long experience in burning and glazing sewer pipe; must be well recommended and start in on trial; state where last engaged. Address  
12 2 d SEWER PIPE, care Clay-Worker.

**WANTED** — Position as superintendent or manager by man of 15 years' experience. Have good position, but on account of bad health of family would like to change.  
Address SUPERINTENDENT,  
12 1 c care Clay-Worker.

**FOR SALE** — To settle two estates we offer for sale the splendid plant of the Spurck Street Paving Brick Co., of Peoria; best of shale clay; cheap coal; brick stand highest test; a home market for entire output. For further information and prices address  
12 2 dm SPURCK & GRIGSBY,  
423 S. Adams St., Peoria, Ill.

**SITUATION WANTED** — The undersigned, a man of fifteen years experience in the construction of brick kilns, retorts, furnaces, etc., as well as brick buildings of every description, wants to secure a situation after January 1, 1899, with some reliable firm to superintend the construction of similar work. Not afraid to work and can furnish first-class references.  
R. N. BUELL, Box 454,  
12 1 d New Britain, Conn.

**FOR SALE** — The Hawarden Brick and Tile factory, partially destroyed by fire, at a bargain. Large tributary territory and unlimited supply of excellent shale. Samples can be seen at the Clay-Worker office, or will be sent upon application. Correspondence solicited. Address,  
11 2 cm FIRST NATIONAL BANK,  
Hawarden, Iowa.

**FOR SALE** — Brick and Tile plant located in Central Illinois. Run nine months this year (1898), and still running. Good trade at good prices for cash. Kiln capacity, 300,000 brick; steam dry room for 100,000 brick. Best of shale. Two railroads in yard. Coal 50 cents per ton on yard. Other business demanding attention cause for wanting to sell. Address,  
11 3 c. BRONAUGH BROS.,  
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**WANTED** — A practical brickmaker to run a plant. One with small capital to take half interest in the business. Made this season 1,500,000. All sold and could have disposed of 5,000,000. This offer made on account of death of one of the partners. Plant situated in Tidewater, Virginia. Books open for inspection to party who means business. A rare opportunity for the right man. Address,  
11 3 cm TIDEWATER,  
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#### FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.  
6 spring brick trucks.  
Lot shafting, belting and pulleys.  
1 Barr Pumping Company steam pump.  
All new or little used, and in excellent condition.  
10 tf d WALNUT,  
Care Clay-Worker.

#### FOR SALE.

Every one a bargain—all as good as new.  
One 4-mold Dry Press Brick machine, 20 M daily Capacity.  
One double mold Repress No. 4, 20 M daily capacity.  
Two hand Represses, 3 M daily capacity.  
One No. 8 Auger Brick machine and one No. 8 Pug Mill, each 40 M daily capacity.  
One No. 8 Board Delivery Side Cut Cutting Table.  
One No. 5 Board Delivery Side Cut Cutting Table.  
For prices, etc., address  
LANDPOOR, care Clay-Worker.

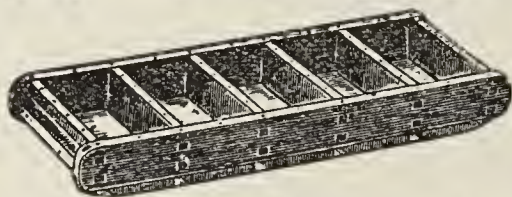
#### FOR SALE, DRY PRESSES.

I have two Simpson Dry Presses, that are just as good as new, that I will sell for \$1,500 each, F. O. B., Cleveland, Ohio. These presses cost \$3,500 each. FRANK B. MANY,  
809 Cuyahoga Bldg., Cleveland, Ohio.

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MANUFACTURERS OF ALL KINDS AND SHAPES OF

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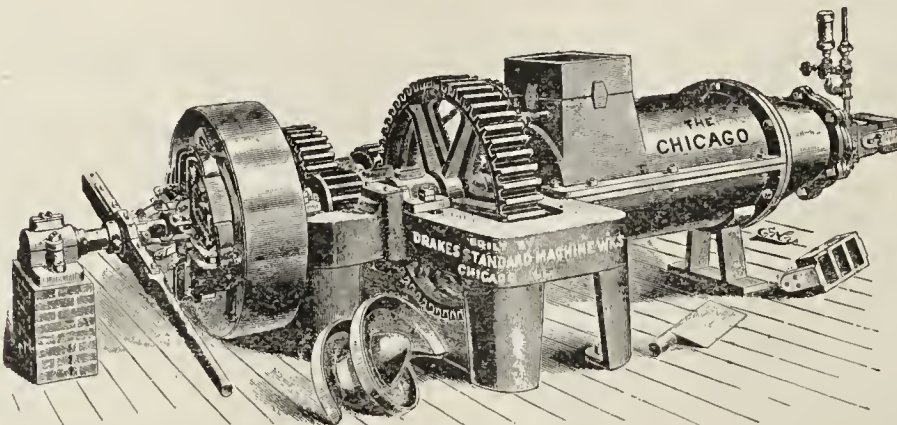
55 and 57 Market St., CHICAGO, ILL.

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Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the Phillip's Fan Dryer will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The PHILIP'S DRYER is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

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Reward for information of infringements.

Ask for what they say of it, and address the Patentee.

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**WANTED**—One good kiln setter and one good brancher. Address  
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**FOR SALE**.—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address,  
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**FOR SALE**—\$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth \$2,500. Address F. D. BROWN,  
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**NO DRY PRESS BRICK PLANT** complete without the Carmichael Clay Steamer.  
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Inventor and Manufacturer,  
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**FOR SALE**—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.  
C. SIEDLER, Pres.  
9 t f d 156 Fifth Ave., New York, N. Y.

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Two four-mold Johnson semi-dry press brick machines and four represses. Used six months. Duplicates of this machinery can be seen working at the Christy Fire Clay Co's. Works, St. Louis, Mo. Reason for selling, not suitable for manufacturing vitrified paving brick. Address,  
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One Monarch machine, only used one short season.  
One extra heavy Quaker machine in good order.  
One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.  
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Seven narrow gauge and one standard gauge second-hand locomotives.  
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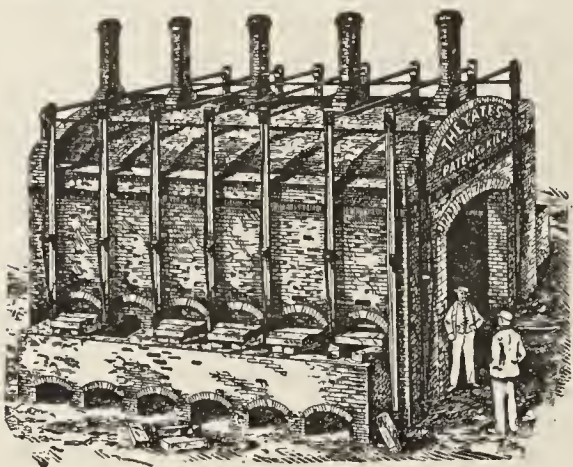
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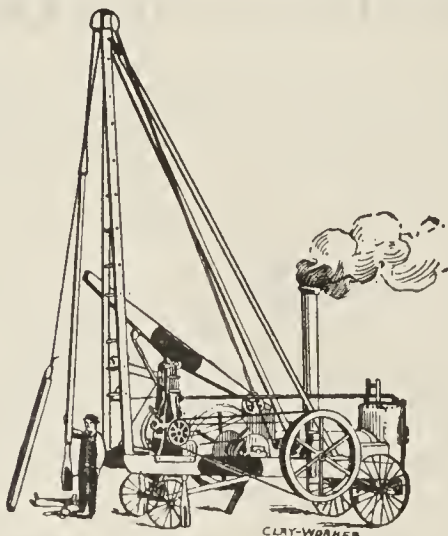
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Tanks of any size from 100 to 100,000 gallons capacity.

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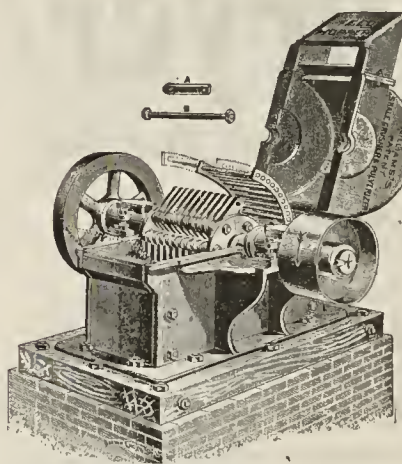
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ANTHONY ITTNER.

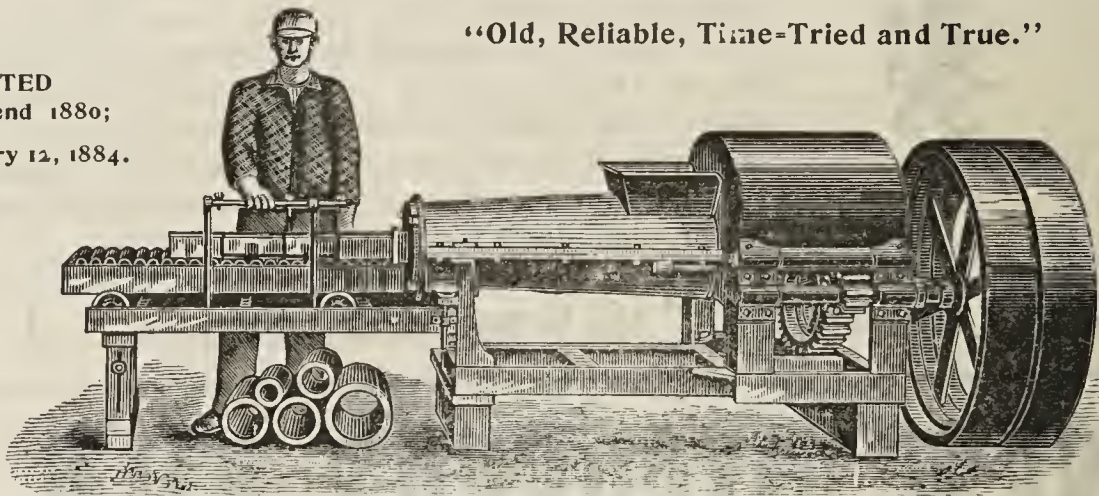
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THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

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We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

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Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.



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In Stock: Diaper Tile of all sizes, Caps, Coping, String and Belt Courses, Panels, Skewbacks, Etc.

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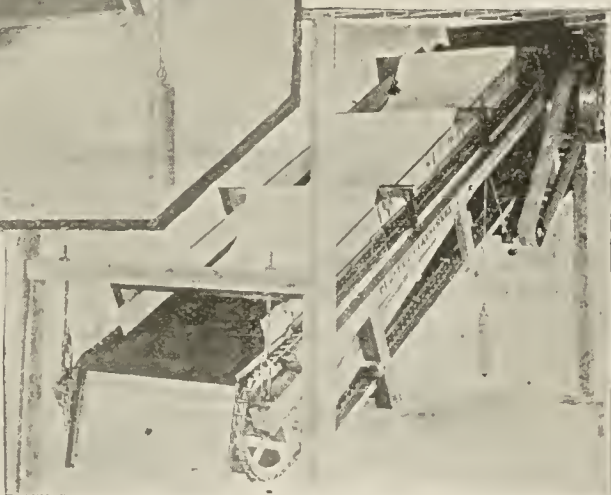
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This Screen positively Saves one man.  
Increases grinding capacity.  
Gives a finer grade of clay.  
Does the work as well in cold weather as in warm.  
Screens cold & moist clay as well as dry.  
It will more than save its cost in one Winter.



View on underside showing action of Rotary Brush

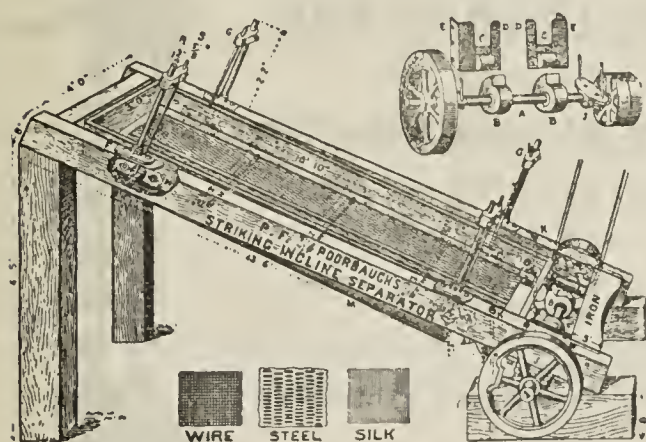
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### PRICES:

Steel bound machine moulds,  
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With Panel Bottoms, solid, 5 cents per brick extra.  
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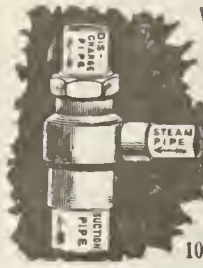
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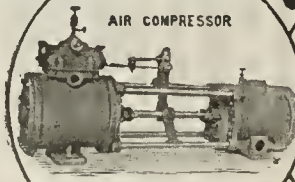
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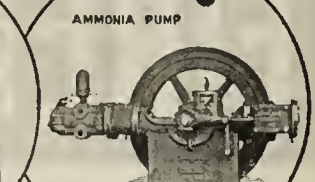
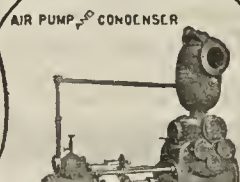
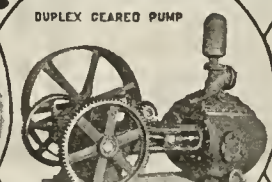
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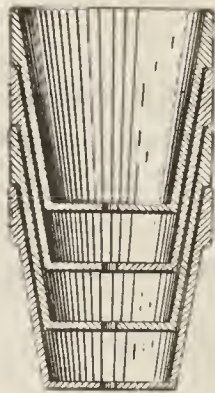


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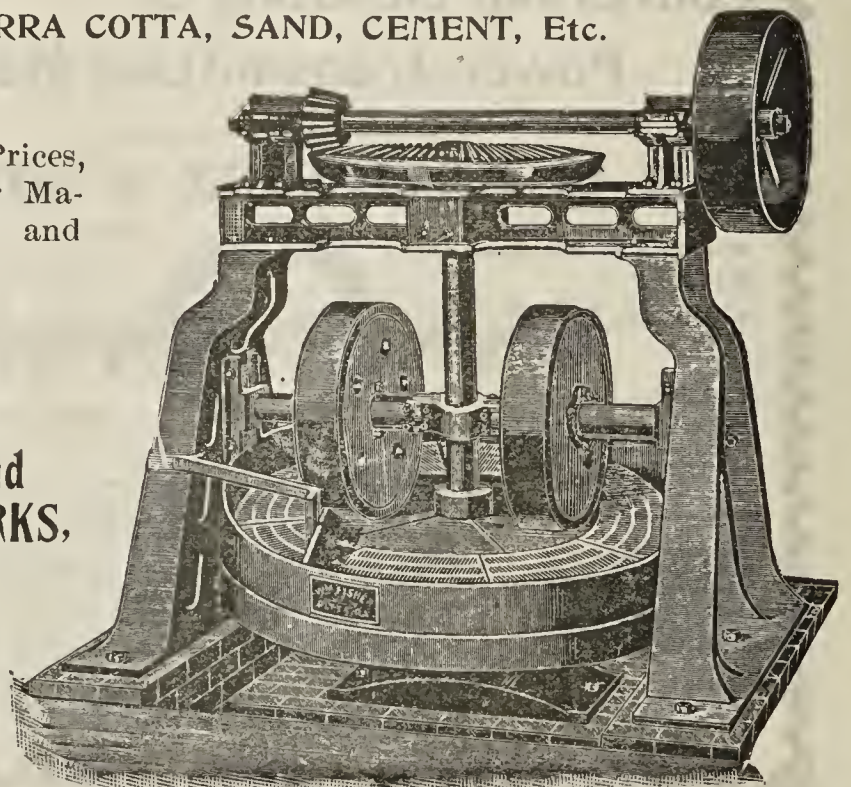
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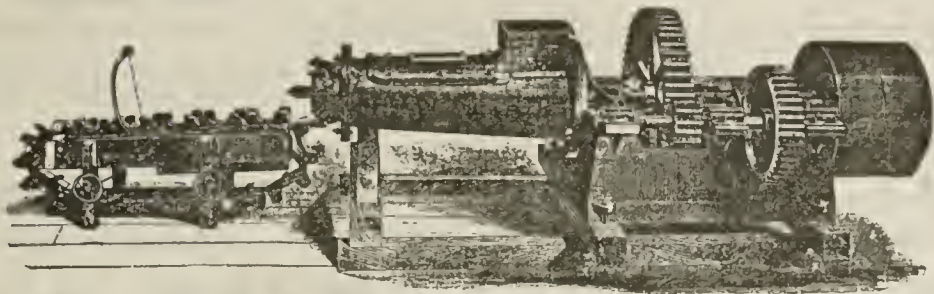


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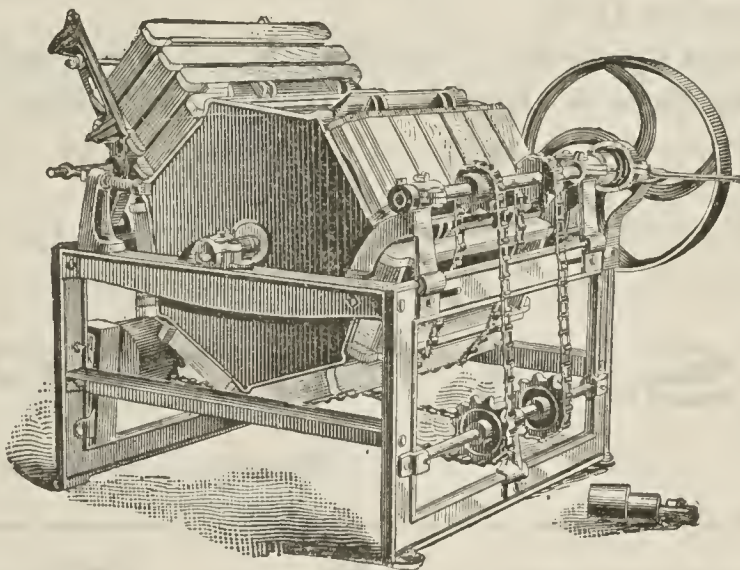
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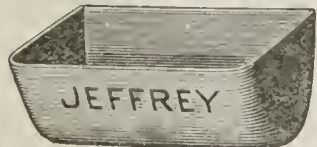
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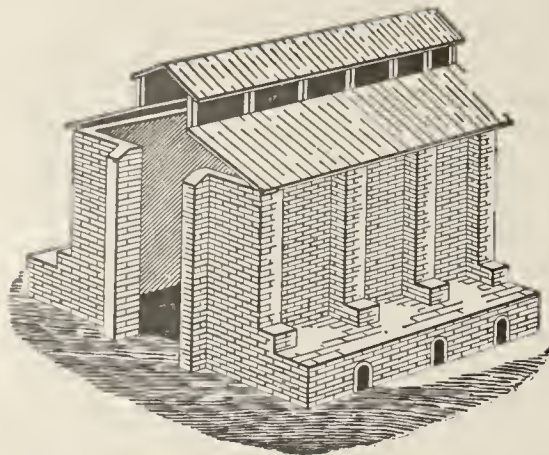
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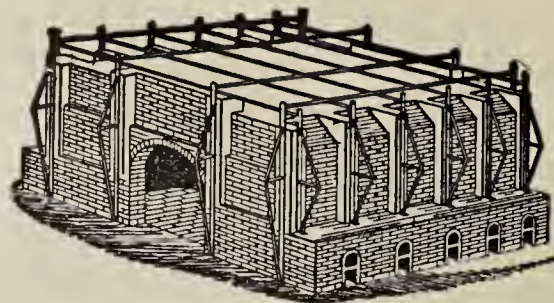
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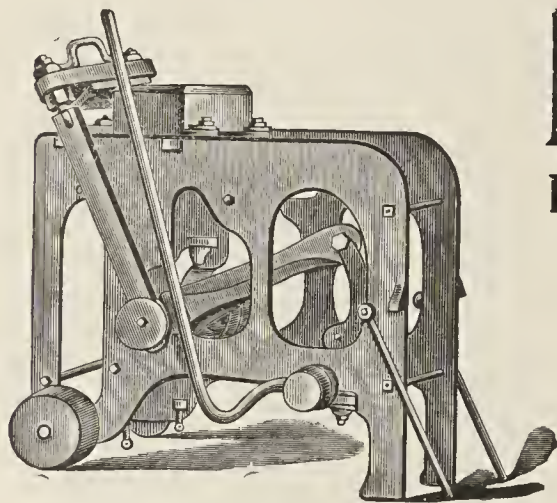
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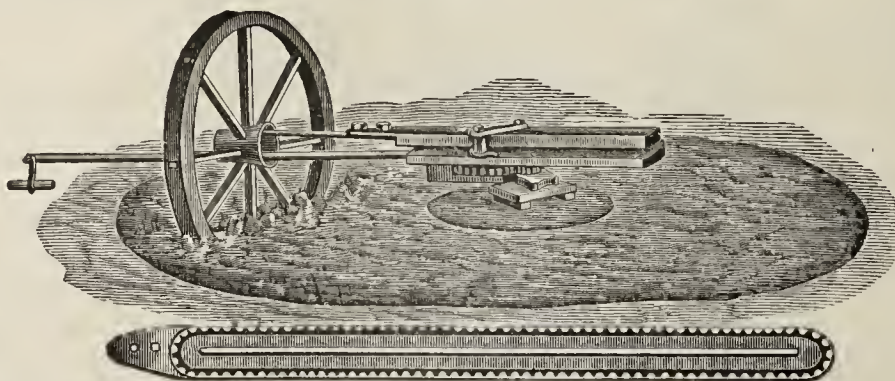
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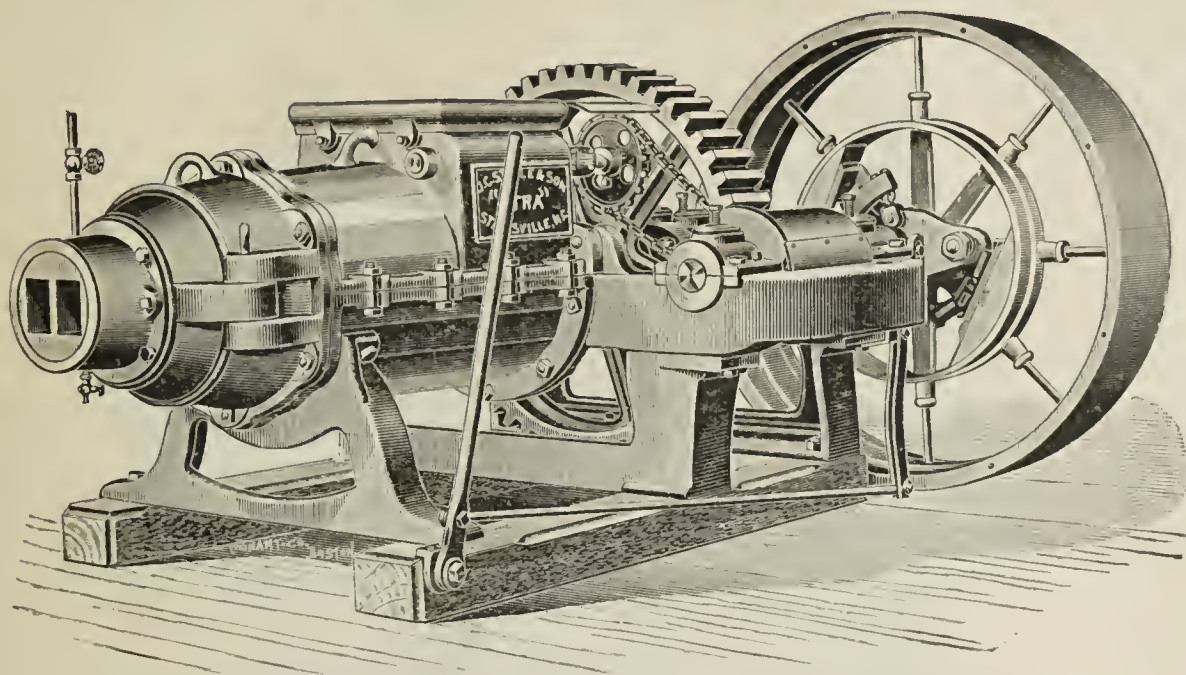
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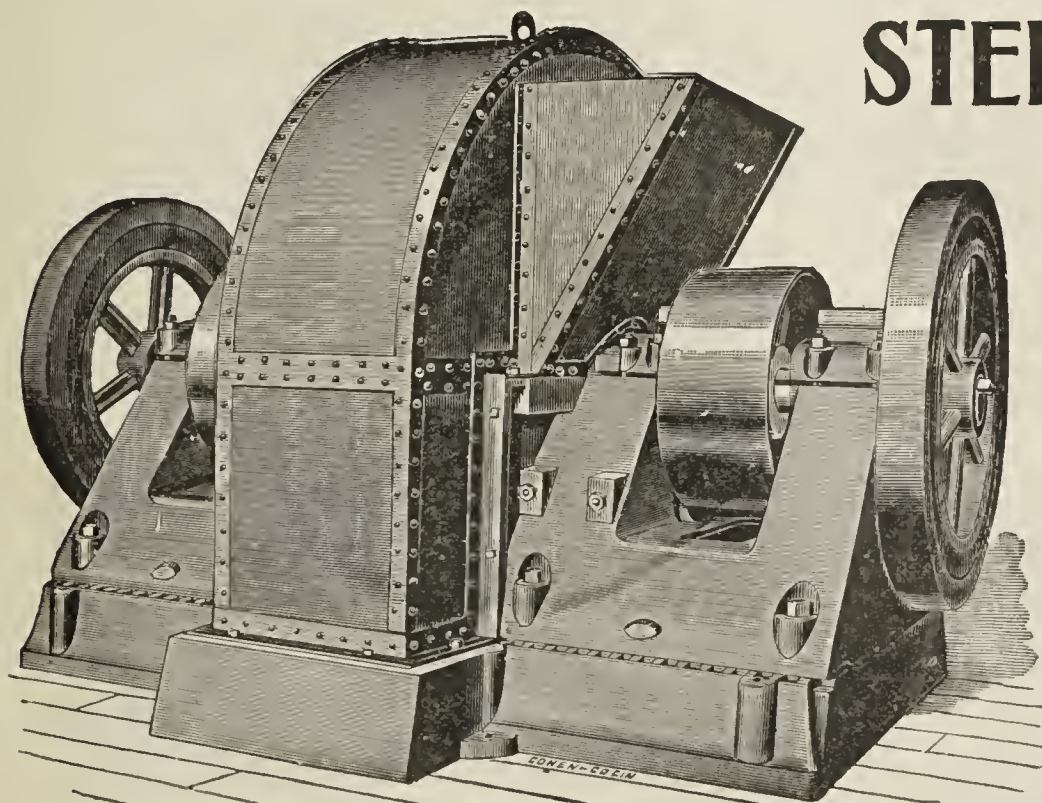
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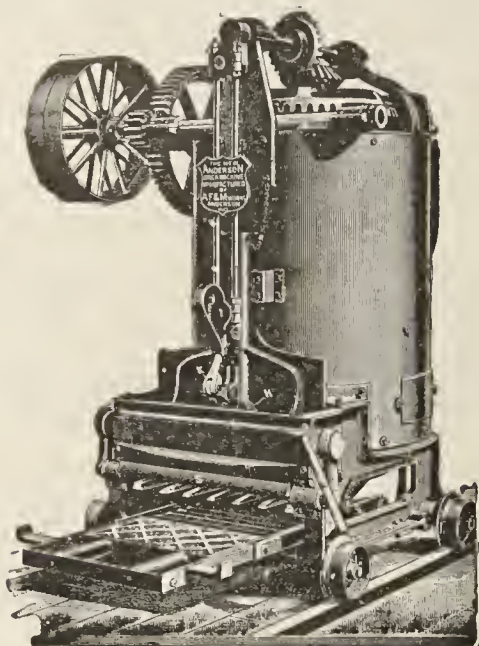
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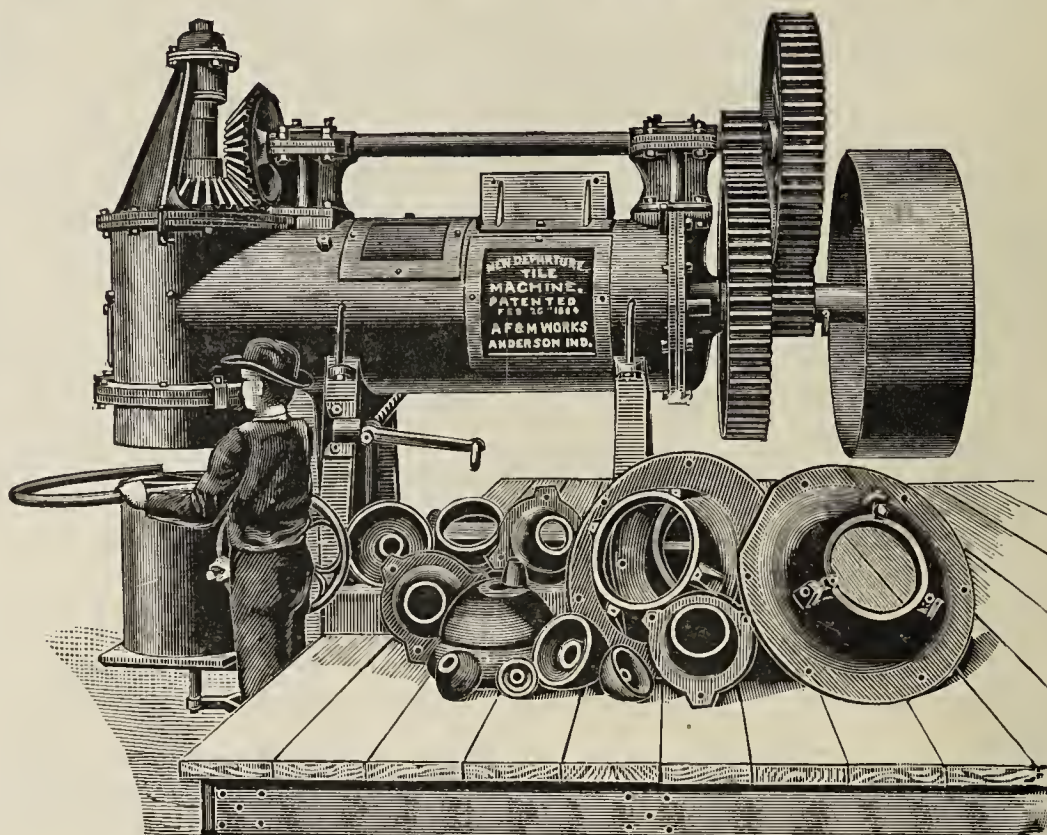
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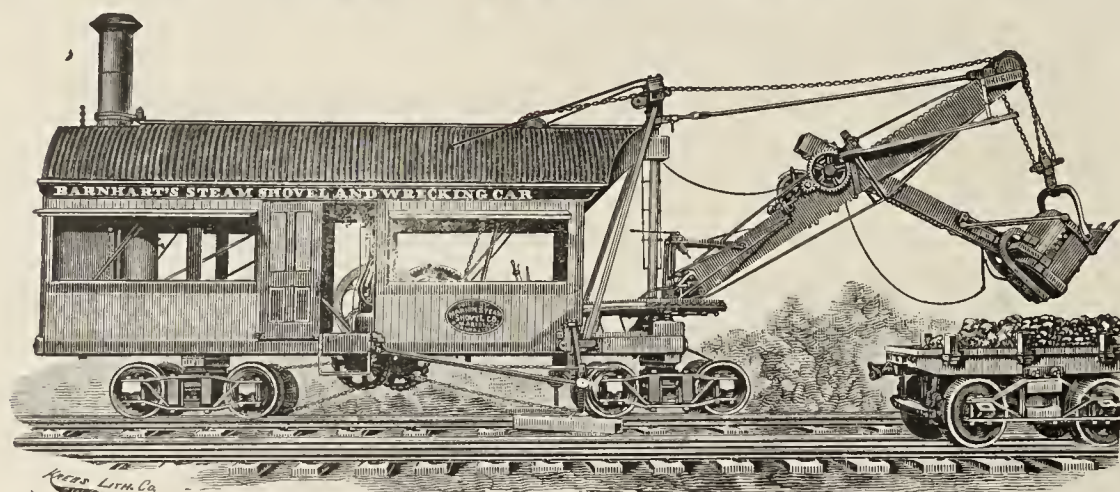
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## Steam Shovels for Brickyards.



STYLE A-1 1/2 YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1 1/2 yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (3/4 yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

**The Marion Steam Shovel Co.,**

603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

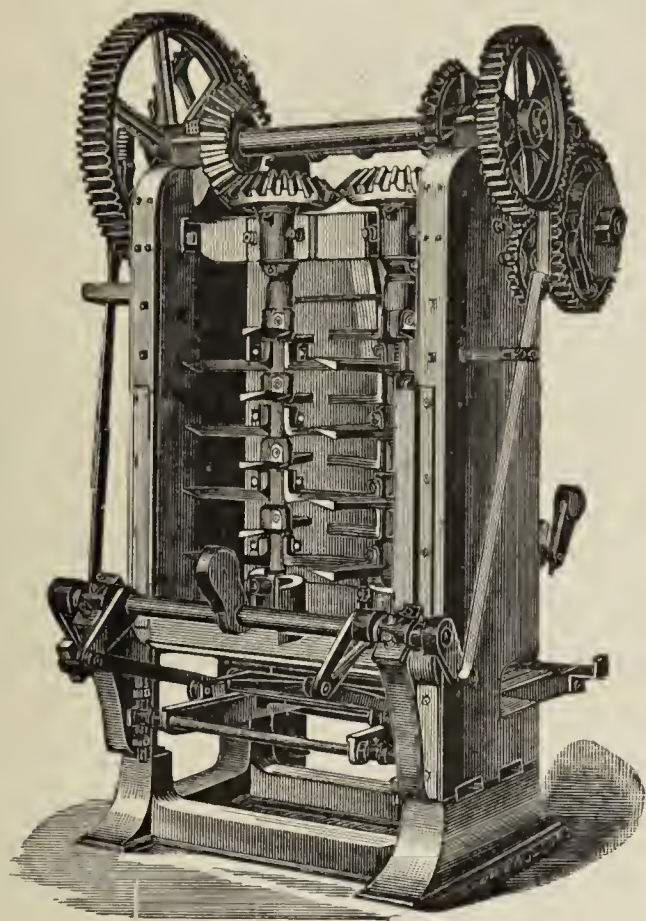


STYLE C-3/4 YD.



# THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



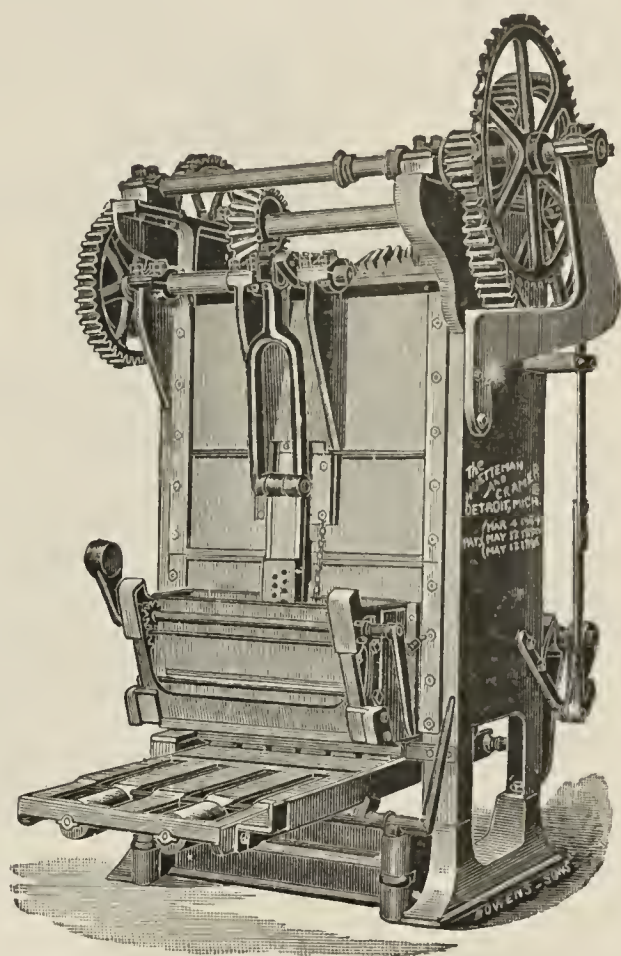
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE  
AND PRICES TO

The Huetteman  
& Cramer Co.,

Manufacturers of the Duplex Brick Machine and general outfit for  
brickyards,

12, 14 & 16 Sherman St.,  
DETROIT, - - MICH.



## THE HENRY MARTIN BRICK MACHINE MFG. CO.,

ESTABLISHED 1857.

LANCASTER, PA., U. S. A.

INCORPORATED 1887.

INVENTORS, MANUFACTURERS AND EXPORTERS OF STEAM AND HORSE POWER

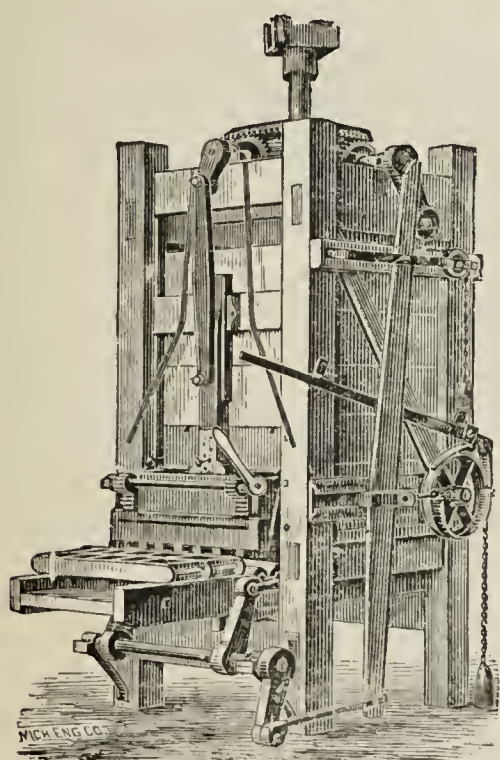
# Brickmaking Machinery.

Horizontal Pug Mills,  
Moulds, Patent Double and  
Single Decked Trucks,  
Barrows, Turn Tables, Etc.

Plans, specifications and illustrated Catalogue of complete plants will be furnished free of charge on application. We warrant our Machines to work in any kind of clay that can be worked by hand, and to make brick of any ordinary size.

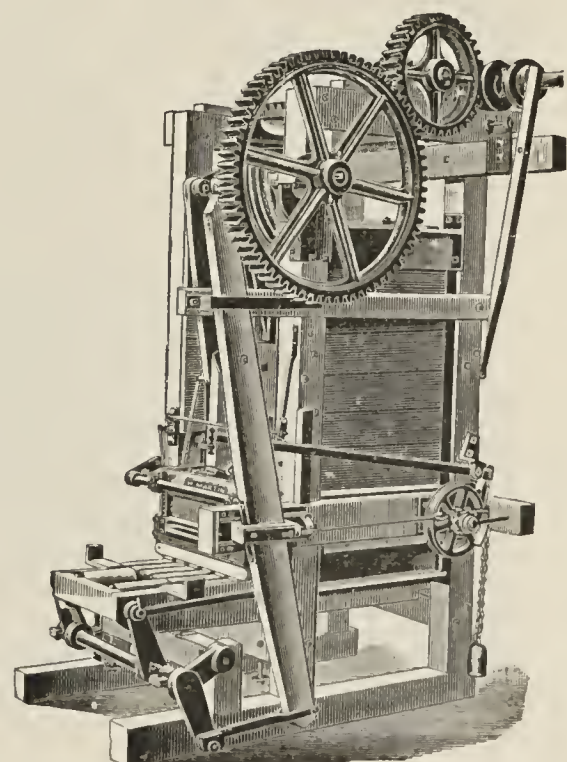
## Stone Crushers,

Clay Crushers, Sand Grinders,  
Clay Screens, etc., etc. . .



CAPACITY 2,000 BRICK PER HOUR.  
WEIGHT 5,200 POUNDS.

Telegraphic Address, ✕ Postal Telegraph-Cable Co.  
"Martin, Lancaster." ✕ wires in our Office.

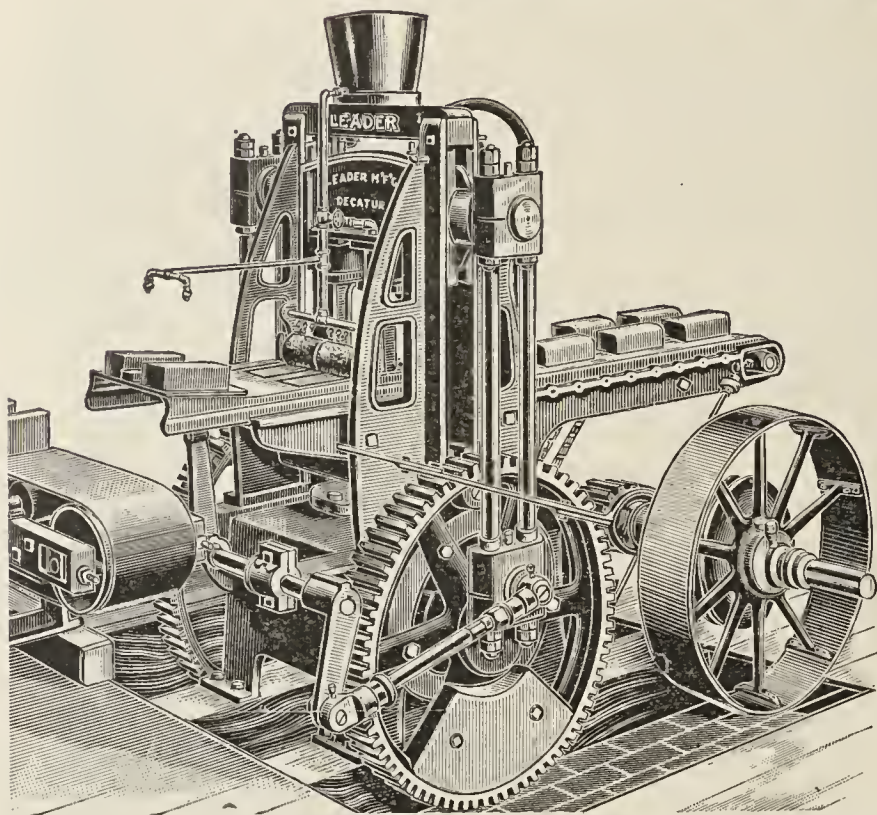


CAPACITY 40,000 BRICK PER DAY.  
WEIGHT 10,500 POUNDS.



# Leader Brick Machinery

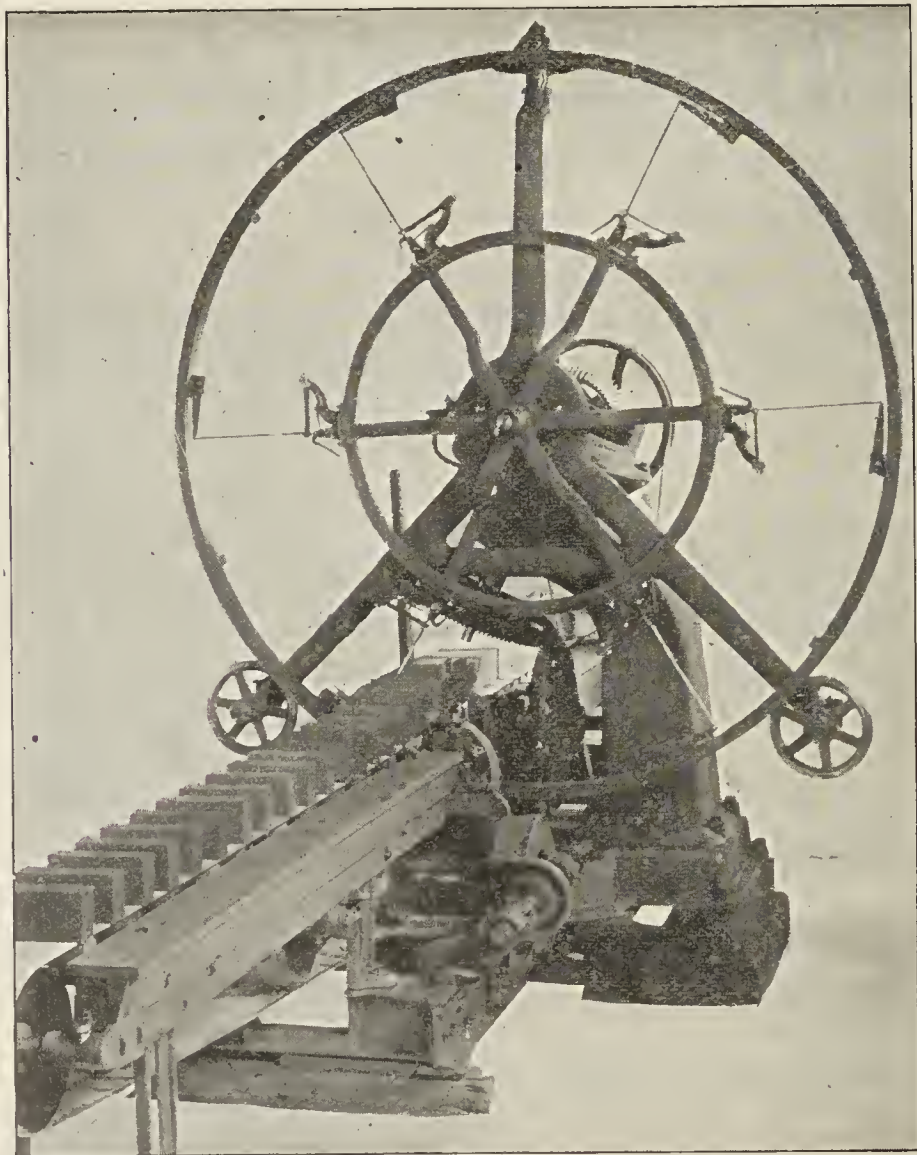
**Is Not Surpassed.**



Is cheaper in the Long Run  
and Costs no More at the  
Beginning than the other Kind.

The Leader Reprass is a double die machine of liberal dimensions, simple, convenient, effective, durable and light running, and is fully described together with our brick machines in sectional Catalogue number 101, which will be mailed free to any address.

**LEADER MANUFACTURING CO., Decatur, Ill.**



The Chambers Automatic Side-Cutter.

## Automatic Side-Cutter For Stiff-Tempered Brick Machines.

A ROTARY CUTTER, simple in construction, reliable and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

The machinery is above the dirt and all gearing encased.

MANUFACTURED and  
GUARANTEED. . . .

**Chambers Brothers Co.,**  
**PHILADELPHIA, PA.**



# Morrison's Latest Improved Kiln, **FOR BURNING BUILDING BRICK.**

**I**T has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

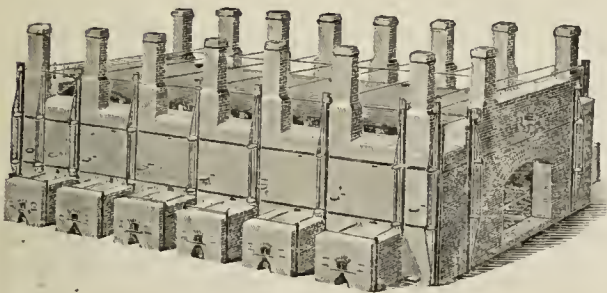
**R. B. MORRISON & CO.,**

*P. O. Box 335.*

*ROME, GA., U. S. A.*

## **The EUDALY <sup>DOWN DRAFT</sup> KILNS.**

**STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.**



These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

**The Eudaly Combination Furnace** burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

**The Eudaly Adjustable Steam and Air Blower** is something new and is especially adapted to the burning of culm or coal dust economically.

**The Eudaly System of utilizing the waste heat** from cooling kilns is one of the greatest fuel savers known.

**W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.**



# HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.

Horseheads Brick Co., N. Y., August 13, 1898.



Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,

R. G. EISENHART, Treas. and Gen. Man.



This kiln has now been in operation nearly two years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at \$2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

Address **H. HAIGH, Catskill, N. Y.**

## The Lehmann <sup>Portable</sup> <sub>Continuous</sub> Kiln, And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

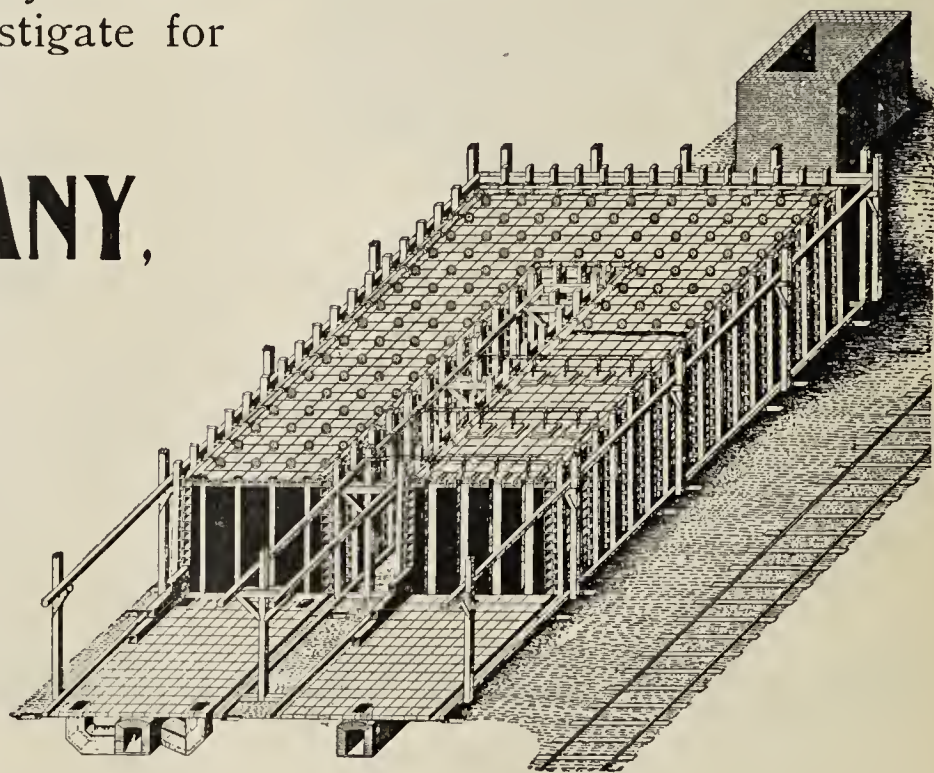
### F. LEHMANN & COMPANY,

Foot of West Wellington Street,

CHICAGO, ILL.

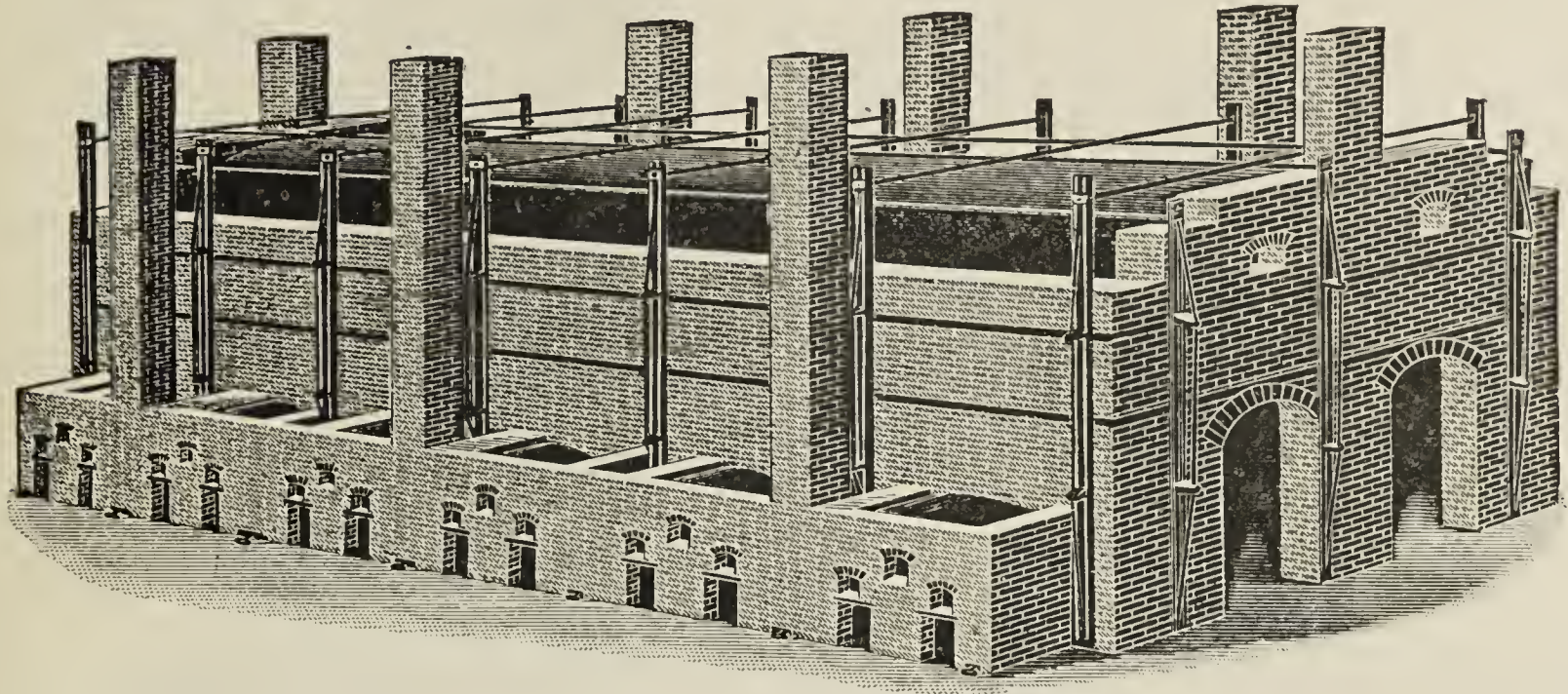
Kiln Builders, Consulting Clayworker Engineers,  
Plans and estimates furnished for Brick, Lime and  
Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has  
been in successful operation with crude  
oil during the last year and can be adapted  
to all kinds of fuel.





“One of the Greatest Inventions of  
Modern Times.” F. W. BUTTERWORTH,  
Asst. Gen'l Man. Marion Brick Works.



# The Swift SLACK COAL COKING-TABLE Furnace Kiln.

THE KILN which has a solid bottom, which is much cheaper to begin with, and is always in repair.

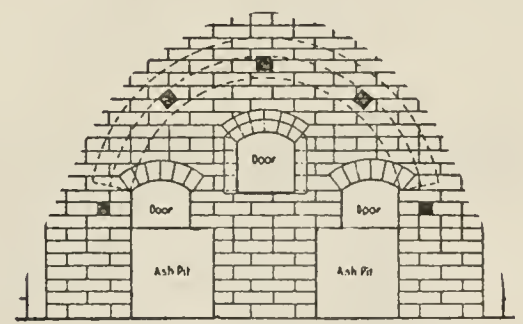
THE KILN that will save one ton of coal out of every seven tons you are using.

THE KILN which is so constructed that the heat is drawn from the bottom with Fan to dryer without danger of checking the cooling ware.

THE KILN that we will guarantee to burn any kind of clay ware with nothing but Slack Coal from start to finish of burn.

THE KILN that will burn Paving Brick in from 30 to 60 hours less time and not injure the ware, as the cold air is excluded from start to finish.

THE KILN that has the famous **Swift Coking-Table Furnace** attached to it; the furnace which is to-day being attached to all kinds of kilns—Up-draft, Clamp, Down-Draft, Round and Square, and also one continuous Kiln, has been re-modeled, and is giving entire satisfaction.



THE SWIFT COKING TABLE FURNACE.

## F. E. SWIFT,

Send for Catalogue.

Washington, Iowa, U. S. A.



# SEWER PIPE AND TILE MACHINERY,

## Our Specialty.

The First Machine of this Type  
was manufactured for Mon-  
tague & Co., Chattanooga,  
Tenn., November 1897. . .



The accompanying cut  
is from Photograph  
of Press Built.

DURING THE PRESENT YEAR  
WE HAVE BUILT THESE SIZES:

| 44 in. Steam Cylinder, | 20 in. Clay Cylinder, | 42 in. Stroke. |
|------------------------|-----------------------|----------------|
| 44                     | 20                    | 50             |
| 48                     | 22                    | 48             |
| 48                     | 24                    | 48             |
| 52                     | 24                    | 48             |
| 52                     | 20                    | 60             |

All the above are in successful operation and are positive  
witnesses of their Excellence.

FOR DESCRIPTION OF THIS

## Strictly Up-to-Date Machine

SEE LAST ISSUE, PAGE 363.

To make the Most Pipe

—AND—

To make the Best Pipe

**BUY** THIS MACHINE  
OUR DIES. . . .

LET US TELL YOU OF OUR

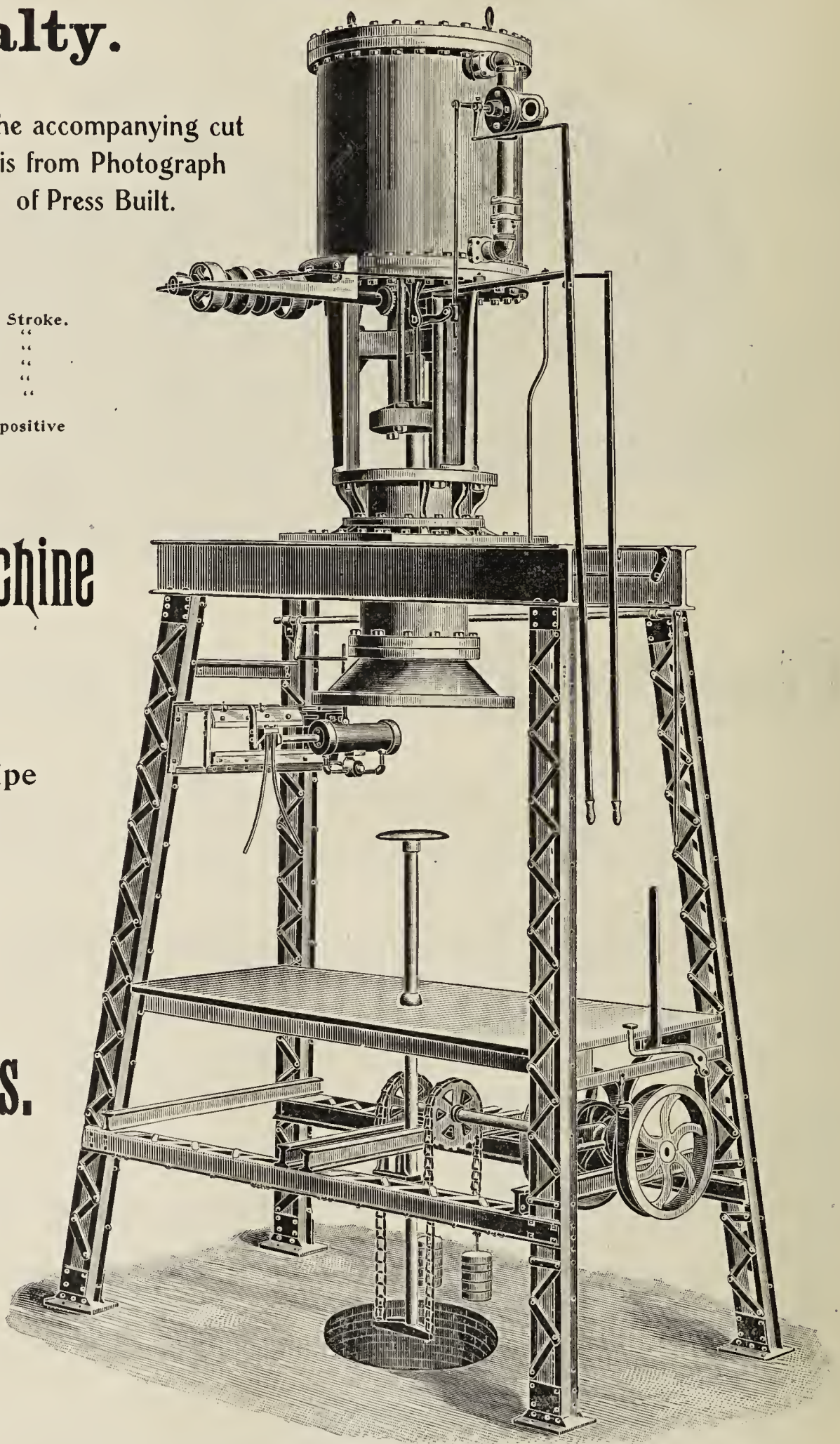
Steele Frame,  
Ball-Bearing

## DRY AND WET PANS.

DON'T EXPERIMENT  
WITH UNTRIED MACHINES.

"Be Sure You're Right, then Go Ahead."

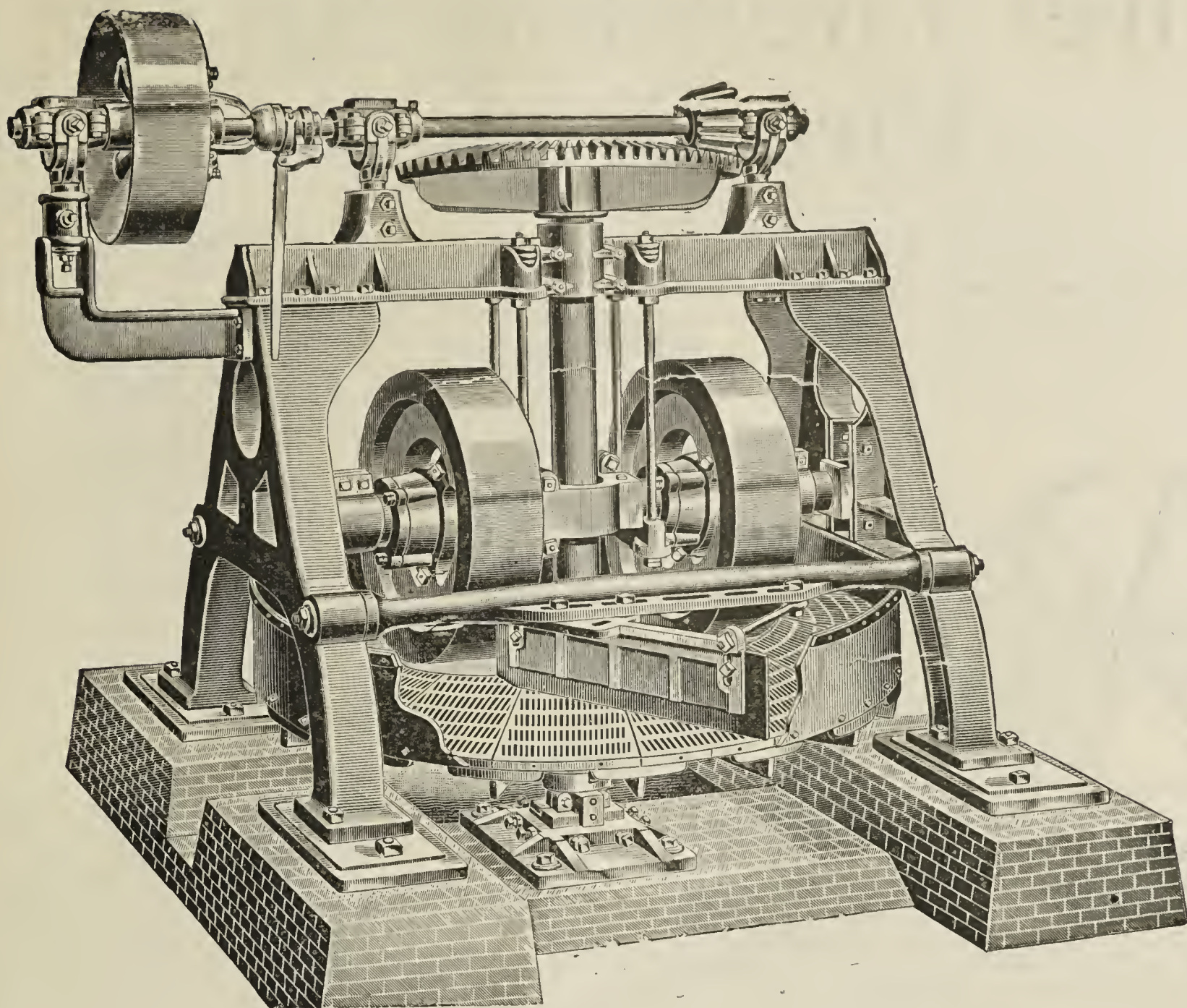
Our Pottery Machinery  
Is Unequalled.



MANUFACTURED BY

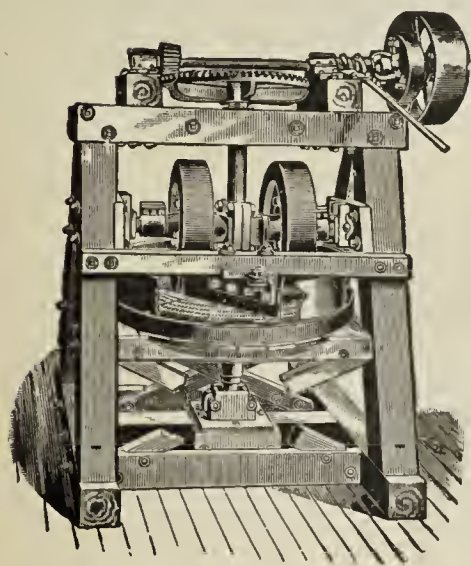
**TAPLIN, RICE & CO.,** AKRON,  
...OHIO.





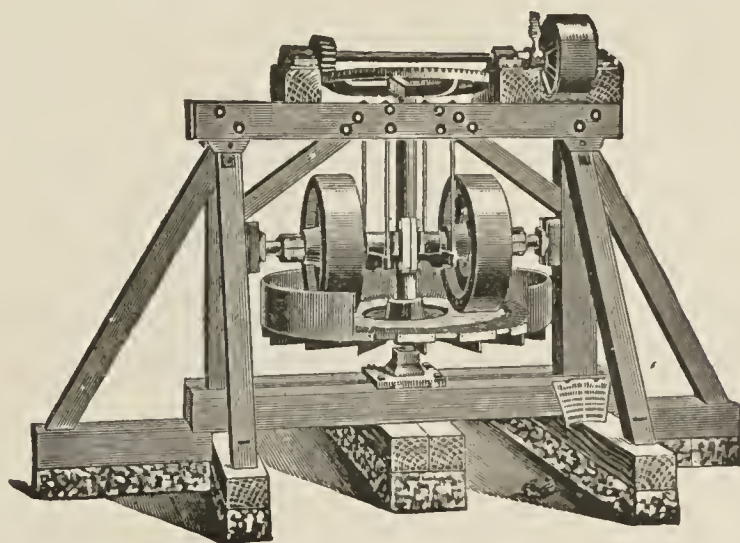
OUR SPECIALTY IS

**DRY PANS.**



IRON FRAMES,  
WOOD FRAMES.

~~~~~  
All Sizes and Price
to suit
Any Size Plant.
~~~~~



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

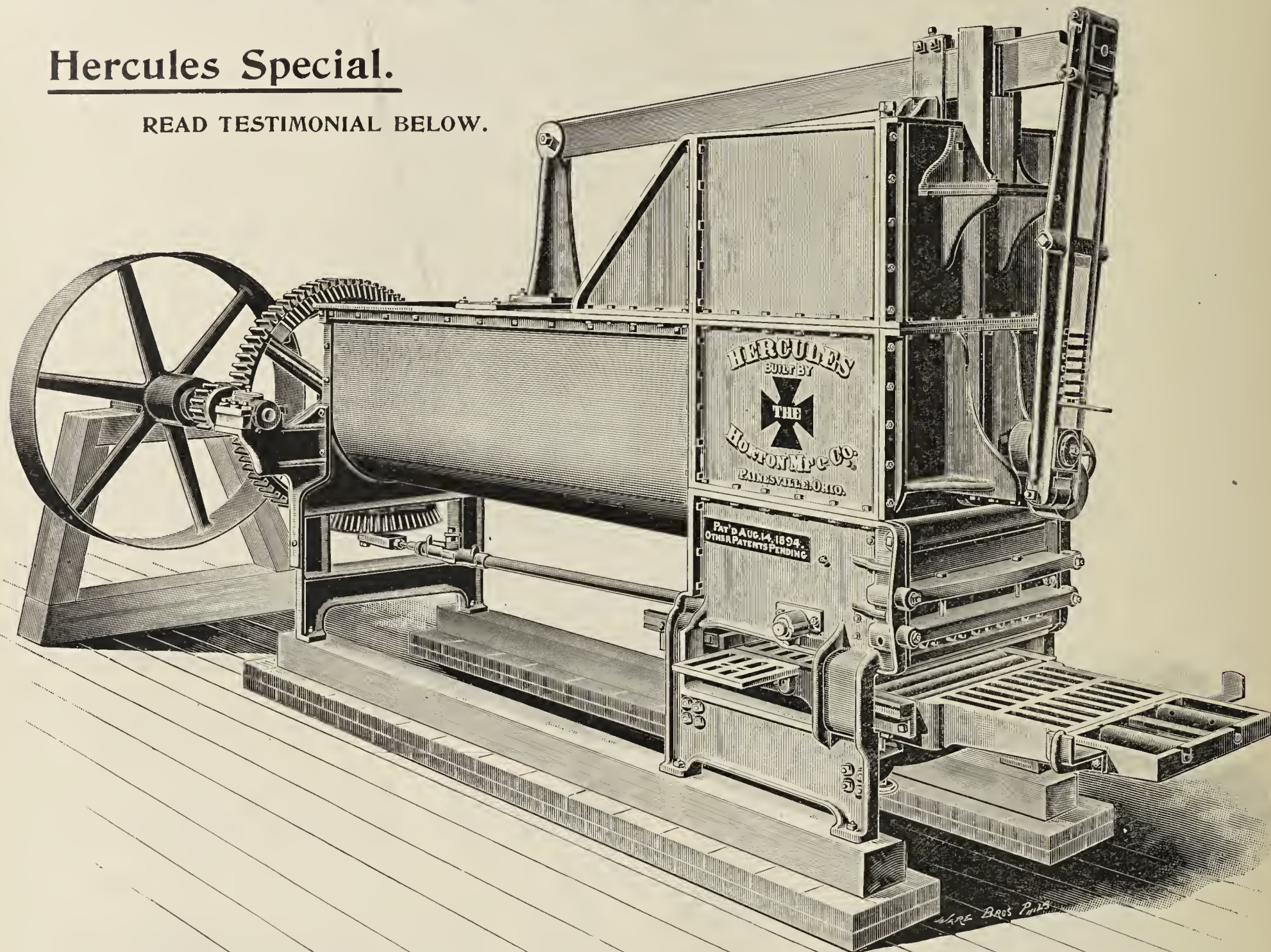
**FROST ENGINE CO.,** Galesburg, Ill.,  
U. S. A.



# Fire! Fire!! Fire!!! Fire=Brick Machine.

## Hercules Special.

READ TESTIMONIAL BELOW.



BOLIVAR, PA., Sept. 9, 1898.

HORTON MANUFACTURING Co., Painesville, Ohio.

Gentlemen:—We are pleased to state that the Special Hercules Fire Brick Machine which you furnished us works to our entire satisfaction and we are well pleased with it.

Yours very truly,

REESE HAMMOND & Co.

Per J. B. HAMMOND, Supt.

**HERCULES No. 2** for Sand-Molded Brick. Weight 14,800 lbs. Capacity 40,000 to 50,000 in 10 hours.

We make the largest line of Soft-Mud Machinery in the United States.

**The HORTON MANUFACTURING CO., Painesville, Ohio.**



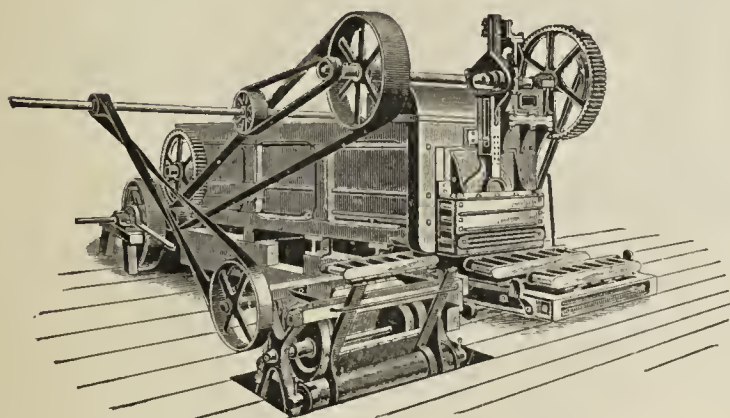
# DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

.. THE ..

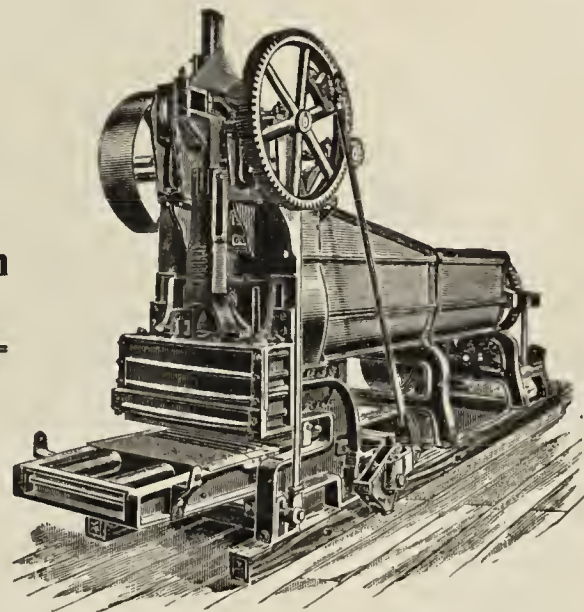
## POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood: Pug Mill.

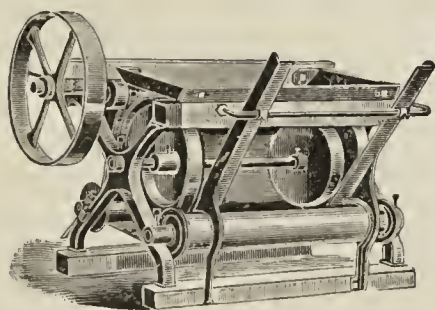
They have no equal  
for making Brick which  
have Clean, Sharp Cor-  
ners and Smooth  
Surfaces.



Iron Frame Pug Mill.

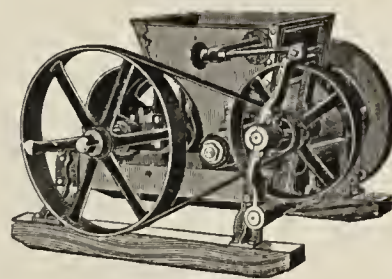
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



### Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



### Disintegrators,

Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

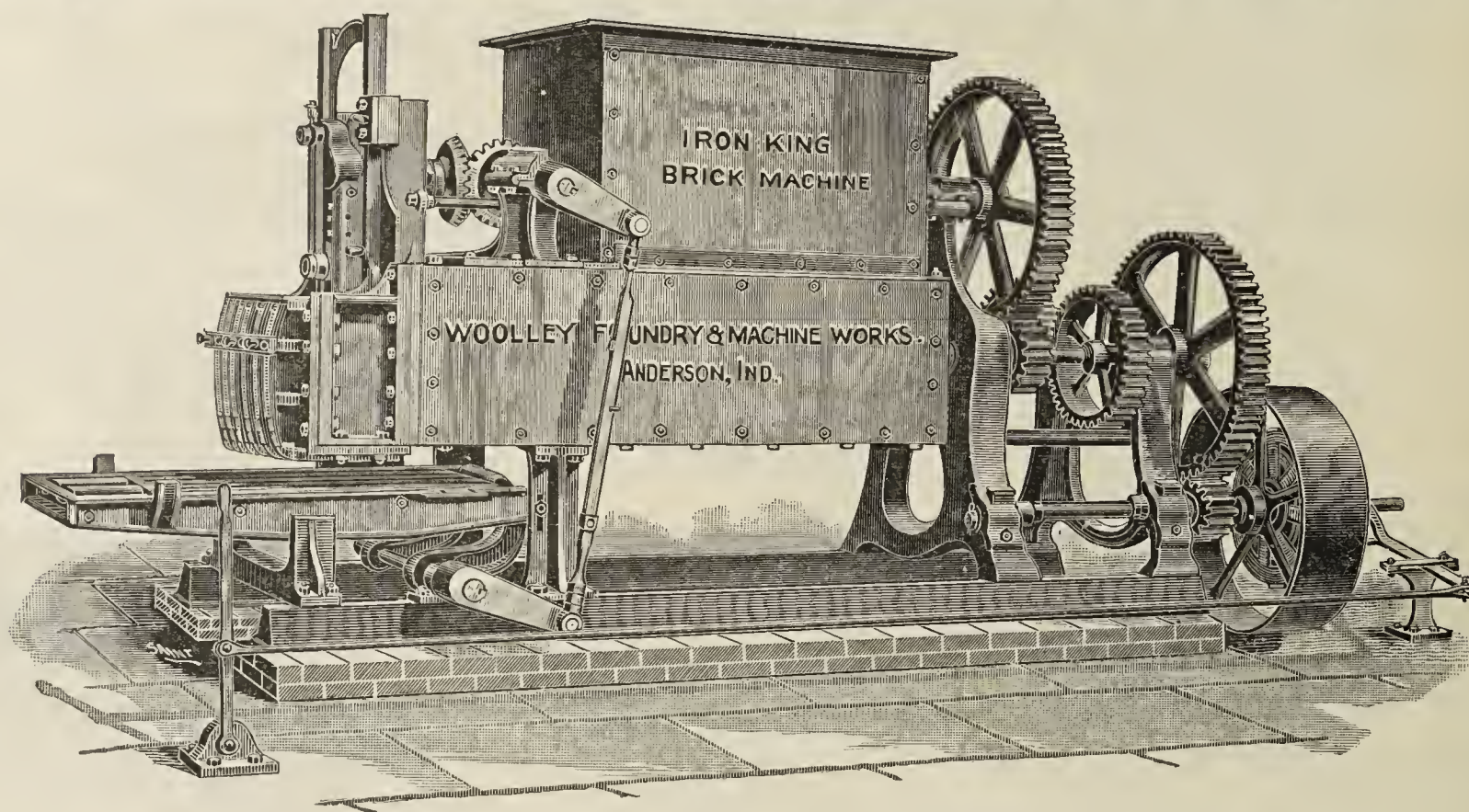
**C. & A. POTTS & CO.,** 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**



# SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “IRON KING” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

**WOOLLEY** DRY PANS,  
PUG MILLS,  
SLIP PUMPS  
and PRESSES

Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US  
PLEASURE TO QUOTE  
YOU PRICES. . . .

Mention the Clay-Worker.





# Rightness In Pan Making.

We manufacture Dry Pans in four sizes, viz: 5, 7, 8 and 9 feet in diameter. For grinding fire clay, shale, quartz, lime, spar, sand, ochre, calcine, grog, plaster, rock, plaster of paris, bones, coal, or any hard substance, these pans are most excellently adapted. Owing to the great screening capacity we claim that these pans will do more by twenty per cent than others.

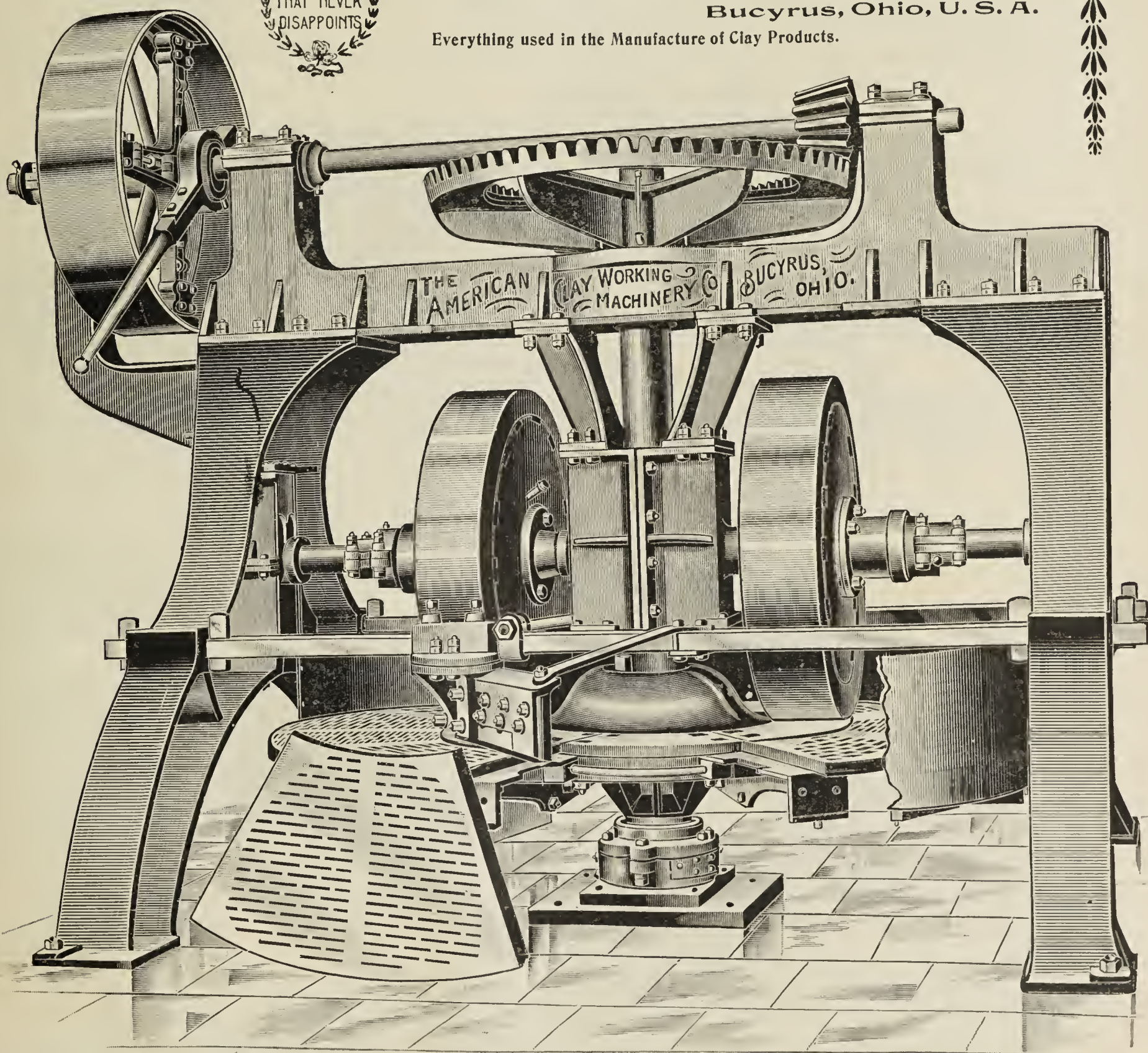
Built Right, Run Right. Great Weight, great Strength, great Screening Capacity. Frames Accurately Fitted. Every Joint Planed Square. Every Hole Correctly Drilled. Lock Nut on Each Bolt. Independent Mullers. Frictionless Bearings. Extra Heavy Gearings. Capacity 20 per cent Greater than any Other Pan Made.



## The American Clay-Working Machinery Co.,

Bucyrus, Ohio, U. S. A.

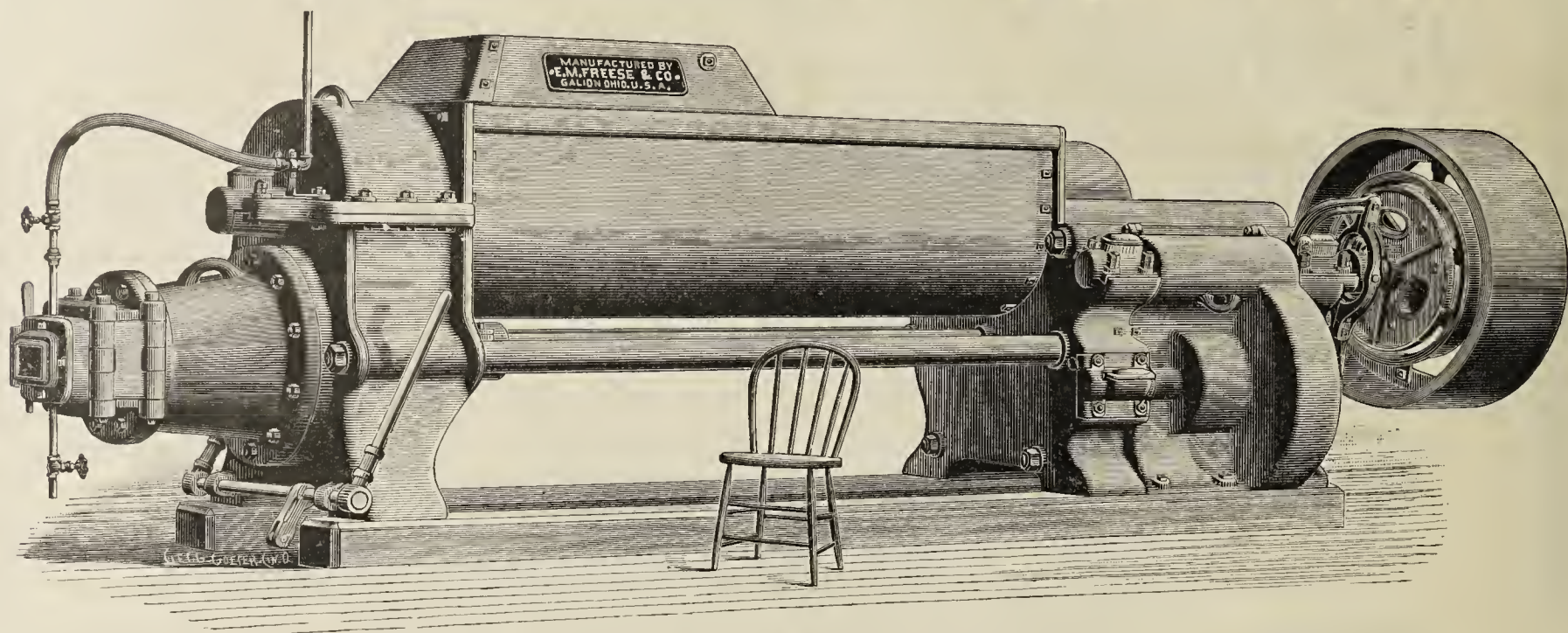
Everything used in the Manufacture of Clay Products.



NINE FOOT DRY-PAN. STYLE "F."

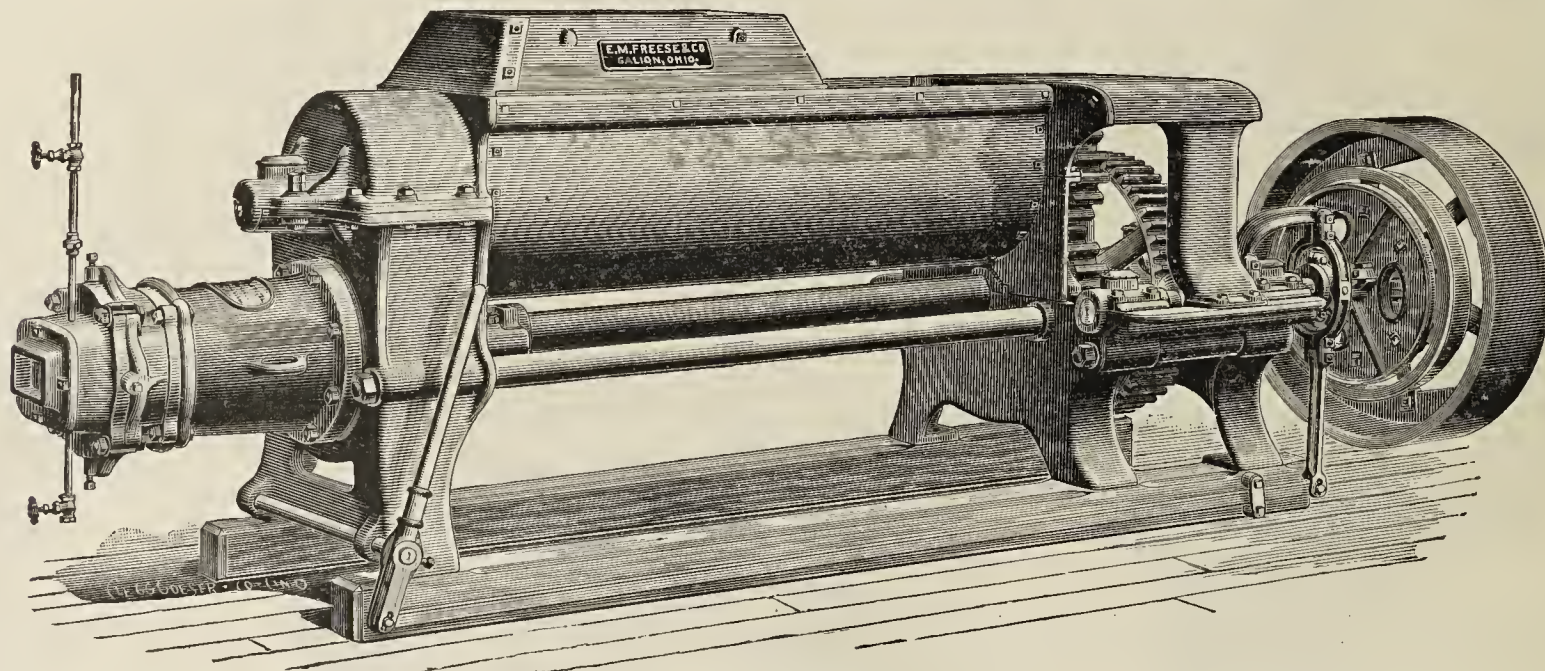


# The Original Union Brick Machines



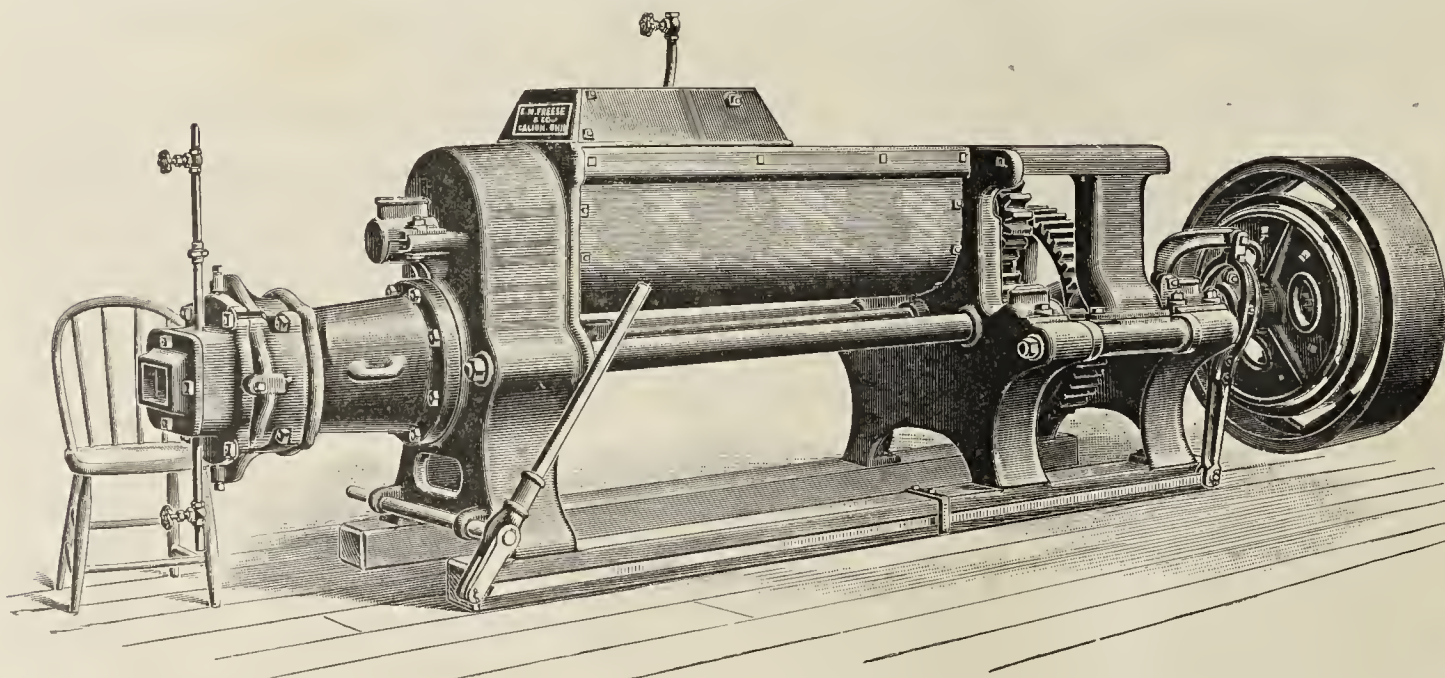
## SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



## No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



## No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

**E. M. FREESE & CO., Galion, Ohio.**

These Machines are  
NOT an experiment.

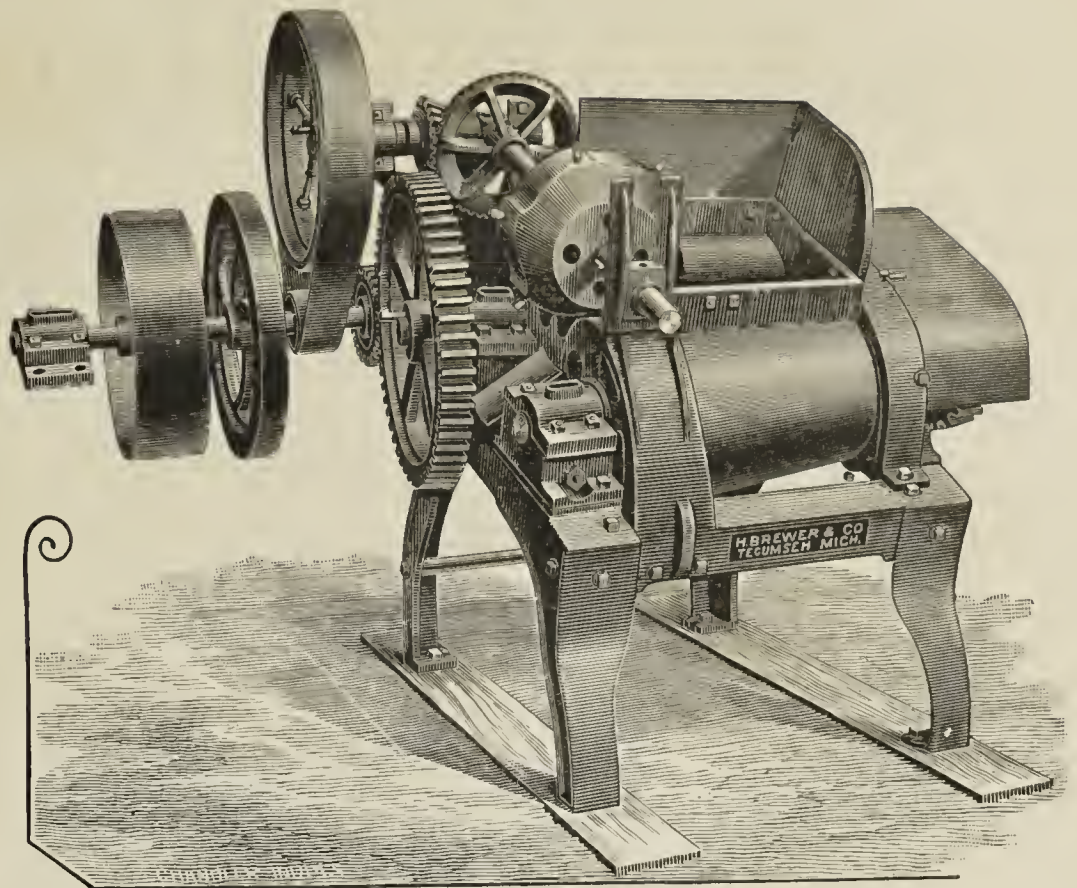
They are used in fif-  
teen States.

They are a SUCCESS  
Investigate them.

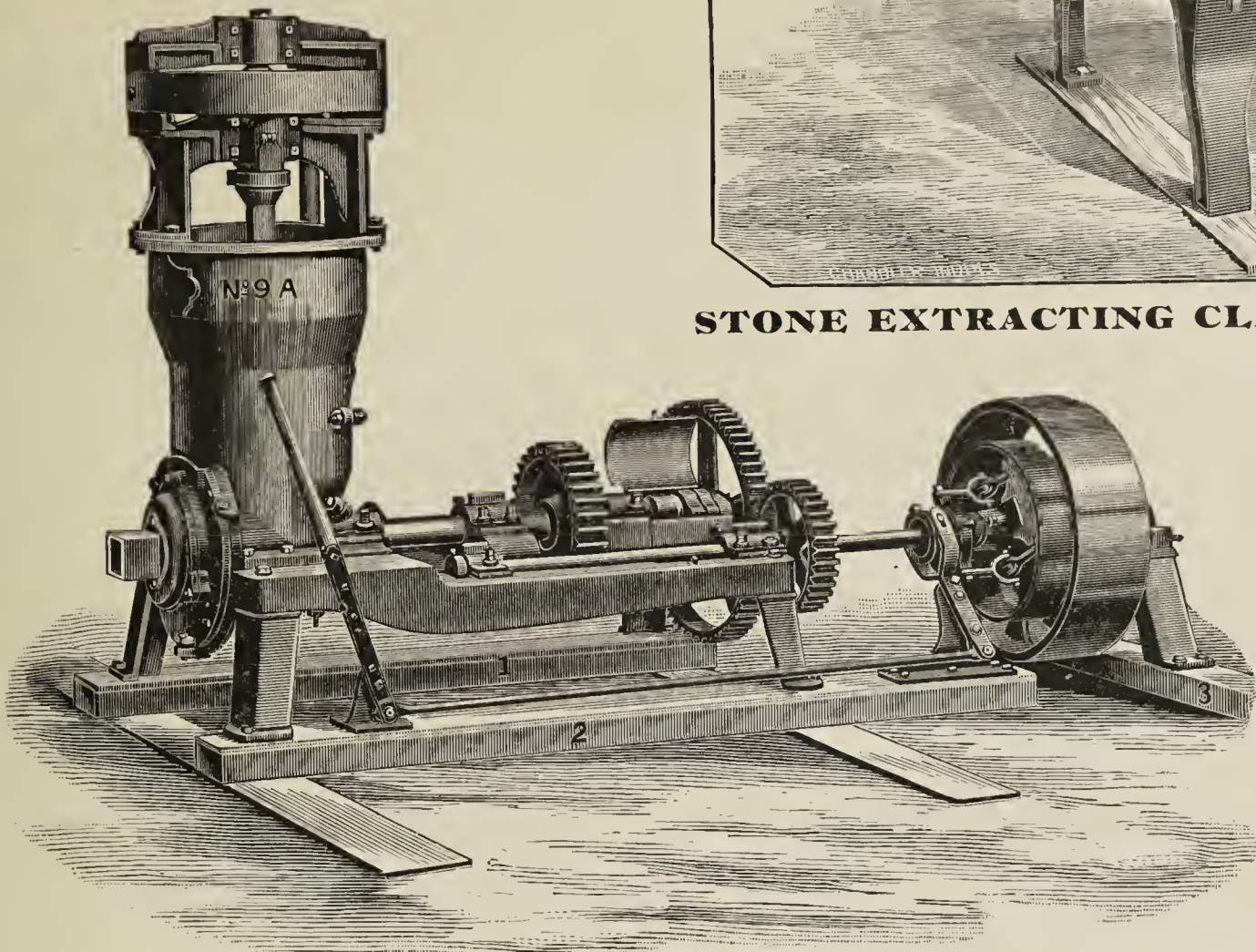
No separate Pug Mill  
required.



# Clay . . . . Working Machinery



STONE EXTRACTING CLAY CRUSHER.



No. 9 "A" BRICK MACHINE.

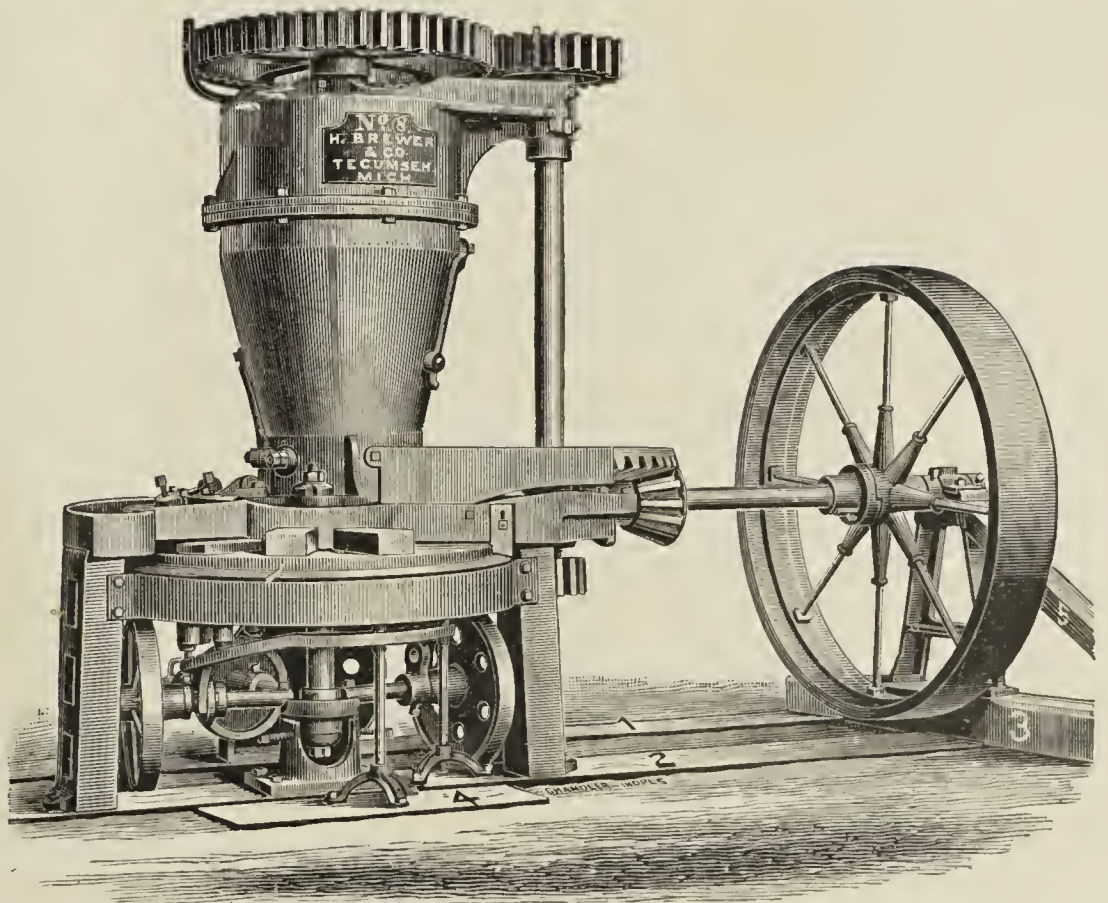
Complete  
Brick  
and  
Tile  
Outfits  
a Specialty.



Manufactured by

**H. Brewer  
& Co.,**

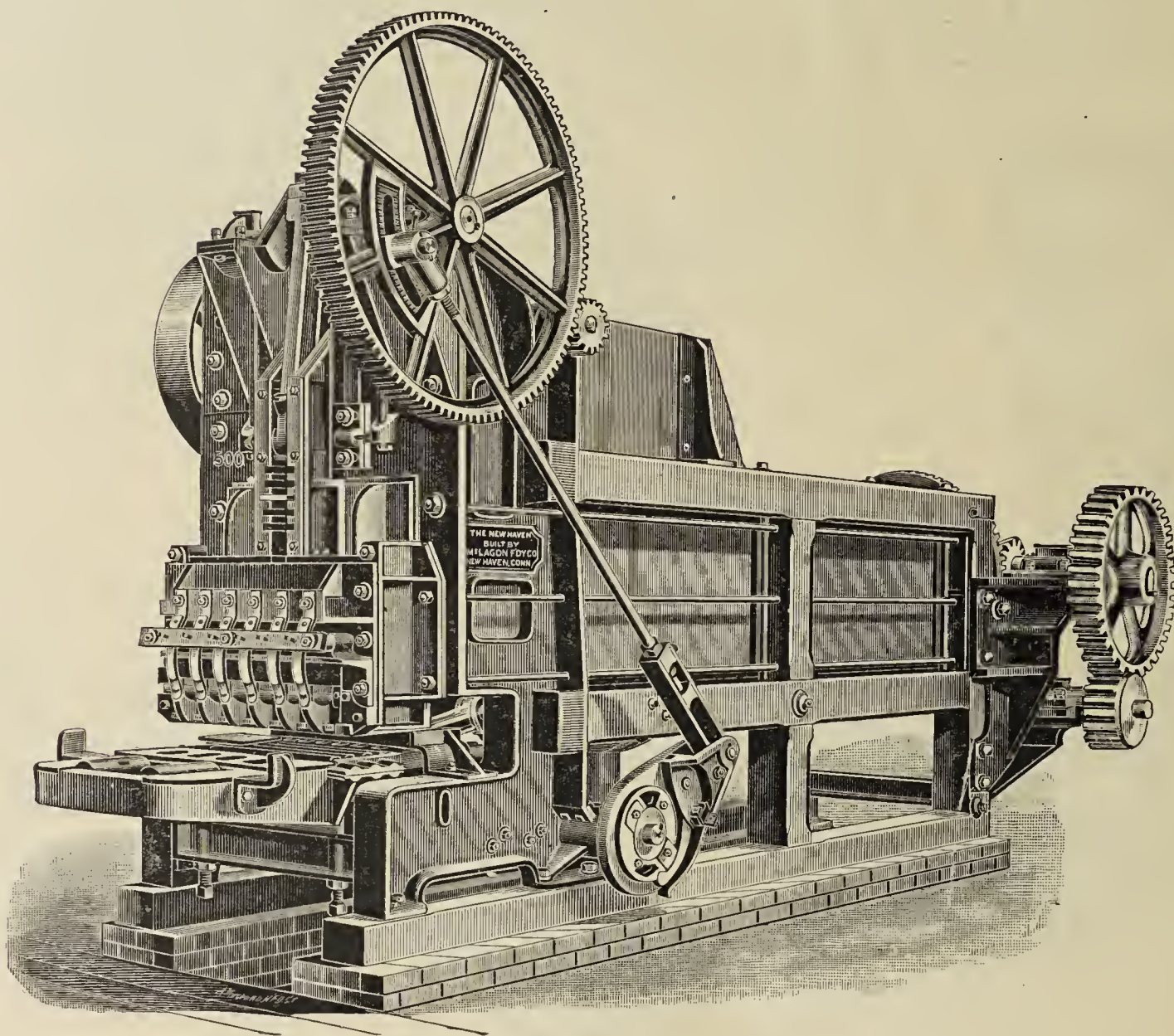
**TECUMSEH,  
. . . . MICH.**





# Another "New Haven" Record.

Three Seasons without Repairs,  
Except a few Tempering Knives.



HOLYOKE, MASS., October 18, 1898.

THE EASTERN MACHINERY CO., New Haven, Conn.

Dear Sirs:—In reply to your inquiry we can honestly say that your brick machine **has given entire satisfaction**, and we cheerfully recommend it to all brick manufacturers.

This is our **third season** with this machine and **we have had no repairs** except the furnishing of knives for shaft during this period.

Yours respectfully,

DANIEL O'CONNELL'S SONS.

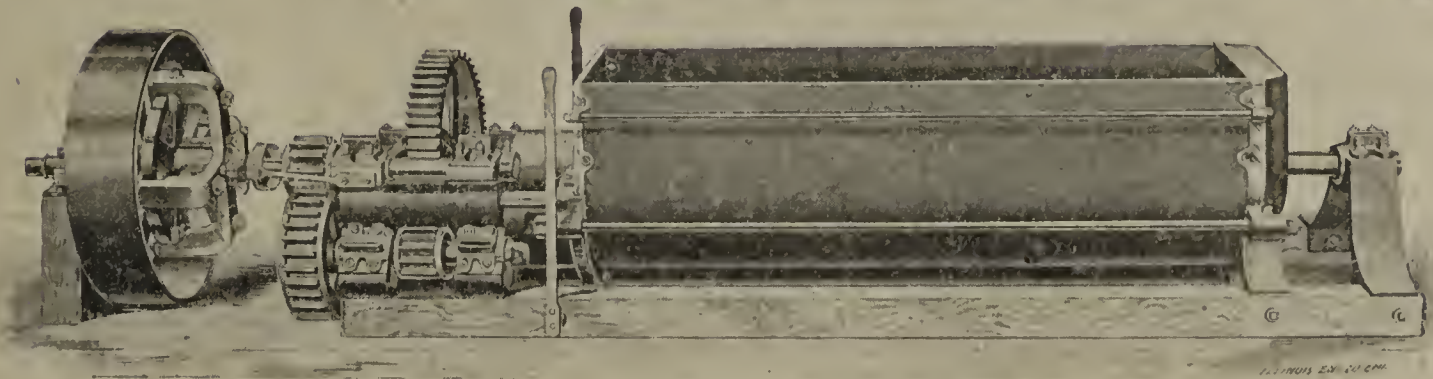
We Have Received Lots of Just Such Replies. —

**The Eastern Machinery Co.,**  
NEW HAVEN, CONN.



# The Wonder Clay Working Machinery

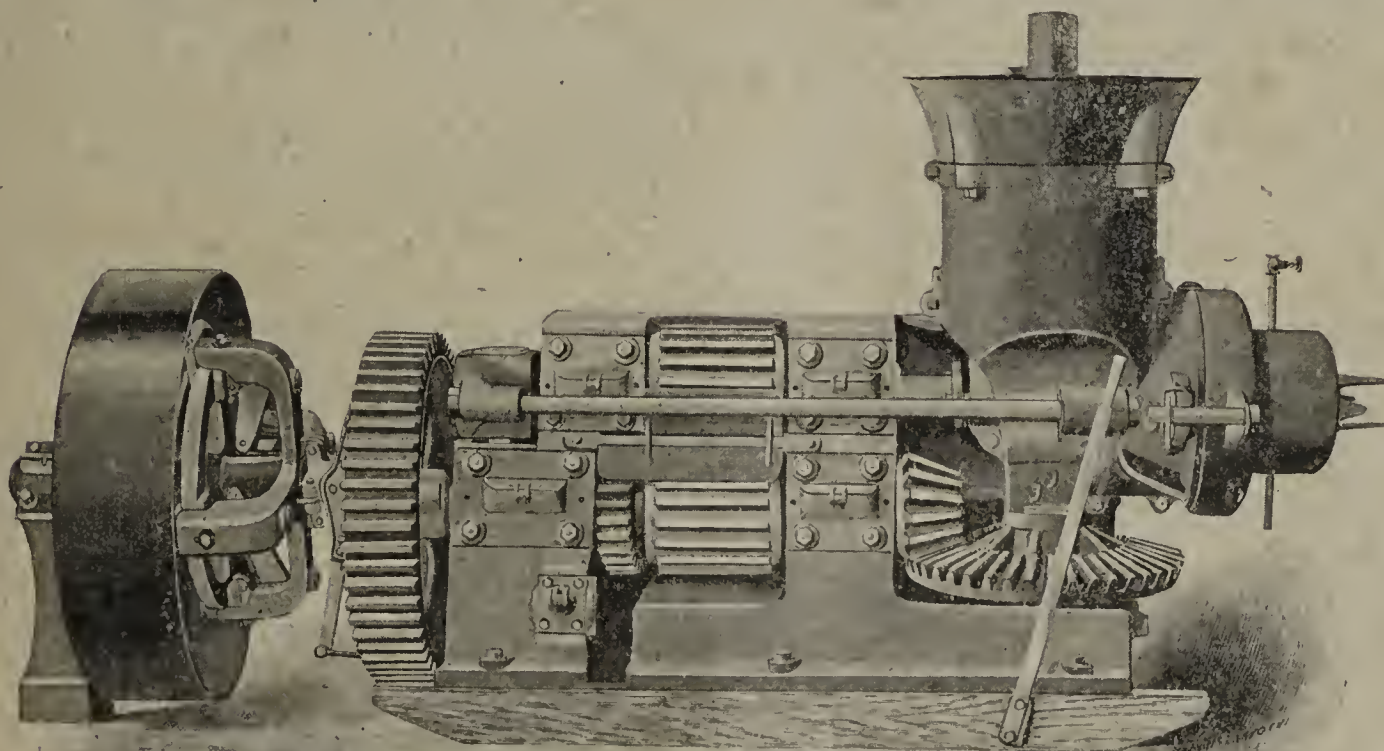
And a  
Few  
of  
its  
Friends:



Open Top Pug Mills of any size and capacity desired.

HENRY KNEALE, Montmorenci, Ind.  
W. H. LODGE, Monticello, Ill.  
E. F. FOX, Sheffield, Ia.  
DIXON-WOODS, Pittsburg, Penn.  
FRED A. BEARD, Ruby, Mich.  
M. C. MEIGS, Lafayette, Ind.  
ZEELAND BRICK CO., Zeeland, Mich.  
FRANK H. REID, Evanston, Cin., O.  
D. AND W. ROLLER, Kingsport, Tenn.  
LEXINGTON BRICK CO., Lexington, Ky.  
PETER BITZER, Louisville, Ky.  
W. H. STORMOUNT, Princeton, Ind.  
COLLINS BRICK CO., Grand Rapids, Mich.  
WINDFALL, MFG CO., Windfall, Ind.

FRED FLANDERS, Conover Station, Wis.  
NEEDHAM BROS., Miami, Ind.  
RIVERSIDE BRICK CO., DePere, Wis.  
CONKLIN-ARMSTRONG TERRA COTTA CO.,  
Philadelphia, Penn.  
TAYLOR BROS.' DON VALLEY BRICK WORKS,  
Toronto, Canada.  
W. H. CARTER, Appleton, Wis.  
FRANKLIN WHITCOMB, Des Plains, Ill.  
NORTHWESTERN BRICK AND FIRE PROOFING CO.,  
Minneapolis, Minn.  
MONTREAL TERRA COTTA LUMBER CO.,  
Montreal, Canada.  
J. L. BURNHAM & SONS, Milwaukee, Wis.



If you  
Want  
the  
Best  
Brick  
and  
Tile  
Machinery,  
Don't  
Fail  
to get  
Our  
Prices.

Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

## Wallace Mfg. Co.,

CHICAGO AGENTS:  
Chicago Brick Machinery Co., Chicago, Ill.

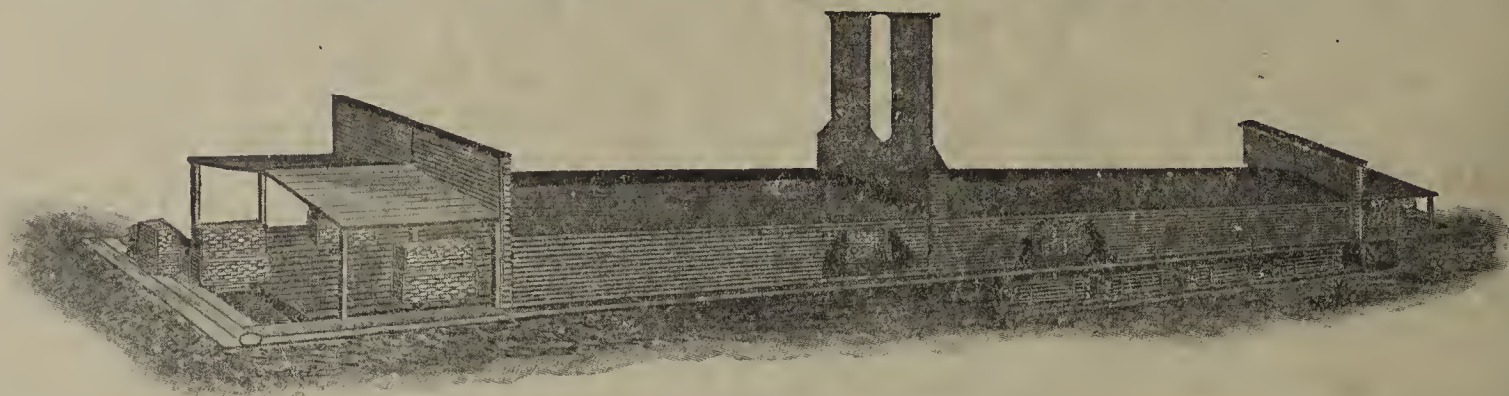
FRANKFORT, IND.

(More Names on Page 473.)



**A. F. BARRON,** Patentee and  
Builder of

# The Chicago Iron Clad Dryer and Barron's Tender Clay Dryer.



THE BARRON TENDER CLAY DRYER.

This is a practical arrangement for drying all tender clay products that requires very careful drying. Each tunnel is divided into two chambers, the front being the preparatory, or tempering room, the rear the finishing chamber.

The air of tempering room can be maintained at any desired temperature and impregnated with necessary moisture to hold texture of clay products in uniform condition from centre to surface while process of setting, solidifying and warming up is progressing—preparatory for finishing course through rear chamber.

**A. F. BARRON,**

Successor to WOLFF DRYER CO.,

Room 303, 358 Dearborn Street,

CHICAGO, ILL.

*Now is the Time to Place Your Order for a Dryer.*

INVESTIGATE  
THE CLAIMS  
MADE FOR

## The "A. B. C." Progressive Brick Dryer.



SATISFACTORY OPERATION,  
ECONOMY OF POWER.

BOOTH & FLINN, Contractors, Pittsburg, write:

"We have in use at our brick yards, two (2) of your Improved Fans and Heaters for brick drying, and they are giving us good satisfaction, and we find they reduce the cost of drying brick considerable, and we take great pleasure in recommending them."

**A** AMERICAN  
**B** BLOWER  
**C** COMPANY,  
**D** DETROIT.

Send for Catalogue.























